

[54] **PAPER HANDTOWEL DISPENSER**
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[51] Int. Cl. **B65h 19/00**
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312/39-41, 37, 38; 242/55.3; 226/129

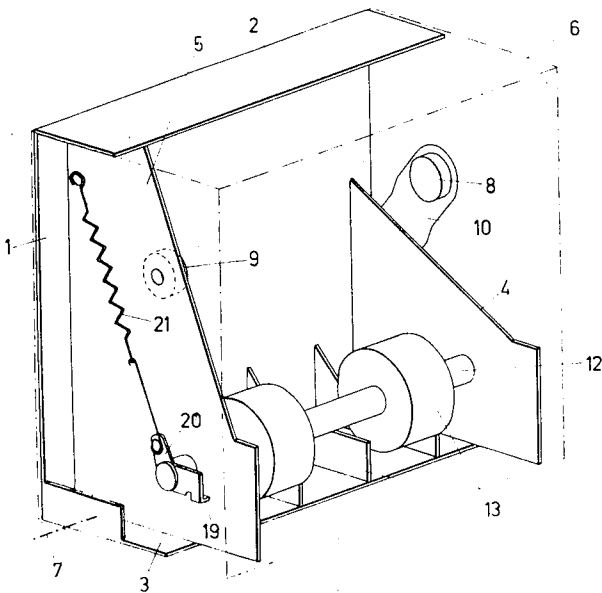
[56] **References Cited**

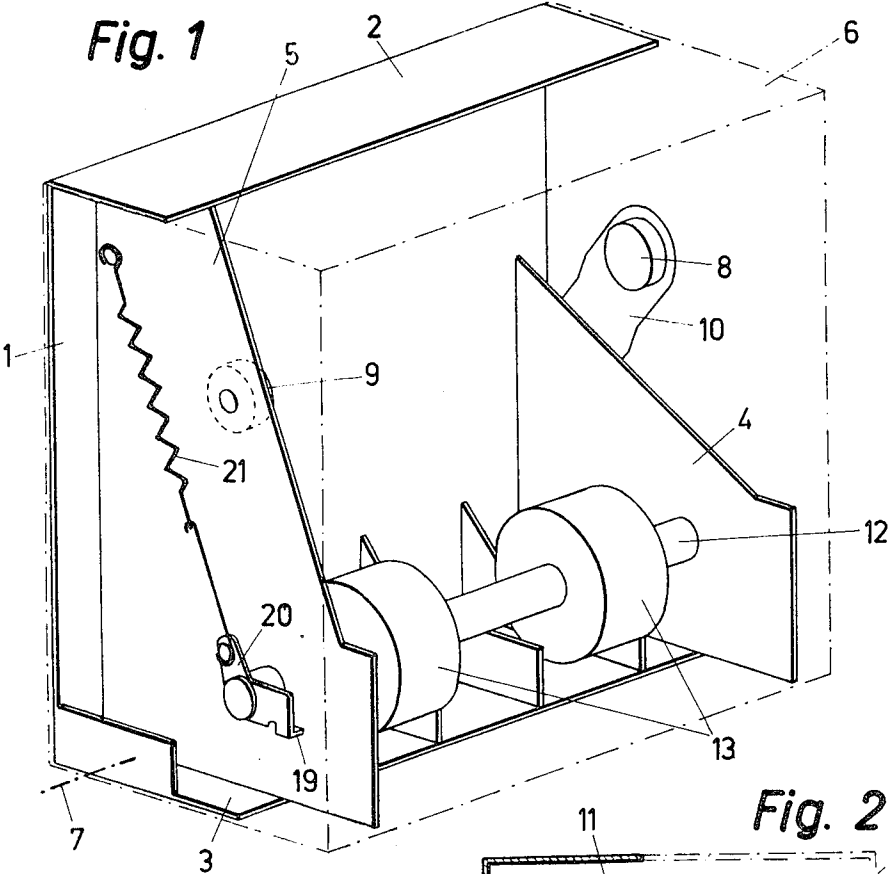
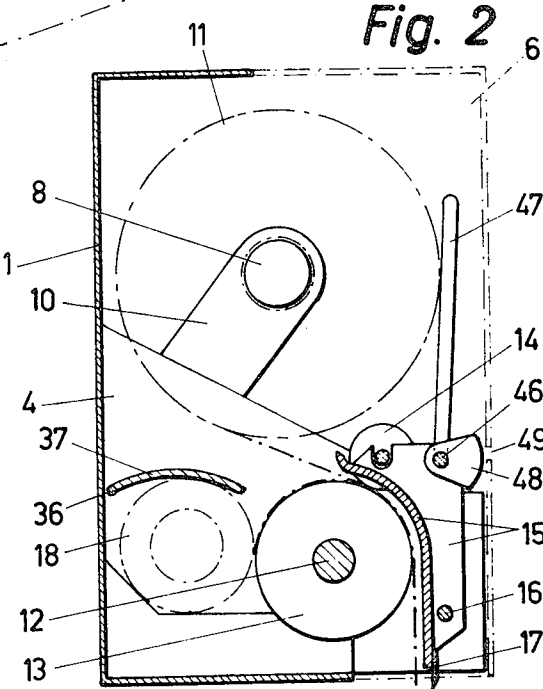
UNITED STATES PATENTS			
2,135,767	11/1938	Price et al.	312/39 X
3,294,460	12/1966	Wooster et al.	312/39
3,408,125	10/1968	Rasmussen	312/39
3,628,743	12/1971	Bastian et al.	312/39 X

