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PAPER TOWEL DISPENSERS

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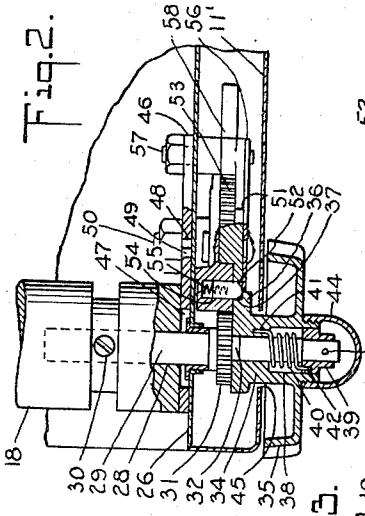


Fig. 2.

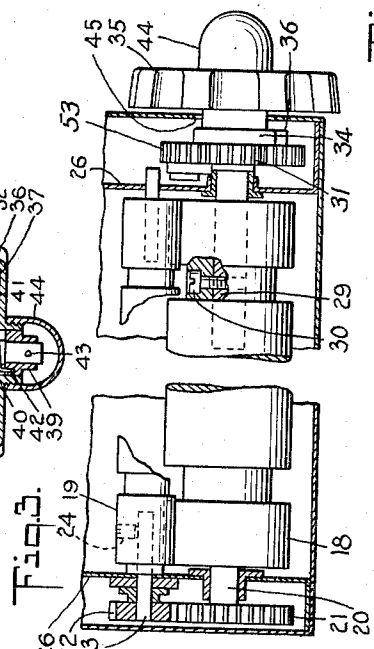


Fig. 3.

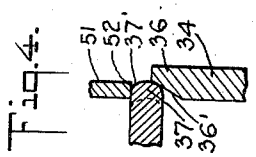


Fig. 4.

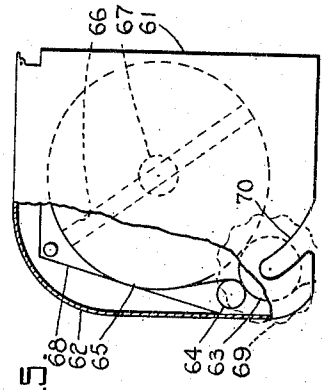


Fig. 5.

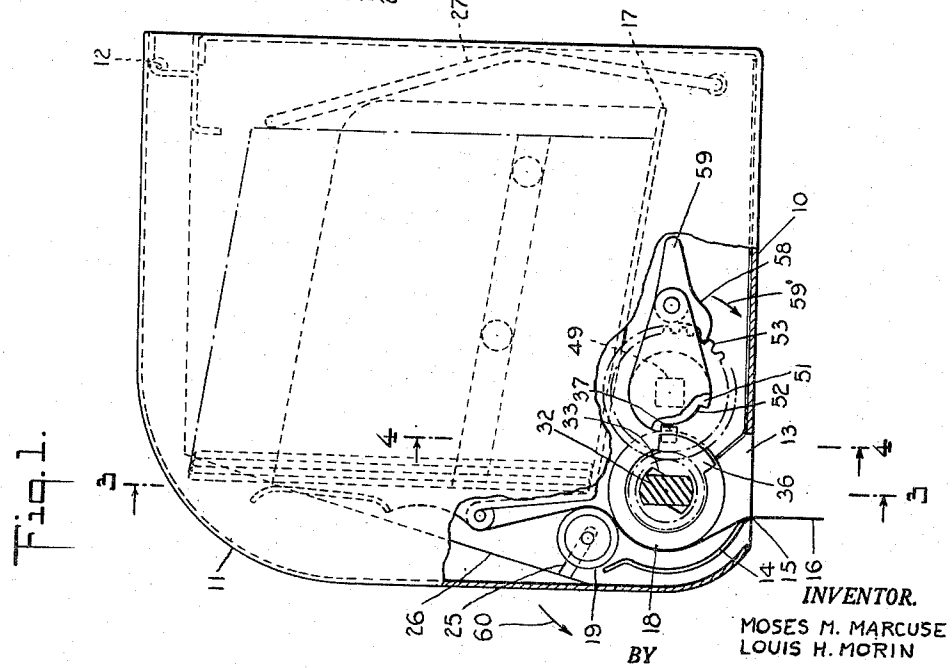


Fig. 1.

