

July 9, 1940.

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PAPER UNIT DISPENSING DEVICE

Original Filed Sept. 16, 1935

3 Sheets-Sheet 1

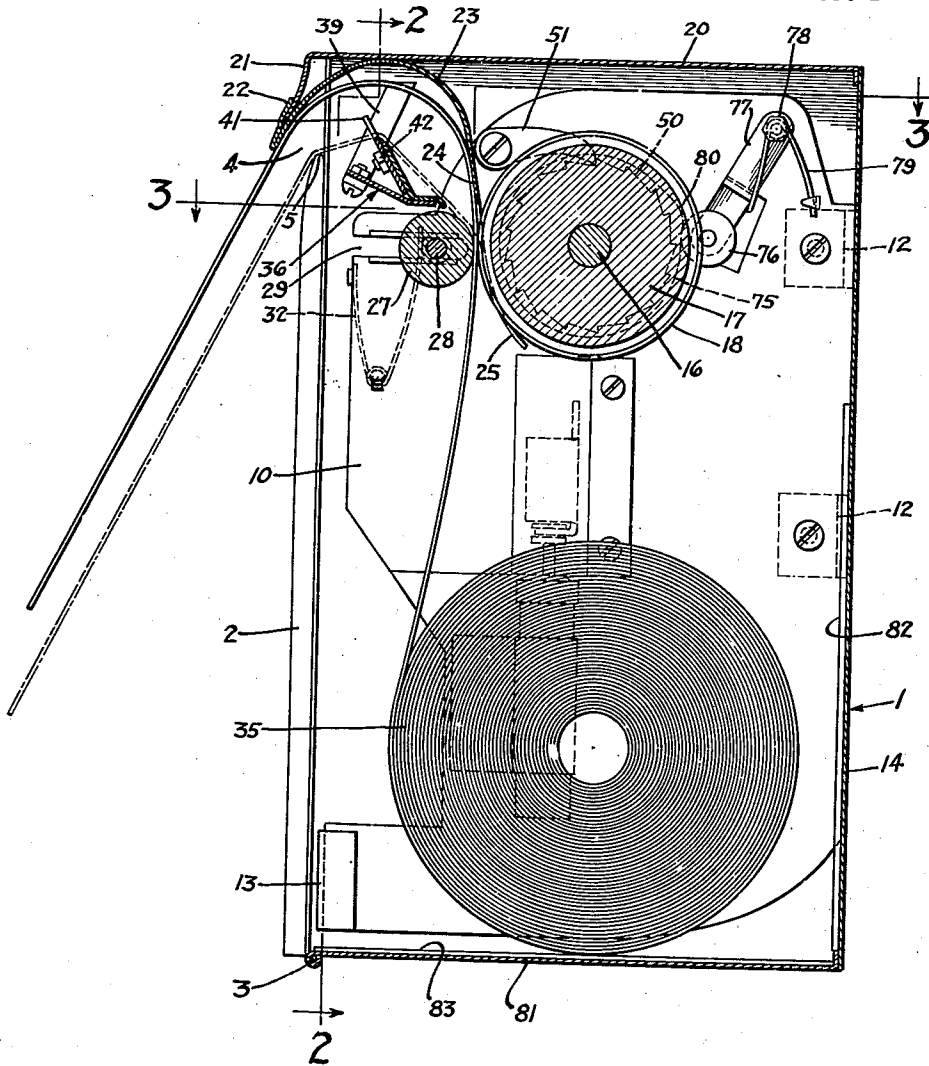


FIG. 1

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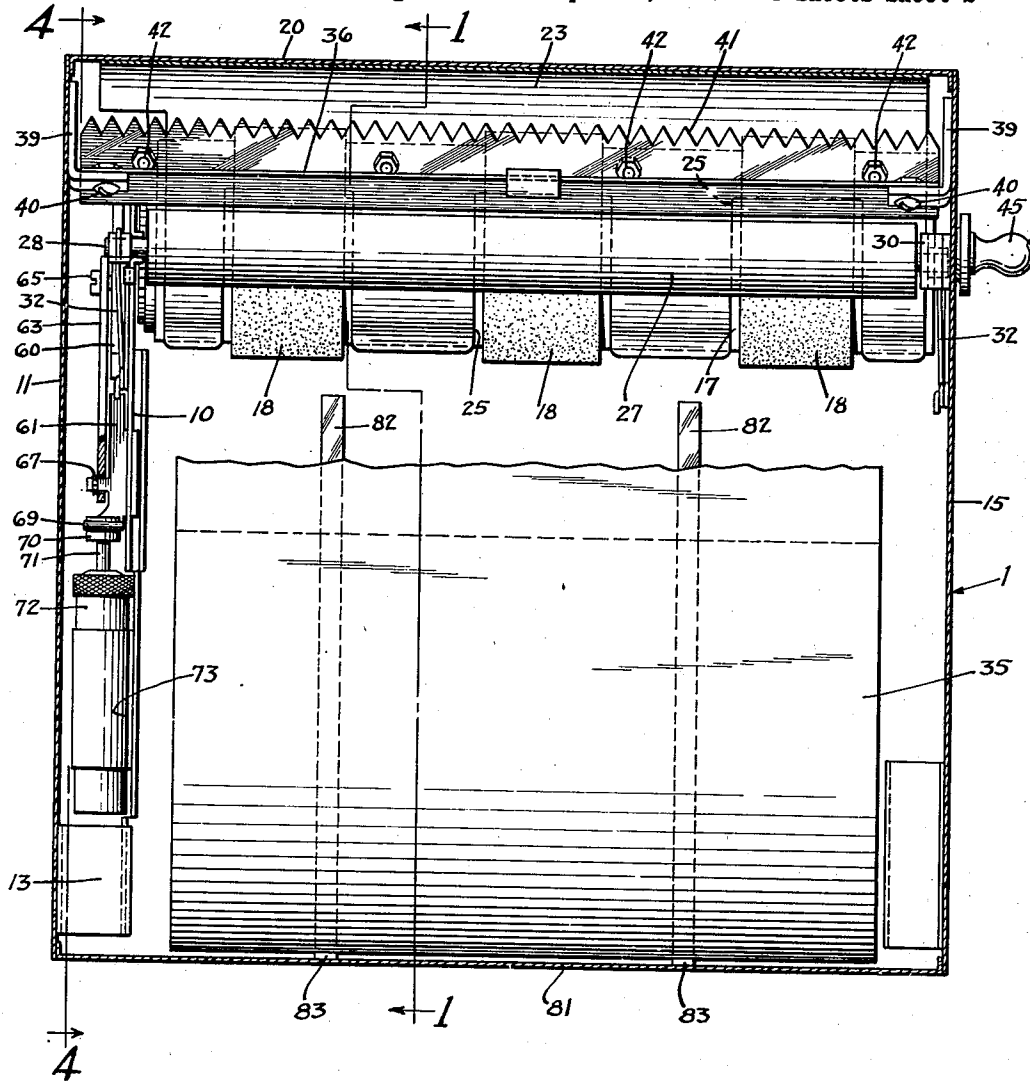