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[57] **ABSTRACT**
The paper handtowel dispenser mounts a paper handtowel roll from which towelling can be withdrawn over a metering roller. A timed stop arrangement is provided which can be changed over for stopping and temporarily locking the metering roller after every two revolutions or after each single revolution, respectively. When the handtowel roll is replaced, before it is completely empty, the part-used roll can be placed in the dispenser together with the first mentioned or fresh handtowel roll so that towelling can then be withdrawn, for some time, from both rolls simultaneously. A detector member is provided for automatically changing over the timed stop arrangement so as to stop the metering roller after every two revolutions if there is only one towel roll in the dispenser, and after each single revolution if there are two usable towel rolls in the dispenser.

10 Claims, 6 Drawing Figures





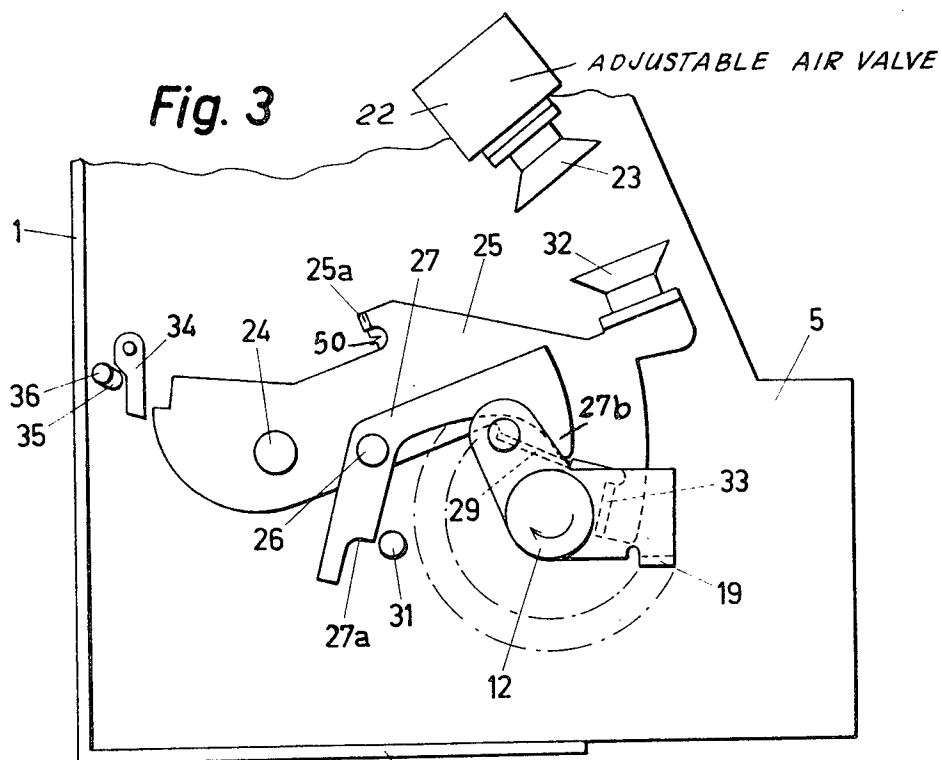
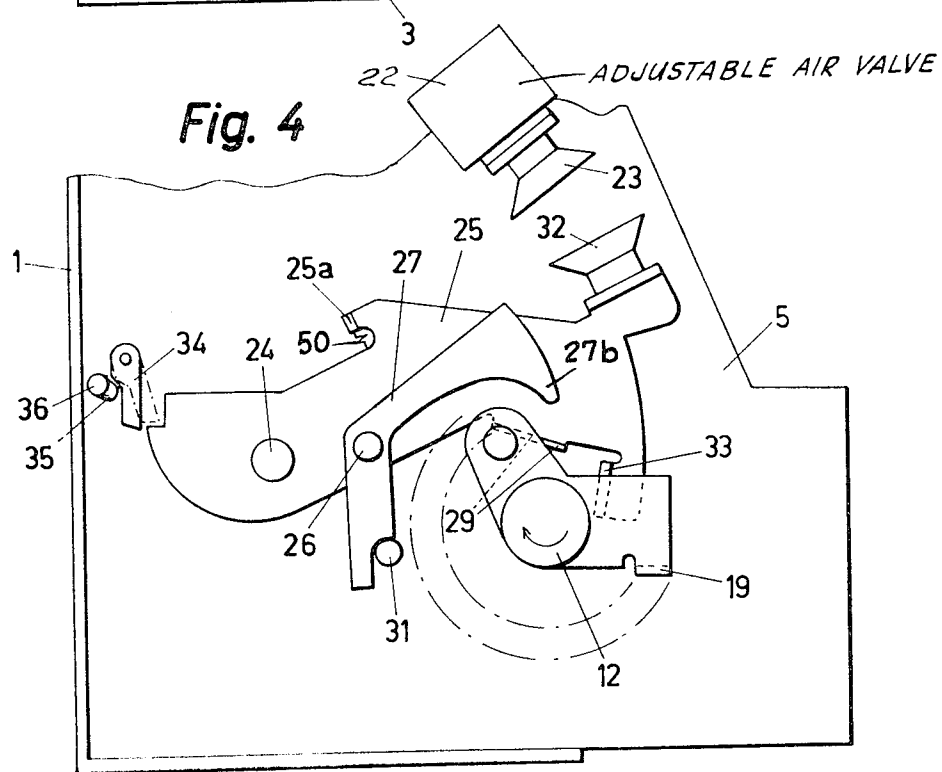


