

[54] **DISPENSER FOR WEB-FORM HANDTOWEL**

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[57] **ABSTRACT**

A dispenser for web-form handtowel is disclosed having a casing over which in the rest condition the handtowel is always tensioned between an exit slot and an entry slot. Electric motor driven means are provided for driving a delivery roller so that this withdraws a predetermined length of handtowel from a supply and dispenses it. At the same time, a predetermined length of used handtowel is also unwound from a used handtowel roll. The loop of handtowel formed by the fresh and used handtowel lengths so dispensed hangs out of the casing during a predetermined time after which the motor driven means automatically operate to wind the handtowel up on the used handtowel roll until it is again tensioned over the casing (or until, eventually, the entire end section of the handtowel is wound up).

24 Claims, 5 Drawing Figures

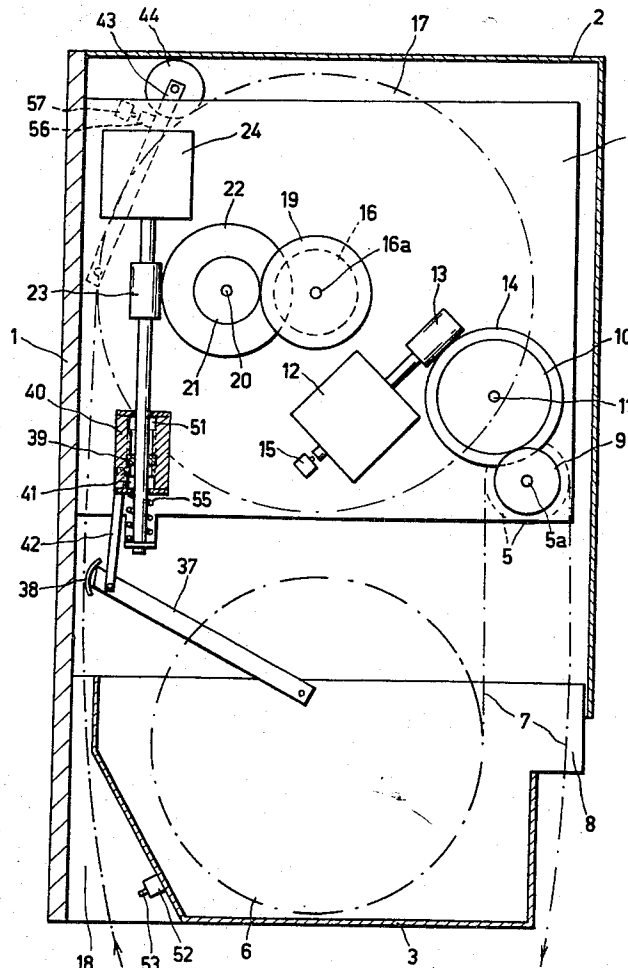


Fig. 1

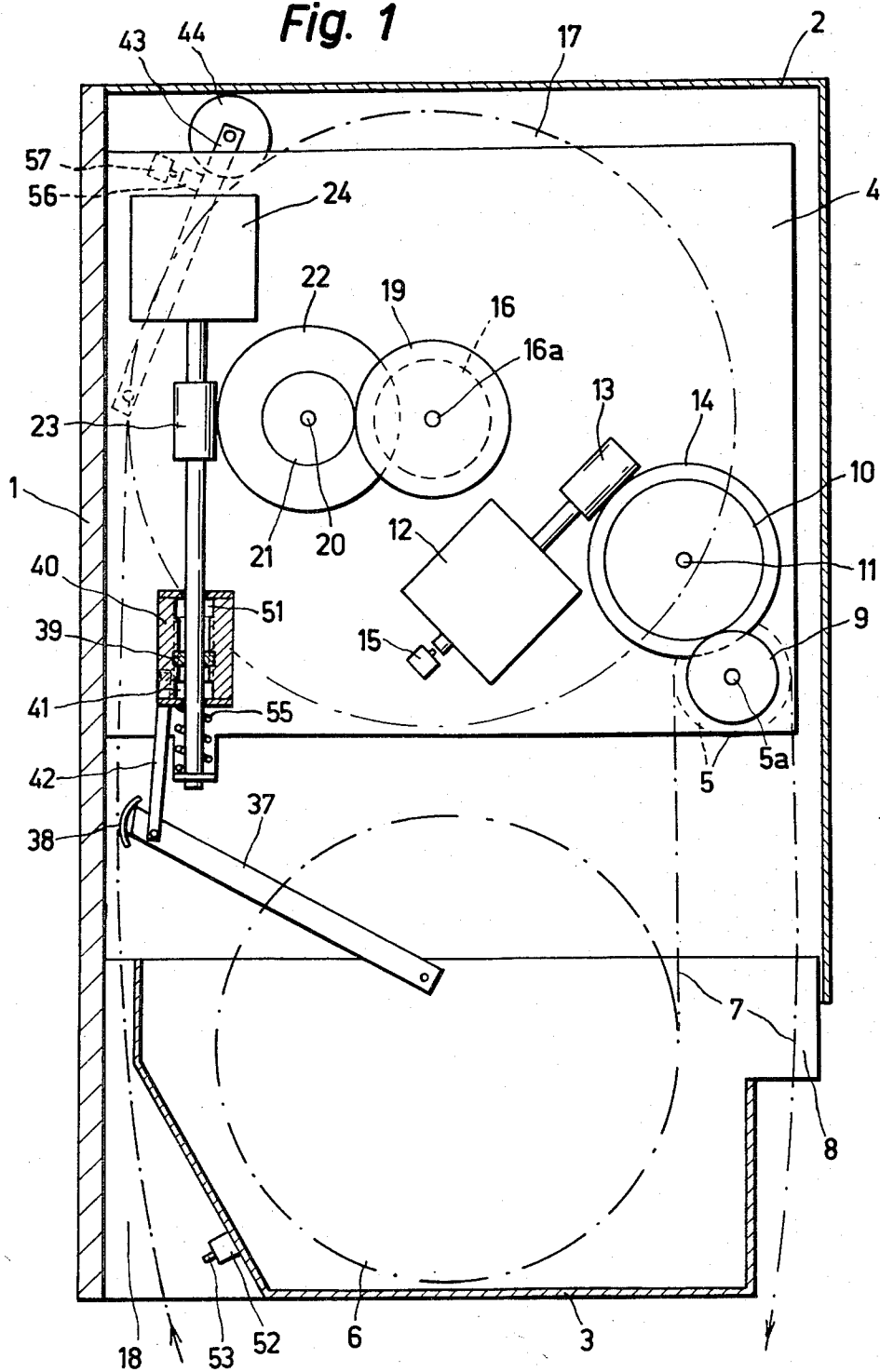


Fig. 2

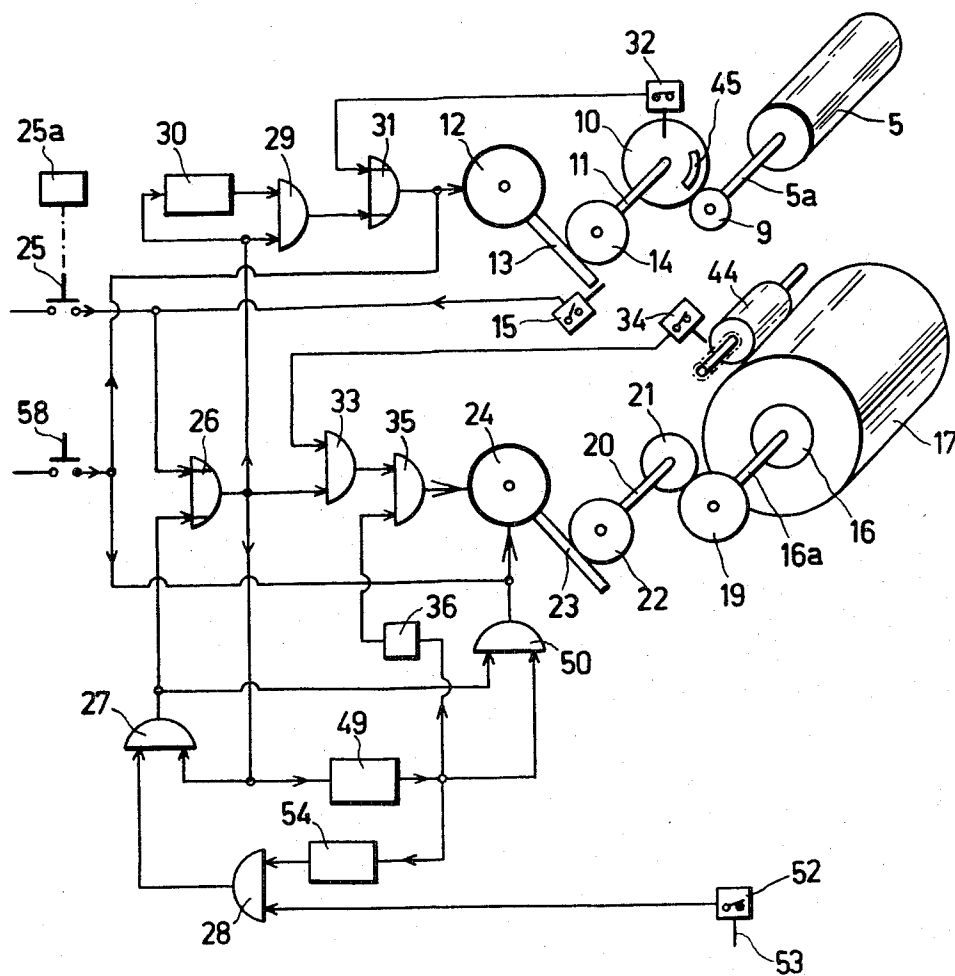


Fig. 3

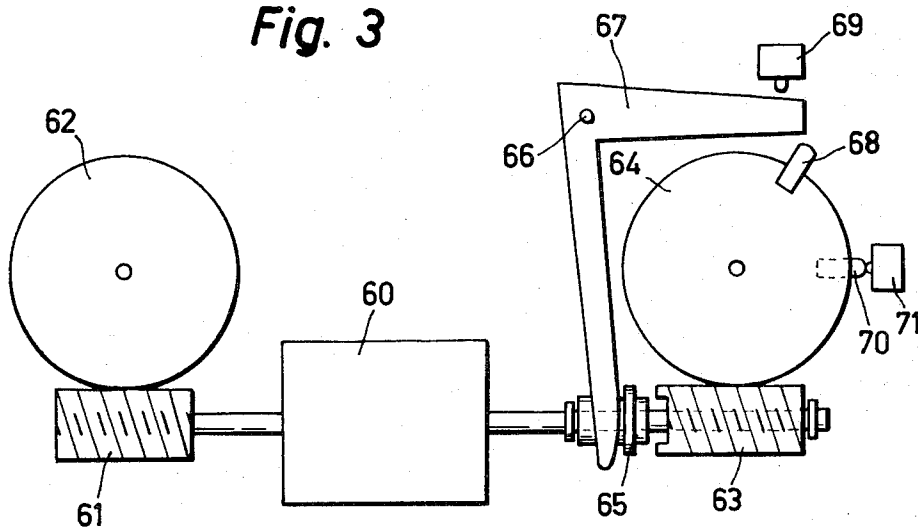


Fig. 4

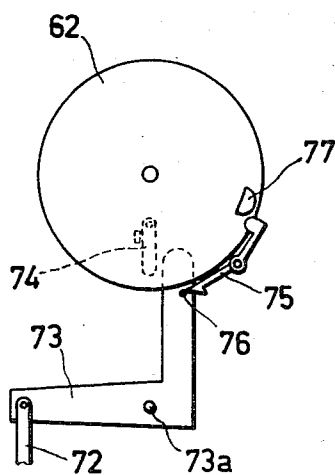