FIG. 2

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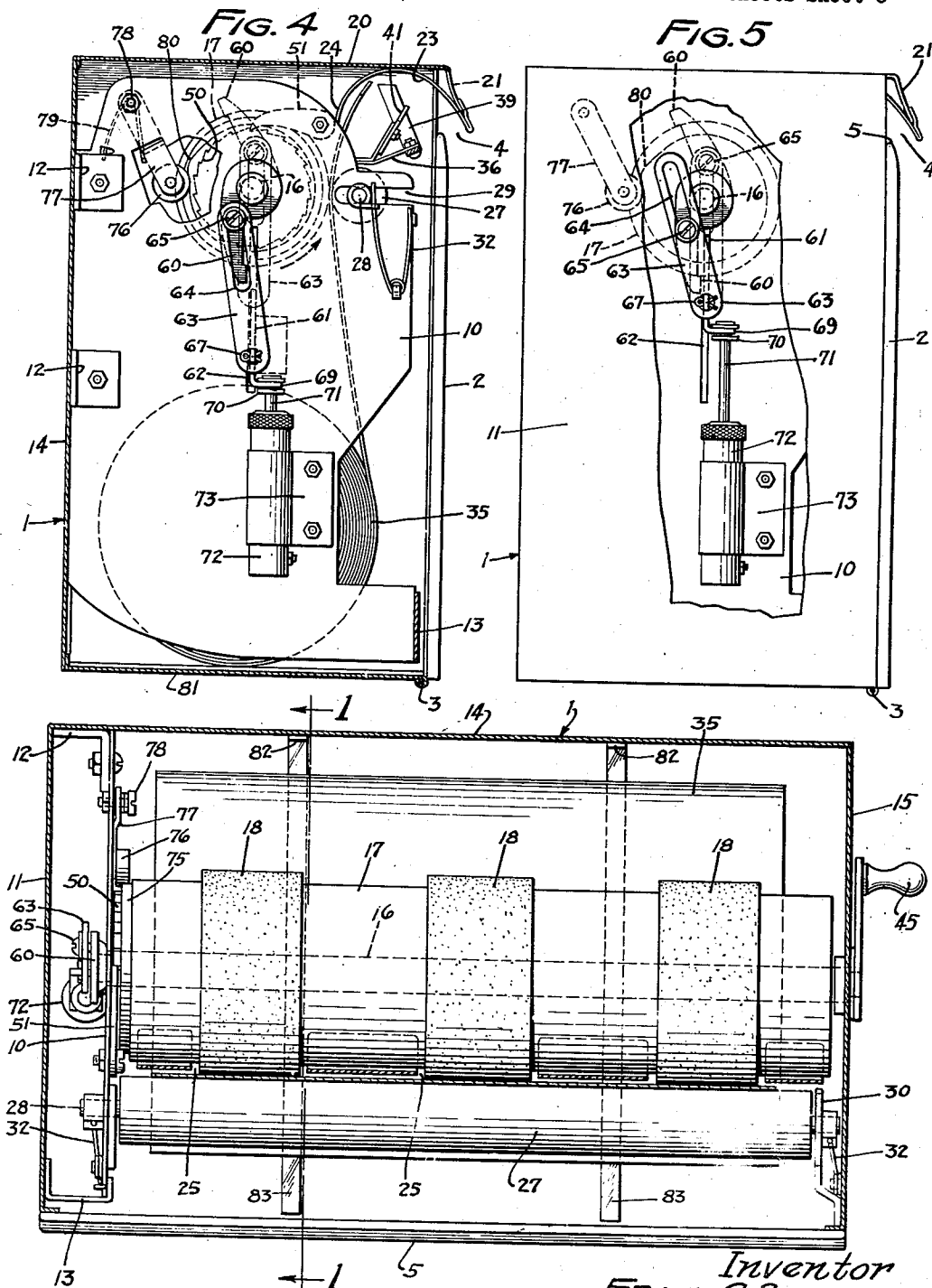


FIG. 3

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UNITED STATES PATENT OFFICE

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PAPER UNIT DISPENSING DEVICE

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11 Claims. (Cl. 164—84.5)

This invention relates generally to improvements in dispensing cabinets, particularly adapted for dispensing paper drying units.

An important feature of this invention relates to a paper towel dispensing cabinet of a type in which the paper is separated from the supply by a downward pull. Cabinets of this general type are used in public washrooms, in conjunction with an interfolded type of sheet toweling. It is the object of this invention to use the down-pull to separate a toweling length from a supply roll of paper toweling. Means is provided to obtain delivery of a predetermined length of paper to an accessible position, whereat it is separated by down-pull, thus providing not only a more economical substantially less costly form of paper drying unit, but dispensing it in a manner which does not require change of the down-pull habit, engendered by the use of the aforesaid down-pull interfolded-sheet type of dispensing cabinet.

Another important object is to combine with any down-pull scheme, or with a down-pull tear-off scheme, means for preventing delivery of toweling for a predetermined time period following each manual severing operation, whereby further economies result.

Features of the invention include: a dispensing cabinet in which the paper is dispensed from the upper part of the cabinet; means for causing the paper to be delivered in an outstanding and easily accessible position for grasping and spaced from and opposed to the front of the cabinet, and utilizing the curl of the paper resultant from rolling the same, for causing the paper to assume such an outstanding and easily accessible position, means by which the paper is severed by the user by a down-pull thereon; mechanism for limiting the degree of feed of the paper toweling, to dispense only a predetermined amount at a time; means for preventing feed for a predetermined period following delivery of a length to an accessible position; simplification of the construction by the use of a stationary rather than a moving or driven cutter or severing device; a simple, relatively inexpensive device having all the advantages desired in a device of this type; and all the details of construction, along with the broader ideas of means inherent in the disclosure.