Fig. 5

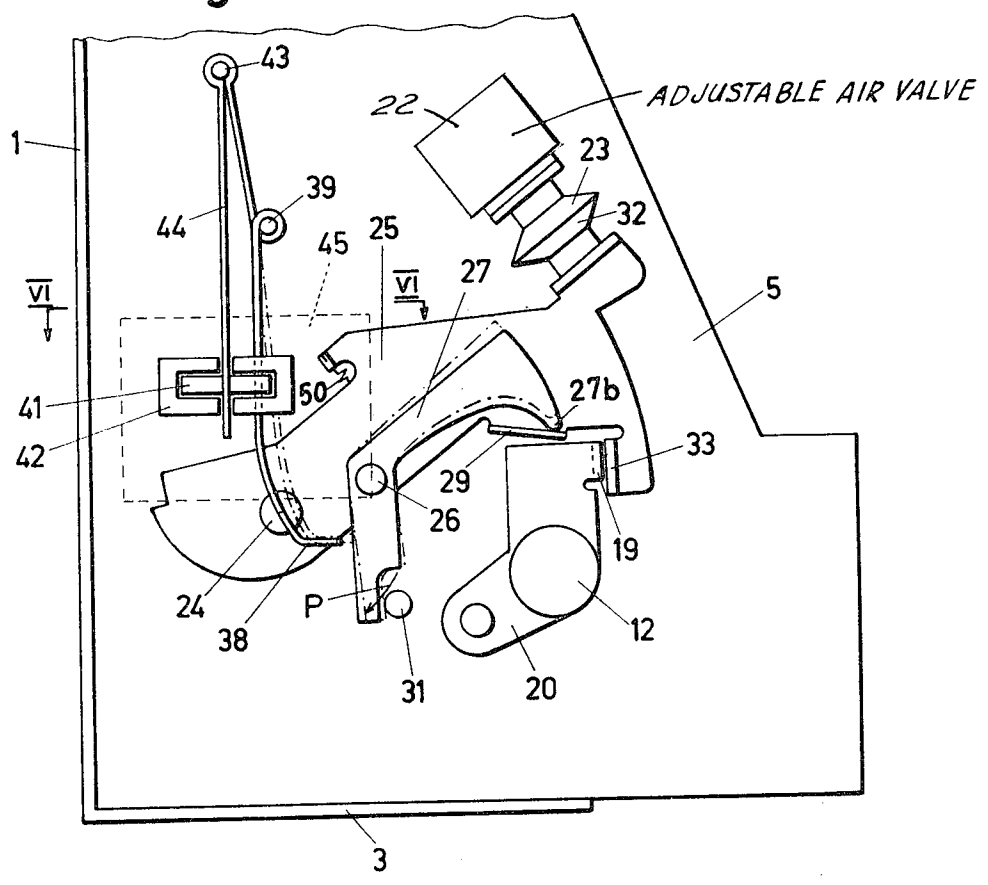
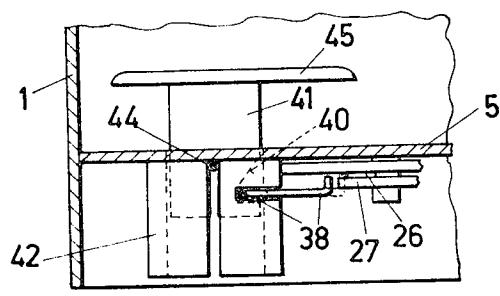