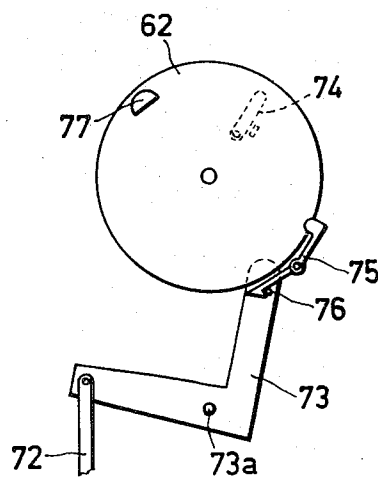


Fig. 5



DISPENSER FOR WEB-FORM HANDTOWEL

The invention relates to a web-form handtowel dispenser having a delivery roller over which is delivered the web-form handtowel coming from a supply, and having a wind-up roller for drawing in and winding up used handtowel on to a used handtowel roll.

In known web-form handtowel dispensers the fresh handtowel coming from the supply is drawn over the delivery roller and thereby turns the same. The drive for the wind-up roller, which in known dispensers always contacts the periphery of the used handtowel roll, is by a mechanical connection from the delivery roller.

In a construction of this known dispenser which has been conventional for a long time the said mechanical connection is positive and a loop of handtowel of constant length always hangs from the casing of the dispenser. A user is not therefore compelled to draw down fresh handtowel before using the dispenser; he can often - through laziness or absentmindedness - use the used handtowel loop left behind the previous user. Moreover, drive of the wind-up roller becomes impossible once the end of the handtowel supply has left the delivery roller so that the end section of the handtowel then hangs out of the casing for a long time and can be used by many people.