Objects, features, and advantages of the invention will be set forth in the description of the drawings forming a part of this application; and in said drawings

Figure 1 is a vertical transverse section, taken

on lines 1—1 of Figures 2 and 3, with the drying unit length positioned to be easily grasped and easily severed or separated by a down-pull;

Figure 2 is a vertical longitudinal section, taken approximately on line 2—2 of Figure 1, with the timer positioned as before setting;

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

Figure 4 is a vertical section taken approximately on line 4—4 of Figure 2, with the timer positioned as before setting; and

Figure 5 is an elevation showing the timer positioned as after setting, and with the feed locked against feeding action.

In the drawings, numeral 1 generally indicates the outer casing of a cabinet, having a front door 2 hinged at the bottom as at 3 and thus adapted to swing downwardly. The cabinet has a delivery orifice 4 adjacent its top. The lower side of this orifice is formed by the upper edge 5 of the door 2.

A vertically disposed plate 10 is spaced inwardly from one side wall 11 of the cabinet, and is secured by suitable brackets 12 and 13 respectively to the rear wall 14 of the cabinet and to the side wall 11. This plate defines with the side wall 11 a narrow vertical chamber extending from front to back and substantially from top to bottom of the cabinet, and a larger chamber in which the paper supply roll and feeding and severing means are housed.

Rotatably journaled in the plate 10 and in the opposite side wall 15 of the cabinet is the shaft 16 of a feed roll 17 provided at intervals throughout its length with friction-feeding rings 18 of suitable material, and larger in diameter than the roll so as to project circumferentially therebeyond.

The knife is so placed in relation to the upper edge of the delivery opening and to the measuring roll that no matter how the user pulls on the paper, whether down, straight out or up, the paper assumes tear-off relation with the knife. When the edge of the knife is serrated or toothed and with this arrangement, it is impossible to pull more than the allowed amount of paper out of the cabinet. As soon as one pulls the paper it comes in such frictional relation with the knife that the user is forced, if he wishes more paper, to obtain it operating another device manually, in this instance by turning a crank. The moment he starts to pull on the toweling it tears off.

The top wall 20 of the cabinet 1 has a forwardly and outwardly directed down-turned portion 21, the lower edge of which is received by a socket

formed in part by a forward rebent portion 22 of a sheet-directing guide. This guide has an arched top portion 23 and a skirt portion 24 extending downwardly in front of the feed roll 17 and lying close to the roll, and having slots or cut-outs 25 forwardly through which the rings 18 extend, as best shown in Figures 1 and 3.

Cooperative with the feed ring 18 is a presser roll 27 having a shaft 28 journaled in open end slots 29 respectively of the plate 10 and bracket 30, the bracket 30 being secured to the cabinet wall 15, as best shown in Figure 3. This roll 27 is yieldably urged toward the feed roll 17 and rings 18, by springs 32 acting on the ends of the shaft 28. The paper supply roll is indicated at 35 and from the forward side of this roll the paper is passed upwardly between the roll 27 and the feed rings 18 and against the forward side of the apron 24 and then to the position shown in full lines of Figure 1.

Above the feed presser 27 and forwardly of the roll 17 and under the arch 23 of the guide is arranged a horizontal support generally indicated 36 composed of suitably bent and connected plates. This support is supported by hangers or brackets 39 (see Figure 2) secured to the cabinet sides 11 and 15. The support 36 is detachably secured to the brackets by suitable screws 40. One of the plates of this support carries a toothed knife 41 which is secured to the support by means of nuts and bolts generally indicated at 42, the severing edge of the knife is faced upwardly, and the knife is arranged in opposition to and near the delivery opening 4. The feed roll shaft 16 is provided with an operating crank 45, and after crank-feeding of the paper to the position shown in full lines in Figure 1, the paper is pulled by the user, downwardly to the position shown in dot-and-dash lines of Figure 1 against the toothed tear-off knife, and is thus severed.

The bend portion of the part 22 of the guide apron forms the upper side of the delivery opening and the upper edge of the door forms the lower side of this delivery opening. This upper edge of the door is suitably rounded to reduce friction.