Fig. 6



PAPER HANDTOWEL DISPENSER

This invention relates to a paper handtowel dispenser comprising a casing, mounting means in the casing for mounting a paper handtowel roll, a metering roller over which paper handtowel can be withdrawn from the roll out of the casing through a slot in the latter, and a timed stop arrangement for stopping the metering roller each time a predetermined length of handtowel has been dispensed and for then holding this roller fast for a predetermined period of time.

When the paper handtowel roll has been used up in known paper handtowel dispensers of this kind, no more handtowel is available as a general rule for a long period because the attendant often cannot insert a new roll immediately. It would of course be possible to replace the paper handtowel roll prematurely, as soon as the supply of handtowel had become relatively small, for example during the daily cleaning of a toilet facility. This would however mean wastage because the part-used roll which has been replaced could normally not be used again. It is feasible that the part-used roll could be allowed to remain in the casing beside the inserted fresh roll and the two rolls then dispense paper simultaneously until the old roll had been completely used up. This, however, would not avoid the wastage because there simply would be a period in which each user would take twice as much handtowel as he needed.

Another problem attending the known paper handtowel dispensers of the kind set forth above is as follows. Tests have shown that a handtowel length of about 40 - 50 centimeters is necessary and adequate for each user. If, therefore, the timed stop arrangement were to be constituted so that the metering roller stopped once after each revolution this metering roller would have to have a diameter of about 13 to 16 centimeters to dispense the length of handtowel quoted above, and this would make the casing large and bulky.

The object of this invention is to remove the above disadvantages and drawbacks in simple fashion. The paper handtowel dispenser according to the present invention is characterized by the fact that space is provided in the casing for reception of a part-used paper handtowel roll from which paper handtowel can be withdrawn over the metering roller along with the paper handtowel from the first mentioned roll; that the timed stop arrangement is so devised as to stop the metering roller after every two revolutions but can be changed over to stop the metering roller after each single revolution; and that a detector member is arranged in the casing for automatically changing over the timed stop arrangement, this detector member holding a changeover member of the timed stop arrangement in effective position so long as there is a part-used roll of a predetermined minimum diameter present in the aforesaid space.

The timed stop arrangement may advantageously be a device of the kind which is described in Swiss Patent specification No. 493,247. Thus it can comprise a movable member which can be adjusted against a spring-and/or gravity-bias, by a trip piece rigidly connected to the metering roller, into an end position to press a suction cup carried by the member against a fixed suction cup, whereby the member disposed in the end position can hold the metering roller. The said member can have two abutments thereon arranged one behind the

other (in the direction of travel of the member) in such a way that, starting from a bottom position of the member, the aforesaid trip piece engages a first one of the said abutments during a first revolution of the metering roller to bring the member into an intermediate position, and engages the second one of the said abutments during the subsequent second revolution of the metering roller to bring the member into the end position. To hold the member in the intermediate position use may advantageously be made of a pawl which is pivotally mounted on the member and cooperates with a fixed stop means, this pawl being movable with the member, when the latter moves into its intermediate position, into the effective range of the said stop means, for example by a part rotating with the metering roller, advantageously by the trip piece which has previously been referred to. When the metering roller is to be stopped after each single revolution, that is to say so long as a part-used roll with a predetermined minimum diameter is present in the aforesaid space in the casing, the changeover member operated by the detector member can in its effective position prevent the return of the movable member through the intermediate position (to the bottom position), so that the member can then only be moved between the intermediate position and the end position. The changeover member may act directly on the aforesaid movable member to hold it in the intermediate position, or it can act on the aforesaid pawl to keep this, against a bias, in permanent contact with the cooperating stop means.

The detector member may for example be displaceable so that it bears at the end against a paper handtowel roll disposed in the aforesaid space so long as this is of at least the said minimum diameter, thereby to hold the changeover member in its effective position. When, in contrast to this, there is no part-used roll, or when the diameter of the latter is too small (in fact when there is only the practically empty roll core), this detector member can be shifted by spring action and thereby permit or effect an adjustment of the changeover member. To determine whether or not a part-used roll of the predetermined minimum diameter is present in the aforesaid space the detector member may also be a pivotable flap which bears on the periphery of such a part-used roll.