Both described types of multiple use are undesirable for hygienic reasons.

Web-form handtowel dispensers have also become known in which the handtowel is normally closely tensioned across the casing between a delivery slit and a take-in slit. The user can draw a handtowel loop out of the casing to dry the hands. This loop hangs freely from the casing for a predetermined time and is then automatically drawn into the latter so that the handtowel is again tensioned as explained. The end handtowel section is similarly drawn in after the final use. However these known solutions of the problems set out, themselves also have further disadvantages. According to one of the known solutions a separate mechanical handtowel store is provided in the casing. This solution is complicated and expensive and the handtowel store from which the handtowel is only removed and finally wound up during the next use, requires a lot of space. In another known solution the wind-up roller is no longer positively coupled with the delivery roller but is coupled by way of a spring means, which is tensioned by the drawing off of handtowel and which, after the expiry of a predetermined time, drives the then free wind-up roller to wind up the handtowel loop. This solution also requires a complicated, expensive construction which, moreover, is susceptible to faulty operation under certain circumstances.

Accordingly the aim of the invention is the provision of a web-form handtowel dispenser of the kind described above which solves the problem explained by automatically drawing in the handtowel loop after each use, in a simple, cheap fashion, which is less susceptible to faults and requires less space than known constructions and, moreover, provides additional advantages. Moreover, at each use, a similar predetermined length of fresh handtowel should be delivered; an incomplete actuation, which can bring problems in the known dispensers, should therefore be impossible. As the user normally uses the front part of the handtowel loop nearest to him, used handtowel should be unwound

from the used handtowel roll simultaneously with the delivery of fresh handtowel, likewise always in a similar length which is preferably less than the length of fresh handtowel.