To prevent operation of the feed roll in the wrong direction (see dotted lines of Figure 1), a ratchet wheel 50 is provided and placed at one end of the roll and with this ratchet wheel is engaged a pawl 51, see also Figure 3.

Another feature of the invention, in combination with the down-pull scheme, and also specifically in combination with the tear-off knife, is the means for feeding a predetermined amount or length of toweling and preventing feed for a predetermined time period following each feeding operation. Referring to Figures 4 and 5: A stop arm 60 is fixed to the shaft 16 at a point between the plate 10 and the wall 11 of the cabinet. This arm acts as a rotative stop and is associated with a sliding stop having the form of a plate 61 suitably slidably operably guided in slot 62 of plate 10. The two steps are connected by a link 63 having a slot 64 through which passes a pin 65 thus slidably and pivotally securing the link to the stop arm 60. The other end of the link is pivotally secured to the plate 61 and in this instance is held by a split key 67.

When the roll 17 is rotated in direction of the arrow shown in Figure 4, the arm also moves in that direction and after its lower end has passed to the right of the upper end of the slide stop 61 this stop is raised by means of the link, and

after one complete rotation of the roll the parts assume the position shown in Figure 5 in which the plate 61 prevents further rotation of the feed roll.

Another feature of the invention, in combination with the down-pull type of dispensing device, is the use of a timer. The stop mechanism is old and I do not claim it per se. I do claim, however, to be the first to apply any kind of a time stop mechanism to a down-pull type of paper towel dispensing apparatus. In the present embodiment, the timer is adapted to gradually move the stop plate 61 from its position shown in Figure 5 again to the position shown in Figure 4, thus preventing feed of paper for a predetermined time period following feeding. The part 61 of the stop mechanism controls the timer and both are controlled by, and in turn control, the feed roll. For this purpose, the lower end of the plate 61 is bent laterally as at 69 and is operably engaged with a grooved head 70 of the timer stem 71 of a dashpot type of timer. The barrel of the timer is indicated at 72, this barrel being suitably held by a bracket 73 to the outer side of the plate 10. This type of timer is well known in the art and no further description of it seems necessary. Herein it is merely a symbol of timing means in the general combination.

The stem 71 when pulled to the position of Figure 5 and released moves downwardly by gravity to assume, at the end of the time period, the position shown in Figure 4, thus moving the element 61 from the path of the element 60 to allow another feeding-out operation of the feeding mechanism.

Operation

Referring to Figures 1 and 4, and assuming the upper end of the paper to be in the position shown in Figure 4: The operator grasps the crank 45 and rotates the feed roll in direction of the arrow. The roll is given one complete rotation and as a result the paper is fed to a position shown in full lines in Figure 1. During this operation, the arms 60 and 61 move from their positions shown in Figure 4 to that shown in Figure 5, the link acting to raise the timer stem. The position of the arm 60 and the link at the upper limit of this raising movement is shown in dot-and-dash lines in each of Figures 4 and 5. At the end of this complete rotation of the feed roll 17, timing begins and at the end of the time period the stops again assume the position shown in Figure 4. At the end of the feed-out operation, the user pulls the towel downwardly to the position of the dot-and-dash lines of Figure 1 whereupon it is severed by the knife from the remainder of the paper web.

In order to avoid friction between the slide element 61 and the arm 60 after the parts reach the stop position (which friction would interfere with timer operation), means is provided to back-off the element 60 to the position shown in Figures 4 and 5. To this end, a cam 75 is arranged at the end of the roll between the roll and the ratchet wheel 50 and with this cam is engaged, see Figure 1, a roller 76, journaled on an arm 77 pivoted as at 78 to the plate 10. Spring 79 urges the arm and roll against the cam and the cam is provided with a projection 80 which is so arranged as to engage the roller and move the roller slightly against the action of the spring. The spring then reacts against this projection to rotate the feed roll in a direction opposite to that shown by the arrow in

Figure 4, to the position shown in Figure 5 wherein the arm 60 is spaced from the slide 61 and the latter is free from any frictional contact with the arm 60 so that it may travel downwardly under action of the timer.