Advantageously a device may be provided to indicate the time at which the first mentioned paper handtowel roll arranged in the mounting means should be taken out and placed in the aforesaid space, and a new roll inserted in the mounting means. An arrangement of this character may be equipped with a second detector member connected to an indicator and bearing on the paper handtowel roll in the mounting means.

Embodiments of the paper handtowel dispenser according to the invention are described in more detail below in reference to the accompanying drawings.

In these drawings:

FIG. 1 is a perspective view of some only of the parts of a paper handtowel dispenser, other parts being omitted to allow simplified reading of the drawings,

FIG. 2 is a vertical section through this paper handtowel dispenser,

FIG. 3 is an enlarged side view illustrating a timed stop arrangement which is used in the dispenser,

FIG. 4 is a similar view to FIG. 3 showing the timed stop arrangement in another position,

FIG. 5 is a view similar to that of FIG. 3 but with the parts in yet another position, another embodiment of the automatic means for changing over the timed stop arrangement being also illustrated in this figure, and

FIG. 6 is a detail on the line VI — VI of FIG. 5.

The paper handtowel dispenser illustrated comprises a casing with a rear wall 1 which may for instance be fastened to a wall of a toilet. An upper wall 2, a bottom wall 3 and two lateral vertical support plates are rigid with the rear wall 1. A cover 6, which closes the paper handtowel dispenser at the front, laterally, and also partially at the top, is pivotable in relation to the parts 1 to 5 about a spindle 7 so that it can swing forwards and down to allow the dispenser to be loaded. The cover 6 is only shown in FIGS. 1 and 2 and is there depicted only in broken lines or in phantom. The forward part of the underside of the casing is open and paper handtowel can be pulled from the dispenser through the slot so provided.

The support plates 4 and 5 carry a mounting means in the form of two pintles 8 and 9. Pintle 8 is resiliently supported on plate 4 by means of an arm 10 and pintle 9 is mounted directly on plate 5. Pintles 8 and 9 fit from either end into the core of a paper handtowel roll 11 to retain this in the casing. The roll 11 is shown in FIG. 2 only and here in chain dotted line.

A spindle 12 is also rotatably mounted in plates 4 and 5 and this carries two roller bodies 13 which together constitute a metering roller. Paper towelling can be drawn from the roll 11 over this metering roller and through the opening in the bottom of the casing, as has been indicated in FIG. 2 in chain dotted lines. The paper handtowel is pressed by rollers 14 against the surfaces of the metering roller bodies 13 to prevent slippage of the paper handtowel on these surfaces which additionally may be provided with an anti-slip rubber covering. The presser rollers 14 are shown in FIG. 2 only. They are mounted in a rocker 15, which again is shown in FIG. 2 only, and is pivotally mounted in the support plates 4 and 5 by a pin 16. The rocker 15 has ribs and the pivots of the presser rollers 14 are displaceably mounted in vertical slots in these ribs and are pressed down against the metering roller 13 through the agency of springs (not shown). The rocker 15 can be pivoted down about pin 16 for the insertion of a fresh paper handtowel.

At its lower edge the rocker 15 carries a knife blade 17 over which paper handtowel is withdrawn from the casing can be torn.

Space is provided in the casing below the paper handtowel roll 11 and behind the metering roller 13 for a part-used paper handtowel roll 18 which is of smaller diameter than roll 11. The paper handtowel from this part-used roll 18, which is supported on ribs in the casing, can be withdrawn in common with the handtowel from the roll 11 over the metering roller 13, as depicted in FIG. 2.

At the outer side of support plate 5 spindle 12 of metering roller 13 carries a trip piece 19 as shown in FIG. 1 which cooperates in a manner described in more detail below with a timed stop arrangement, and also an arm 20. Arm 20 is engaged by a draw spring 21 which is shown only in FIG. 1 and is omitted from FIGS. 3 to 5 to facilitate reading of these drawings. The spring 21 biases the metering roller 13 with trip piece 19 and arm 20 into the rest position which is illustrated in FIGS. 1, 3 and 4.

The timed stop arrangement co-acting with trip piece 19 is disposed on the outer side of support plate 5 and is illustrated in FIGS. 3 to 5, but is omitted from FIG.

1. The function of this arrangement is to stop the metering roller 13 each time a predetermined length of handtowel, corresponding to two turns of the metering roller, has been drawn off, and to hold it for a predetermined period of time. It is however capable of adjustment to stop the metering roller after each one revolution when paper handtowel is drawn simultaneously from two rolls, namely the rolls 11 and 18.