5 The web-form handtowel dispenser according to the invention is characterised by electric motor driven driving devices for driving both the delivery roller and the wind-up roller, the wind-up roller being drivable both in the wind-up direction and in the opposite direction; means actuatable directly or indirectly by hand to switch on the drive for the delivery roller and to switch on the drive for the wind-up roller to drive the latter in the said opposite direction; means for switching off the drive to the wind-up roller after unwinding of a predetermined length of handtowel from the used handtowel roll; means for switching off the drive to the delivery roller after the delivery of a similarly predetermined length of handtowel; a timing device and means for switching on the drive to the wind-up roller in the wind-up direction after the expiry of a predetermined time; and means for switching off the drive to the wind-up roller after winding up of a length of handtowel corresponding to the sum of the handtowel lengths previously unwound from the used handtowel roll and delivered over the delivery roller.

Conveniently the driving devices can include worm gears so that the delivery roller and wind-up roller cannot be turned by hand, by drawing on the handtowel, when the drives are switched off. On the other hand the means for switching on the drive to the delivery roller and for switching on the drive for the wind-up roller in the direction opposite to the wind-up direction can be actuatable by drawing on the handtowel.

On switching on this last-mentioned drive the driving device for the wind-up roller can conveniently bring out of operation a smoothing bar for the handtowel travelling to the used handtowel roll so that this bar does not hinder unwinding. The bar can then subsequently be automatically brought into its operative position at the commencement of winding up by the driving device.

The wind-up roller can bear against the periphery of the used handtowel roll as in the known dispensers. In such a case the delivery of fresh handtowel over the delivery roller and the unwinding of used handtowel can be simultaneously switched on and off, the lengths of fresh and used handtowel delivered can then always remain in a constant relation independent of the diameter of the used handtowel roll.

The wind-up roller can also form the core of the used handtowel roll, which makes for additional economy of space since the used handtowel roll can grow into the space initially occupied by the handtowel supply. In such a case a separate measuring roller can be arranged in contact with the used handtowel to terminate the unwinding of used handtowel.

Termination of the winding up of used handtowel can be effected by means of a switch which can be actuated by a sensing member responding to the tension of the handtowel travelling to the wind-up roller as soon as the handtowel is again tensioned over the casing.

After delivery of the end of the handtowel web such a switch cannot of course be automatically actuated. Accordingly a further sensing device can be provided to switch off the wind-up drive, the device responding to the passing of the end of the handtowel (after entry into the casing). Instead of this the wind-up drive can

simply be automatically switched off after a predetermined time.

The driving device for the wind-up roller can additionally be used in advantageous manner to wind up on to the used handtowel roll a small remainder of hand-towel web present in the supply for a purpose to be described. The drive for the delivery roller can likewise be switched on or the latter can be released from its driving device.

The web-form handtowel dispenser can, without difficulty, be so constructed that changing of the handtowel can be effected in the same, usual and often employed manner as in web-form handtowel dispensers which are usual nowadays without automatic drawing in.

Mechanical completely separate driving devices with separate electric motors can be provided for the delivery roller and for the wind-up roller. Obviously it is however also possible to drive both rollers from a single electric motor and to arrange appropriate couplings in the driving devices to switch the drive on and off.

Advantageously the arrangement may be such that renewed switching on of the drive for the delivery roller and the drive for the wind-up roller in the unwinding direction is prevented until the whole of the described cycle of use has been performed and the used handtowel is wound up.

Preferred embodiments of the web-form handtowel dispenser in accordance with the invention are described below with reference to the drawings. In the drawings:

FIG. 1 is a schematic side view of the internal mechanism of a handtowel dispenser,

FIG. 2 is a diagram of the control and drive devices of the web-form handtowel dispenser,

FIG. 3 diagrammatically shows parts of a modification,

FIG. 4 shows further parts of the modification, and

FIG. 5 is the same as FIG. 4 but with the parts in a different position.

The illustrated web-form handtowel dispenser comprises a casing having a rear wall 1, an upper casing part 2 pivotally mounted on the rear wall and a lower casing part 3 which is also pivotally mounted on the rear wall 1. The rear wall 1 can be secured to a wall of a toilet room. It carries inside the casing two parallel lateral mounting plates 4, only one of which is visible in FIG. 1.