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PAPER TOWEL DISPENSERS

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11 Claims. (Cl. 312—39)

This invention relates to dispensers for delivery of paper towels. More particularly, the invention deals with manually operated means for delivering at least a short end of paper toweling from the dispenser to facilitate grasping of said end in withdrawal of a predetermined length of toweling from the dispenser.

Still more particularly, the invention deals with a positive feed means checking and controlling the length of the paper towels intermittently withdrawn from the dispenser.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and, in which:

Fig. 1 is a side and broken sectional view of a dispenser made according to our invention.

Fig. 2 is a partial broken vertical sectional view through one front corner portion of the dispenser, illustrating part of the construction in elevation.

Fig. 3 is a sectional view, substantially on the line 3—3 of Fig. 1, with parts of the construction shown in elevation and with parts broken away.

Fig. 4 is a diagrammatic sectional view substantially on the line 4—4 of Fig. 1; and

Fig. 5 is a view, similar to Fig. 1, illustrating a modified form of paper supply.

In Fig. 1 of the drawing is shown a dispenser cabinet or casing 10, generally of the type and kind disclosed in our prior application, Serial Number 470,670 filed November 23, 1954. The casing 10 has a hood 11, pivoted, as indicated at 12. The bottom of the casing has a discharge opening 13, adjacent to which is a curved wall portion 14 having a cutter edge 15 exposed to the opening 13 for severing paper toweling 16 withdrawn from the cabinet.

The paper toweling 16 is of fanfold-type and supported upon a tiltable carriage, indicated at 17, the paper passing downwardly at the front of the carriage through suitable guides and over a main feed roller 18 and beneath a supplemental feed roller 19.

The rollers 18 and 19 are shown somewhat in detail in Fig. 3 of the drawing and, in said figure, it will appear that the roller 18 has an extending shaft 20, on which is arranged a gear 21, which meshes with a gear 22 arranged on a shaft 23 fixed in the roller 19, as by means of a set screw, indicated at 24. This construction provides a positive drive between feed rollers. It will appear, however, that the supplemental roller 19 is mounted in downwardly inclined slots 25 in the side walls 26 of the casing 10, so as to provide pressure engagement of the supplemental roller 19 with the main feed roller 18.

Also indicated in Fig. 1 of the drawing diagrammatically is a yoke 27 for constantly urging the stack of fanfold paper in the direction of the forward end of the cabinet in accordance with the teachings in said earlier application.

Considering now Fig. 2 of the drawing, it will appear that the main feed roller 18 has a bore 28 at the other end thereof, in which is arranged a shaft 29 secured to the roller by a screw 30. The shaft 29 extends through one of the side walls 26 and has an integral gear 31, outwardly of which the shaft includes a flattened key section 32, cooperating with a key socket 33 in the hub portion 34 of a serrated handwheel 35. The hub portion 34 has an enlarged key operating cam portion 36 adapted to actuate a pin-type key 37, as later described.

The hub portion 34 has an enlarged bore 38, in which seats a bushing 39. Mounted on the shaft 29 within the bore 38 is a spring 30, one end of the spring being fixed to the handwheel 35, as seen at 41, whereas, the other end 42 of the spring is fixed in the bushing 39. The bushing 39 and end portion of the shaft 29 have registering apertures, through which a cotter pin 43 is adapted to pass in coupling the parts together after the desired torsion has been fixed on the spring 40. The outer end of the hub portion 34 is externally threaded to receive a closure cap 44.

It will appear, from a consideration of Fig. 2 of the drawing, that the gear 31, together with associated mechanism, later described, is arranged outwardly of the one side wall 26 and inwardly of the side wall 11' of the hood 11 and this side wall will have an opening 45 extending through the lower edge of the wall to clear the hub 34 in swinging the hood 11 into open position in the operation of refilling the cabinet with paper.

Secured to the inner surface of the wall 26, as noted in Fig. 2 of the drawing, is an elongated plate 46, apertured, as seen at 47, to clear the shaft 29 and having a square aperture 48 to engage a square end 49 on a bolt or stud 50 to key said bolt against rotation. The bolt or stud 50 has an enlarged disc-type head 51 with an arc-shaped recess 52 therein, note Fig. 1 of the drawing. The key pin 37 operates in the recess 52 in the manner later described.