As shown in FIG. 3, the timed stop arrangement includes a movable lever member 25 which is rockably mounted on a pivot pin 24 carried by the support plate 5. A fixed suction cup 23 and a stop pin 31 are additionally secured to plate 5. A spring 50 which may be conventional is engaged in known manner at one end with a lug 25a of member 25 and pulls member 25 downwards and biases it into its bottom or starting position shown in FIG. 3, in which an abutment part 29 thereof bears against spindle 12. The other end of the spring (not shown) may be connected anywhere, in known manner, so long as member 25 is biased downwards.

Pivotally mounted on a pin 26 on member 25 is a pawl 27 in the form of a two-armed lever. The righthand arm of this pawl 27 has a projection 27b and is substantially heavier than the left arm so that the pawl is biased by gravity in the clockwise direction to bring this projection 27b and the righthand arm against the abutment part 29 of member 25 (FIGS. 3 and 5).

The projection 27b of the righthand arm of pawl 27 is a first abutment for the trip piece 19 on spindle 12 and the abutment part 29 on member 25 forms a second abutment for this trip piece 19, the second abutment 29 being arranged to the rear of the projection 27b which forms the first abutment, as regarded in the direction of travel of member 25 (from the bottom position of FIG. 3 in the counterclockwise direction).

The timed stop arrangement operates as follows.

When the spindle 12 is turned in the clockwise direction from the starting or rest position of FIG. 3 by the drawing-off of handtowel over metering roller 13, during the first revolution the trip piece 19 strikes the projection 27b of the righthand arm of pawl 27 and as a result the pawl is first turned to some extent in the counterclockwise direction until its lefthand arm bears against stop pin 31. Pawl 27 is then lifted together with member 25, that is to say the latter is turned in the counterclockwise direction around pivot pin 24 against its spring bias. Finally the fixed abutment pin 31 is accommodated in a recess 27a in the end of the lefthand arm of pawl lever 27 in the end of the lefthand arm of pawl lever 27. This prevents the pawl 27 and the member 25 dropping back when trip piece 19 has left the righthand end of the pawl; thus after one complete revolution of the spindle 12 the member 25 is held in the intermediate position shown in FIG. 4.

In the course of the second revolution of spindle 12 the trip piece 19 strikes the second abutment 29 on member 25 and raises this member further into the end position thereof illustrated in FIG. 5. By reason of this a suction cup 32 secured to member 25 is pressed against the fixed suction cup 23. Simultaneously, and as soon as its lefthand arm has left stop pin 31, pawl 27 is pivoted under gravity into its starting position in which it bears against the abutment part 29. The trip

piece 19, as shown in FIG. 5, engages an abutment part 33 on member 25 in the course of the second revolution. Abutment part 33 then lies, as is shown in the path of travel of trip piece 19 when member 25 is disposed in its end position. Abutment part 33 thus prevents further rotation of spindle 12.

Spindle 12 remains blocked until the suction cups 23 and 32 are parted from one another. Member 25 then drops back under the action of its spring loading into the bottom or starting position shown in FIG. 3, the lefthand arm of pawl 27 passing by stop pin 31 as indicated by arrow P in FIG. 5. The spindle 12 is thus released again and it is then further turned by spring 21 (FIG. 1) into the rest position of FIG. 3 (through about 90°), whereupon the operating sequence can begin afresh.

The predetermined period of time during which the suction cups 23 and 32 remain adhered together and the spindle 12 remains blocked may, if desired, be regulated by means of an adjustable air inlet valve designated by 22 and shown as a labeled representation since such valves are well known in the art.

The timed stop arrangement can be changed over so that the spindle 12 will be held after each single revolution, instead of after every second revolution. To achieve this it is arranged that the member 25 shall only be able to return from its end position of FIG. 5 into the intermediate position of FIG. 4 and not to the starting position of FIG. 3. Member 25 then returns to the end position, in which it retains spindle 12, from this intermediate position after one revolution of spindle 12.

The retention of member 25 in the intermediate position can be performed in various ways.

In a first of these, illustrated in FIGS. 3 and 4, a changeover member in the form of a pawl 34 is pivotally mounted on the support plate 5, and this can cooperate with a projection on the lefthand or rear end of member 25. This pawl 34 is shown in the ineffective position in full line in FIGS. 3 and 4, viz. hanging freely downwards without impeding member 25. Pawl 34 can be pivoted into its effective position, shown in dotted lines in FIG. 4, by a tappet 35 on a spindle 36 to hold the member 25 in the intermediate position (FIG. 4). Spindle 36 is that of a pivotable flap 37 which rests on the periphery of the part-used handtowel roll 18 (see FIG. 2). Parts 34 to 37 are so arranged that the pawl 34 is in its effective position when, and only when flap 37 rests on a handtowel roll 18 of a predetermined minimum diameter. When there is no roll of paper 18 behind the metering roller 13, or when this roll 18 has an excessively small diameter, being practically used up, the pawl 34 is brought into its ineffective position.