The supply roll 35 bridges and rests upon narrow friction-reducing strips, a pair 83 of which lie on the bottom 81, and another pair 82 of which extend upwardly against the back wall 14 of the cabinet. It is noted that upward pull on the paper web tends to roll the supply toward the back wall 14 of the cabinet.

I consider the broad features of my invention to be, first—the use of a time-stop device with the down-pull type of dispenser and, second—the use of a time-stop device with a cabinet in which the paper is fed into operative relation with a stationary knife to be severed as a result of pull on the paper by the user.

I claim as my invention:

1. A paper towel dispensing apparatus comprising a cabinet having a delivery orifice, severing means having an upwardly facing severing edge adjacent and opposed to said orifice, means below said edge for feeding paper upwardly, and means by which the fed paper is guided to a position over the severing edge and then downwardly and outwardly through said orifice.

2. A paper towel dispensing apparatus comprising, a cabinet having a delivery orifice adjacent its top, a door giving access to the cabinet and forming the movable lower side of said orifice, the top side of the orifice being stationary with the cabinet, a stationary severing blade having an upwardly faced severing edge adjacent said orifice, means for feeding paper, means by which the paper is guided upwardly above the edge and then downwardly and through said orifice to accessible position, and means operated by the feeding means for limiting the degree of feed.

3. A paper towel dispensing apparatus comprising a cabinet having a delivery orifice, a pair of feed rolls and means for manually operating one of the rolls, severing means arranged between the rolls and the orifice and having an inwardly and upwardly facing severing edge spaced inwardly from the orifice, and a paper guide leading from the rolls upwardly above and spaced from the severing edge and then downwardly and forwardly to the orifice to cause the paper to be guided through the orifice.

4. A paper dispensing apparatus comprising, a cabinet having a delivery orifice, severing means having a severing edge, means for feeding paper, means for causing the forward edge of the paper to be guided into opposition to the severing edge and then outwardly through the orifice, said orifice, upper edge of said knife and said guide means being so proportioned and related that the severing means is at all times interposed to prevent access through the orifice to the forward edge of the remaining paper.

5. In a paper dispensing apparatus which has an elongated delivery opening outwardly through which the paper is accessibly projected and which

has a tear-off blade paralleling said opening and spaced inwardly therefrom, means for guiding the paper into tear-off relation with said blade and thence outwardly through the opening, the severing edge of the blade being so related to the guiding means, and the opening that an up or down pull on the paper after projection through the opening can result in severing the paper.

6. A sheet material dispensing apparatus comprising, a cabinet having therein stationary severing means and an orifice through which the paper is projected after passing said severing means, the paper coming from a point which is out of alignment with the orifice and in such relation to the severing means that after passing through the orifice, tautness resultant from a pull on the paper forces the paper against the severing means to sever it.

7. A sheet material dispensing apparatus comprising, a cabinet having a delivery orifice, means over which the paper is drawn on its way to the orifice, severing means arranged intermediately of said means and the orifice, and so that tautness resultant from a pull on the paper forces the paper into engagement with said severing means to cause severing.

8. A sheet material dispensing apparatus comprising, a cabinet having a delivery orifice, a roll over which the paper passes on its way to the orifice, a severing blade arranged intermediately of the roll and the orifice, so that tautness resultant from a pull on the paper forces the paper into engagement with said severing means to cause severing.

9. A sheet material dispensing apparatus comprising, a cabinet having a delivery orifice, means over which the paper passes on its way to the orifice, stationary severing means arranged intermediately of said means and said orifice, and in a substantially invisible and inaccessible position within the cabinet, and so related to said means and said orifice, that any pull on a part of the paper which projects from the orifice acts on the paper to make it taut and cause it to be pressed against said severing means and severed.

10. A paper dispensing cabinet having a delivery orifice, means which limits the amount of withdrawal of the paper and paper severing means within the cabinet arranged intermediately of the orifice and limiting means and having a severing edge which lies laterally of a straight line drawn from said limiting means to said orifice, whereby a pull to straighten the paper causes it to be forced against and be torn by said edge.

11. A cabinet having a pair of feed rolls and a discharge orifice, a guide leading from the rolls to said orifice and having a concave side facing toward the orifice and one of the rolls, and a tear-off blade arranged within the cabinet intermediately of the said rolls and orifice pointing toward said concave side and having its tearoff edge lying laterally of a straight line passing from the rolls to the orifice.

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