A dispensing or delivery roller 5 having an axle 5a is turnably mounted between the mounting plates 4. Web-form handtowel material, the path of which is denoted by chain dotted line 7, is guided from a handtowel supply 6, in the form of a roll lying in the bottom casing part 3, over the dispensing roller 5 and through a frontal slit 8 in the casing.

The axle 5a of the dispensing roller 5 carries a toothed wheel 9 which meshes with a toothed wheel 10 on an intermediate shaft 11. An electric motor 12 fixed to the mounting plate 4 carries on its shaft a worm 13 which engages with a wormwheel 14 also fixed to the intermediate shaft 11.

The shaft of the motor 12 and the worm 13 are axially slidable to a limited extent; they can be displaced against a spring biasing by drawing on the handtowel leaving the dispensing roller 5 to actuate a switch 15 arranged in alignment with the shaft.

A take-up and wind-up roller 16, the axle of which is coupled to an axle 16a is also turnably mounted between the mounting plates 4. The take-up roller, which is releasably connected with the mounting plates and is removable, forms the core of a used handtowel roll 17. By turning the take-up roller 16 in the clockwise direction (according to FIG. 1) used handtowel can be drawn in through a rear casing slit 18 and rolled up onto roll 17.

The axle 16a of the take-up roller 16 carries a toothed wheel 19 which meshes with a toothed wheel 21 on an intermediate shaft 20. A wormwheel 22 is also mounted on intermediate shaft 20 and engages with a worm 23 on the shaft of a second electric motor 24.

The driving devices for the dispensing roller 5 and the take-up roller 16 are schematically illustrated in FIG. 2 together with the electrical control devices for the motors 12 and 24. They will now be explained together with the manner of operation of the web-form handtowel dispenser.

When the dispenser is in the rest condition ready for operation, the handtowel is tensioned across the lower casing part 3 between the dispensing slit 8 and the intake slit 18. The tensioned handtowel, which was used by a previous user cannot therefore be used directly by a subsequent user.

The subsequent user must pull on the handtowel which is accessible below the dispensing slit 8. This causes the dispensing roller 5 to be turned somewhat and by way of the toothed wheels 9, 10 and 14 the worm 13, together with the shaft of motor 12 is displaced somewhat and actuates the normally open switch 15. Instead of this or additionally, a push button switch 25 (FIG. 2) could be provided which would have to be or could be operated by the user. Equally it is possible to provide electric control means 25a, e.g. light barrier, approach or contact switches which are actuated by hand (by interruption of the light beam, proximity of the hand in the sensing zone or contact of a push button) to close this contact.

Momentary actuation of switch 15 or switch 25 causes a pulse to be transmitted to an AND-gate 27 by way of an OR-gate 26. The AND-gate 27 is opened at this time as its second input receives a corresponding signal from an AND-gate 28. The output of AND-gate 27 is connected to the second input of the OR-gate 26, producing a self-latching effect, so that the signal at the output of the OR-gate 26 remains as long as the AND-gate 27 is open.

This output signal of the OR-gate 26 is also delivered to an AND-gate 29 the other input of which normally receives a signal from a delay and reversing circuit 30. The output of AND-gate 29 therefore delivers, by way of an OR-gate 31, a signal to motor 12 so that it drives the dispensing roller 5 to draw fresh handtowel from the supply 6 and deliver it through the slot 8. After a time determined by circuit 30 this circuit delivers to the AND-gate 29 the delayed and reversed output signal of the OR-gate 26, which means that the second input signal of this AND-gate 29 disappears and also that the output signal of the AND-gate 29 is interrupted. However, motor 12 continues to run because it has in the meantime received a signal from a normally closed switch 32 by way of the OR-gate 31 (the switch 32 is held open in a manner to be described only when the dispenser is at rest).