FIGS. 5 and 6 show another method by which the member 25 can be retained in the intermediate position for the purpose indicated. In this embodiment use is made of a changeover member in the form of a loop 38 of spring wire which is mounted on support plate 5 at 39. Spring loop 38 can cooperate with pawl 27 to hold this in engagement with the stop pin 31 and as a result hold the member 25 in the intermediate position (because when member 25 drops back out of its end position the pawl 27 can no longer pass the stop pin 31 as previously described). The spring loop 38 is shown in full line in its ineffective position in which it does not contact pawl 27. A bevel surface 40 on a slide 41, against which the spring loop 38 bears, is used to shift this loop into the effective position illustrated in dotted

lines. The slide 41, which passes through support plate 5, is displaceably mounted in a guide 42 on this plate. A spring rod 44 mounted at 43 on support plate 5, and for example constituted as in the case illustrated by one end of the spring wire loop 38, extends through a slot in guide 42 and is applied against the end of a slot in slide 41 so that the rod 44 pushes the slide 41 inwards into the position illustrated in the drawing. In this position of slide 41 the spring loop 38 is applied against the bottom of the bevel surface 40 and is therefore in its ineffective position. When the slide is pushed outwards against the action of rod 44, the bevel surface 40 moves the spring loop 38 into effective position to press the pawl 27 against the stop pin 31.

Slide 41 has at the inner side of support plate 5 a detector plate 45 which bears at the end of a paper handtowel roll 18 in the space behind metering roller 13 when such a roll 18 is present and has at least a predetermined minimum diameter. This holds the slide 41 against the action of spring 44 in its outer position in which it in turn holds the spring loop in effective position. When, in contrast, there is not roll 18 present or when the diameter of the roll 18 has become so small that it finds space beneath the detector plate 45 (that is to say between the lower edge of plate 45 and the upper edge of the ribs in the casing on which roll 18 is supported), the slide 45 is pushed inwards by spring 44 into the position illustrated so that the spring clip 38 springs back into its ineffective position.

The paper handtowel dispenser described operates as follows.

In the first place a full paper handtowel roll 11 is introduced into the mounting means 8, 9 and the leading end of the paper handtowel is drawn down over metering roller 13 as illustrated in FIG. 2. For this purpose, the rocker or flap 15 (FIG. 2) is temporarily swung forwards. Also mounted in the ribs of flap 15 is a spindle 46 which carries an upwardly projecting further detector member 47. Spindle 46 is spring biased in the counterclockwise direction (by means which have not been illustrated) so that the detector member 47 is applied against the periphery of roll 11 when flap 15 is swung back.

A user can now withdraw handtowel from the roll 11 over metering roller 13 by grasping the leading end of the handtowel which is hanging out of the bottom of the casing. As a result of this action the trip piece 19 as described moves the member 25 in two stages, and this in turn after one and three quarter revolutions of the metering roller 13 stops the same and holds it for a predetermined period of time. The user can now tear the withdrawn length of handtowel against the knife edge 17. After the aforesaid time period has elapsed the metering roller 13 is turned further through about 90° by spring 21 (FIG. 1) so that a short piece of handtowel hangs from the casing once again. Further users can then in turn similarly pull out a length of towelling corresponding to two revolutions of the metering roller 13 and tear it off over knife edge 17.

After the paper handtowel roll 11 has been used for a lengthy period of time its diameter is so reduced that only a small supply of handtowel remains. This fact is detected by member 47 (FIG. 2) and displayed by an indicator sector 48 secured to the spindle 46 of the detector member and observable through a window 49 in the front wall of the casing. The legend "refill" might for example appear in the window 49. At the next op-

portunity, for example during daily cleaning, the attendant can insert a new roll 11 of paper handtowelling. This maintains the paper handtowel dispenser in continuous readiness for use.

The used roll of paper handtowel taken by the attendant from the holding means 8, 9 is disposed as roll 18 in the space behind metering roller 13 and the leading end of the paper from this roll 18 is threaded out of the casing along with the leading end of the new roll 11.

The next users then will have a double thickness of handtowelling, but for this reason will only require half the length of handtowelling corresponding to one revolution of metering roller 13, e.g. 22 centimeters instead of 44 centimeters. It is for this reason that the timed stop arrangement is automatically changed over by the insertion of the roll 18 as described above, through the agency of the detector member 36, 37 (FIGS. 2, 3, 4) or of the detector member 41, 45 (FIGS. 5, 6) to stop spindle 12 of the metering roller 13 after each revolution.