Rotatably mounted on the bolt or stud 50 outwardly of the wall 26 is a gear 53 which meshes with the gear 31. The gear 53 has a socket 54, in which the key pin 37 is mounted, a spring 55 being seated in a hallowed portion of the pin 37 and in the socket 54 and normally urges the pin outwardly. Outward movement of the pin 37 is checked by a plate 56 supported upon and keyed to the end of the bolt or stud 50, the plate also forming a bearing support for a bolt or stud 57 forming the pivotal support for a pawl 58. The pawl 58 has a weighted end, as seen at 59, note Fig. 1, to constantly urge the pawl into engagement with the gear 53, this pawl serving to check the gear against reverse rotation or, in other words, in a direction opposed to the arrow 59', which is the normal feed rotation of said gear in rotation of the handwheel 35 in the direction of the arrow 60 of Fig. 1.

Normally, the various parts of the sheet delivery mechanism of the dispenser are in the position indicated in Fig. 1 of the drawing with the key pin 37 at one end of the slot 52. By engaging the handwheel 35 and rotating the same in the direction of the arrow 60, the wheel will rotate freely for a partial revolution controlled by the free movement provided in the key aperture 33, as noted in Fig. 1. During this operation, the cam surface 36' of the cam extension 36 will operate upon a rounded side portion 37' of the pin 37 to push the pin 37 inwardly to clear the enlarged disc 51, as diagrammatically illustrated in Fig. 4 of the drawing, in which an irregular section is shown taken through the rounded side portion of the pin 37 and circumferentially along the cam surface 36' of the cam extension 36. This releases the gear 53 for rotation and, at the same time, allowing the gear 31 and main feed roller 18 and supplemental feed roller 19 to

be operated to feed the paper **16** downwardly through the opening **13**. This feed, in a partial revolution of the handwheel **35**, will be sufficient to extend enough of the paper toweling to be engaged by the hand and then be withdrawn manually from the machine, this operation continuing until the gear **53** completes one cycle of a revolution, at the end of which the key pin **37** will drop into the recess **52** and strike the abutment at one end of the recess in checking further rotation of said gear and, at the same time, checking removal of the paper toweling from the cabinet. The withdrawn toweling is then severed along the edge **15** and the dispenser is now ready for the next withdrawal operation. It will be apparent that the complete discharge of paper can be performed by a series of intermittent rotary operations of the handwheel.

In Fig. 5 of the drawing, we have diagrammatically shown a modified adaptation of the dispenser, in which we have substituted for the fanfold paper toweling illustrated in Fig. 1 of the drawing a roll of paper, which is arranged in a casing **61**, generally similar to the casing **10**. At **62** is shown a hood, similar to the hood **11**. At **63** and **64** are indicated the main and supplemental rollers, between which the paper from the roll **65** passes. The same type and kind of operating mechanism is employed with the structure shown in Fig. 5, but this mechanism is not illustrated, aside from indicating in dotted lines the handwheel **69**, which is similar to the handwheel **35**.

The roll of paper **65** has, at one side thereof, a radial groove, indicated at **66**, to control mounting of the paper upon an axis **67**, which is rotatable in the side walls of the casing, one of which is indicated at **68**. The primary purpose of the radial groove **66** is to control positioning of the roll of paper in the casing, so as to maintain the withdrawn end of the paper toweling at the upper portion of the roll, so as to pass downwardly beneath the supplemental roller **64** in the manner diagrammatically seen. The structure of Fig. 5 operates in precisely the same manner as the structure shown in the other figures with respect to the removal of paper toweling from the dispenser. It will also appear that, at **70**, I have shown, in one side wall of the hood **62**, the recess for clearing the shafting of the roller **63** in swinging the hood **62** into open position, this aperture being similar to the aperture **45**, as noted in Figs. 2 and 3 of the drawing.

For purposes of description, the drive or feed means of the dispenser may be said to comprise a feed control mechanism governing rotation of the main feed roller in control of the discharge of paper toweling or other strip material from a dispenser. This mechanism comprises the shaft fixed to the main feed roller and the manually actuated element, such, for example, as the handwheel disclosed, the two gears, the key pin, which is tensionally maintained in operative position within the recess **52** of the stud head **51**. In addition to the foregoing, the mechanism includes the free action of the rotatable element on the shaft for movement of the key pin into inoperative position. Further, the mechanism includes the pawl **58** which retains the two gears against rotation in a reverse direction. This mechanism might be regarded as a workpiece feed attachment readily assembled in dispensers of the general type and kind herein disclosed.

Having fully described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A paper towel dispenser, comprising a casing having a discharge opening at one lower corner portion thereof, main and supplemental paper feed rollers adjacent said opening, means in operative engagement with one end of the main feed roller controlling discharge of predetermined lengths of paper toweling from storage of the toweling in the casing of the dispenser, said means comprising a manually operated element initially starting rotation of the main feed roller to project an end portion of the paper toweling through the opening in said casing to be engaged by a hand for withdrawal from the casing, said first named means including means to check withdrawal of the toweling from the casing after a predetermined length of toweling has been withdrawn from the casing, means, at the discharge opening of the casing, for severing the withdrawn length of toweling for removal from the dispenser, said first named means comprising a shaft fixed to the main feed roller and protruding from one end thereof, a gear on said shaft, a gear meshing with said first named gear and rotatable on a stud, said second named gear having a spring actuated key pin, the stud having a disc head recessed to receive said key pin in checking rotation of the second named gear, and means on said manually operated element operatively engaging the key pin of said gear to move said pin into inoperative position with respect to said disc head of the stud to free the second named gear for rotation in initial manual actuation of said element.

2. A paper towel dispenser, comprising a casing having a discharge opening at one lower corner portion thereof, main and supplemental paper feed rollers adjacent said opening, means in operative engagement with one end of the main feed roller controlling discharge of predetermined lengths of paper toweling from storage of the toweling in the casing of the dispenser, said means comprising a manually operated element initially starting rotation of the main feed roller to project an end portion of the paper toweling through the opening in said casing to be engaged by a hand for withdrawal from the casing, said first named means including means to check withdrawal of the toweling from the casing after a predetermined length of toweling has been withdrawn from the casing, means, at the discharge opening of the casing, for severing the withdrawn length of toweling for removal from the dispenser, said first named means comprising a shaft fixed to the main feed roller and protruding from one end thereof, a gear on said shaft, a gear meshing with said first named gear and rotatable on a stud, said second named gear having a spring actuated key pin, the stud having a disc head recessed to receive said key pin in checking rotation of the second named gear, means on said manually operated element operatively engaging the key pin of said gear to move said pin into inoperative position with respect to said disc head of the stud to free the second named gear for rotation in initial manual actuation of said element, and said key pin being automatically moved into operative engagement with said disc head in checking rotation of the second named gear to stop discharge of paper toweling from the machine, upon completing one cycle of revolution of said second named gear.

3. A paper towel dispenser, comprising a casing having a discharge opening at one lower corner portion thereof, main and supplemental paper feed rollers adjacent said opening, means in operative engagement with one end of the main feed roller controlling discharge of predetermined lengths of paper toweling from storage of the toweling in the casing of the dispenser, said means comprising a manually operated element initially starting rotation of the main feed roller to project an end portion of the paper toweling through the opening in said casing to be engaged by a hand for withdrawal from the casing, said first named means including means to check withdrawal of the toweling from the casing after a predetermined length of toweling has been withdrawn from the casing, means, at the discharge opening of the casing, for severing the withdrawn length of toweling for removal from the dispenser, said first named means comprising a shaft fixed to the main feed roller and protruding from one end thereof, a gear on said shaft, a gear meshing with said first named gear and rotatable on a stud, said second named gear having a spring actuated key pin, the stud having a disc head recessed to receive said key pin in checking rotation of the second named gear, means on said manually operated element operatively engaging

the key pin of said gear to move said pin into inoperative position with respect to said disc head of the stud to free the second named gear for rotation in initial manual actuation of said element, said key pin being automatically moved into operative engagement with said disc head in checking rotation of the second named gear to stop discharge of paper toweling from the machine, upon completing one cycle of revolution of said second named gear, and a pawl operatively engaging the second named gear to prevent rotation of said gear and said main feed roller in reverse directions.