When roll 18 is practically empty the timed stop arrangement is automatically changed over again to two revolution phase, that is to say to the double length of handtowelling, the detector member checking, in the manner described, the fact that the diameter of the roll has become too small and allowing the changeover member 34 (FIGS. 3, 4) or the changeover member 38 (FIGS. 5, 6) to return to the ineffective position.

What I claim is:

1. A paper handtowel dispenser comprising:
 - a casing having a slot;
 - mounting means in said casing for mounting a first paper handtowel roll;
 - metering roller means operative to enable a user to withdraw paper handtowelling from said roll out of said casing through said slot;
 - means in said casing for receiving a part-used paper handtowel roll from which paper handtowelling can be withdrawn over said metering roller means along with the paper handtowelling from said first roll;
 - timed stop means for stopping said metering roller means each time a predetermined length of handtowel from said first roll has been dispensed and for holding said metering roller means fast for a predetermined period of time, said timed stop means comprising changeover means for changing said predetermined length of dispensed handtowel which may be drawn from said first roll, said timed stop means being operative to stop said metering roller means after a first predetermined number of revolutions when said changeover means is in a first position, and to stop said metering roller means after a second predetermined number of revolutions when said changeover means is in a second position;
 - and first detector means in said casing for automatically detecting when the diameter of said part-used roll falls below a predetermined minimum value, and changing said changeover means between said two positions in response thereto, said first detector means holding said changeover means in said second position as long as said diameter of said part-used roll is less than said predetermined minimum value.
2. A paper handtowel dispenser as claimed in claim 1, further comprising second detector means for de-

tecting and externally signalling when the diameter of said first paper handtowel roll falls below a predetermined value.

3. A paper handtowel dispenser as claimed in claim 1, wherein said timed stop means comprises:

- a moveable member;
- a first suction cup carried on said member;
- a trip piece connected to said metering roller means for moving said member from a starting position into an end position against the action of a biasing force, said member being adapted in said end position to stop said metering roller means;
- a second fixed suction cup mounted on said casing and adapted to cooperate with said first suction cup for holding said first suction cup and said member by suction during said predetermined period of time;

means to release said first suction cup from said second suction cup after elapse of said predetermined time;

two abutments mounted on said member one behind another with respect to the direction of movement of the member, a first one of said abutments being arranged to engage said trip piece during a first revolution of said metering roller means, when said member is in said starting position, for moving the member into an intermediate position, and the second one of said abutments being arranged to engage said trip piece during the subsequent second revolution of said metering roller means for moving the member into said end position to press said first suction cup against said second suction cup; and a pawl and cooperating stop means for retaining said member in said intermediate position, said pawl being moveable into the effective range of said stop means concomitantly with the movement of said member into its intermediate position, and being moveable out of this effective range concomitantly with the movement of the member into its end position; and

wherein said changeover means is adapted, when in said second position to prevent restoration of said member through said intermediate position to said starting position.

4. A paper handtowel dispenser as claimed in claim 3, wherein said pawl in said timed stop means is pivotally mounted on said movable member and wherein said stop means is a fixed stop.

5. A paper handtowel dispenser as claimed in claim 4, wherein said pawl is located in the path of travel of said trip piece connected to said metering roller, said trip piece being arranged to turn the pawl into the effective range of said fixed stop during said first revolution of said metering roller.

6. A paper handtowel dispenser as claimed in claim 5, wherein said pawl also forms said first abutment on said movable member.

7. A paper handtowel dispenser as claimed in claim 3 wherein said first detector means is displaceable parallel to the axis of said part-used paper handtowel roll, said detector means comprising a plate which is applied under spring pressure against the end of said part-used roll as long as said diameter of said part-used roll is less than said predetermined minimum value.

8. A paper handtowel dispenser as claimed in claim 7 wherein said changeover means is pressed against said pawl by said first detector means so long as said

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first detector means bears against a part-used paper handtowel roll, said changeover means in said second position preventing movement of said pawl out of the effective range of said stop means.

9. A paper handtowel dispenser as claimed in claim 3 wherein said changeover means is disposed in said second position in the path of travel of said moveable member to prevent said changeover means from being taken beyond said intermediate position of said moveable member.

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10. A paper handtowel dispenser as claimed in claim 9 wherein said first detector means is a flap which is pivotally mounted in said casing and disposed to bear on a part-used paper handtowel roll, and wherein this flap has a tappet rigidly connected thereto to hold said changeover means said second position so long as said flap bears on a part-used paper handtowel roll of diameter greater than said predetermined minimum value.

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