4. A paper towel dispenser, comprising a casing having a discharge opening at one lower corner portion thereof, main and supplemental paper feed rollers adjacent said opening, means in operative engagement with one end of the main feed roller controlling discharge of predetermined lengths of paper toweling from storage of the toweling in the casing of the dispenser, said means comprising a manually operated element initially starting rotation of the main feed roller to project an end portion of the paper toweling through the opening in said casing to be engaged by a hand for withdrawal from the casing, said first named means including means to check withdrawal of the toweling from the casing after a predetermined length of toweling has been withdrawn from the casing, means, at the discharge opening of the casing, for severing the withdrawn length of toweling for removal from the dispenser, said first named means comprising a shaft fixed to the main feed roller and protruding from one end thereof, a gear on said shaft, a gear meshing with said first named gear and rotatable on a stud, said second named gear having a spring actuated key pin, the stud having a disc head recessed to receive said key pin in checking rotation of the second named gear, means on said manually operated element operatively engaging the key pin of said gear to move said pin into inoperative position with respect to said disc head of the stud to free the second named gear for rotation in initial manual actuation of said element, said key pin being automatically moved into operative engagement with said disc head in checking rotation of the second named gear to stop discharge of paper toweling from the machine, upon completing one cycle of revolution of said second named gear, a pawl operatively engaging the second named gear to prevent rotation of said gear and said main feed roller in reverse directions, and said manually operated element being keyed to said shaft and having limited free rotary movement on said shaft.

5. A paper towel dispenser, comprising a casing having a discharge opening at one lower corner portion thereof, main and supplemental paper feed rollers adjacent said opening, means in operative engagement with one end of the main feed roller controlling discharge of predetermined lengths of paper toweling from storage of the toweling in the casing of the dispenser, said means comprising a manually operated element initially starting rotation of the main feed roller to project an end portion of the paper toweling through the opening in said casing to be engaged by a hand for withdrawal from the casing, said first named means including means to check withdrawal of the toweling from the casing after a predetermined length of toweling has been withdrawn from the casing, means, at the discharge opening of the casing, for severing the withdrawn length of toweling for removal from the dispenser, said first named means comprising a shaft fixed to the main feed roller and protruding from one end thereof, a gear on said shaft, a gear meshing with said first named gear and rotatable on a stud, said second named gear having a spring actuated key pin, the stud having a disc head recessed to receive said key pin in checking rotation of the second named gear, means on said manually operated element operatively engaging the key pin of said gear to move said pin into inoperative position with respect to said disc head of the stud to free the second named gear for rotation in initial manual actuation of said element, said key pin being automatically moved into operative engagement with said disc head in checking rotation of the second named gear to stop discharge of paper toweling from the machine, upon completing one cycle of revolution of said second named gear, a pawl operatively engaging the second named gear to prevent rotation of said gear and said main feed roller in reverse directions, said manually operated element being keyed to said shaft and having limited free rotary movement on said shaft, and tensional means engaging said element and shaft to normally retain said element in position for free partial rotary movement.

6. In dispensers of the character described, employing a feed roller for discharge of strip material from a dispenser, a feed control mechanism governing rotation of the feed roller in control of each discharge of strip material from the dispenser, said mechanism comprising a shaft extending into and coupled with the feed roller, said shaft having a key section, a gear integral with said shaft, said mechanism including a plate, a stud on said plate and including a disc head, a second gear rotatable on said stud and meshing with the first gear, key means movably supported in the second gear and having means normally maintaining said key means in operatively engagement with said disc head so as to normally maintain the second gear against rotation, means freely rotatable on said shaft adjacent said first gear for operatively engaging said key means to move the same into inoperative position to free the second gear for rotation by said first gear in operation of rotating said feed roller, and said key means automatically moving into operative engagement with said disc head upon completion of one cycle of revolution of the second gear in controlling discharge of a length of strip material from the dispenser by said feed roller.

7. A structure as defined in claim 6, wherein means is employed operatively engaging the second gear for preventing reverse rotation of said gears.

8. A structure as defined in claim 7, wherein a supplemental feed roller is employed and cooperates with the first named feed roller in control of the discharge feed of strip material from the dispenser, and both of said rollers having a drive connection.

9. A structure as defined in claim 6, wherein means is employed for automatically moving said key means into operative position upon completion of one cycle of rotation of the second gear in controlling discharge of a length of strip material from the dispenser by said feed roller, and means for severing the feed material discharged from the dispenser.

10. A structure as defined in claim 6, wherein said freely rotatable means comprises a manually actuated member tensioned on said shaft to normally support the member in position for said free rotation.

11. A structure as defined in claim 6, wherein said key means comprises a key pin yieldably supported in operative position, and said freely rotatable means directly engages the key pin to move the same into inoperative position.

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