The output signal of the OR-gate 26 is further delivered to an AND-gate 35 by way of an AND-gate 33, the other input of which is connected to a normally closed switch 34. This AND-gate 35 is normally held open by a reversing circuit 36 and passes on the signal to the motor 24 in such manner that this latter drives the take-up roller 16 in the unwinding direction to unwind used handtowel from roll 17 and deliver it through slit 18.

A smoothing bar 38 is fixed to levers 37 which are pivotally mounted on the lower casing part 3. This bar is lifted so as not to hinder unwinding and delivery of used handtowel. For this purpose a ring 39 is fixed to the shaft of motor 24, being provided with an outer thread which engages with an inner thread in a bush 40 which is fixed against rotation. At the commencement of turning of motor 24 to drive the takeup roller 16 in the unwinding direction, ring 39 screws the bush 40 upwardly until the ring 39 arrives in an unthreaded bore section 41 at the lower end of the bush, where it continues to turn. The bush takes with it, by way of a connecting link 42, the smoothing bar 38 so that the latter is moved away from the rear wall 1.

A turnably mounted measuring roller 44 is disposed in contact with the periphery of the used handtowel roll 17 between pivoted levers 43. A co-axial threaded bore in the roller 44 engages with a screw disposed coaxially with respect to the roller. When the roll 17 turns in the wind-up direction the roller 44 is then screwed off from the screw and turns adjacent the latter (being held in contact with the screw by a spring). If on the other hand, as has already been described, the roll 17 turns in the wind-off direction, the measuring roller is screwed onto the associated screw and thereby axially displaced until, after a predetermined number of turns corresponding to a predetermined length of handtowel delivered from roll 17, it contacts a switch 34 (FIG. 2) and actuates the same.

Actuation of the normally closed switch 34 blocks the AND-gate 33 and thereby switches off motor 24. Delivery of used handtowel from roll 17 thus terminates as soon as a predetermined length of handtowel has been unwound.

Switching off of motor 12 results from the normally closed switch 32 being opened by means of a cam 45 carried on the intermediate toothed wheel 10, which opens the switch 32 after one revolution of the intermediate gearwheel 10 (and holds it open in the rest condition of the handtowel dispenser). The dispensing roller 5 has then performed approximately 1.8 revolutions. Delivery of fresh handtowel by the dispensing roller 5 thus terminates as soon as a predetermined length of handtowel has been dispensed.

Preferably a greater length of handtowel is always dispensed from dispensing roller 5 than the length of handtowel unwound from roll 17 to ensure that the front part of the handtowel loop adjacent the user and also the lower part of the loop are of fresh handtowel. For example the arrangement may be such that the motor 24 is switched off as soon as about 20 centimetres of handtowel has been unwound from roll 17, whilst the motor 12 is switched off after delivering approximately 27 centimetres of handtowel over roller 5. After the motors 12 and 24 have been switched off a handtowel loop hangs down from the dispenser on which the user dries his or her hands.

After the expiry of a predetermined time a delay device 49 transfers the output signal of the OR-gate 26 to

an AND-gate 50 which is held open by the output signal of the AND-gate 27 and therefore transfers the signal to the motor 24. Simultaneously the signal from the delay device 49 cuts off the gate 35 through reversing circuit 36. The signal delivered to motor 24 from AND-gate 50 turns the motor in the wind-up direction.

Now ring 39 screws bush 40 downwardly until it turns in an upper thread-free bore section 51 of the bush. This causes the smoothing bar 38 to be lowered to press the handtowel against the rear wall 1. The take-up roller 16 is driven from the motor 24 in the take-up direction to wind up the used handtowel.

After a length of handtowel has been wound on to roll 17 which length corresponds to the sum of the handtowel length previously unwound from roll 17 and the length of handtowel dispensed by the delivery roll 5, i.e., once the handtowel is again tensioned across the lower casing part, motor 24 is again switched off by means of a normally closed switch 52, which is opened by a contact member 53 moved by the handtowel itself as soon as the latter is tensioned across the lower part of the casing. Opening of switch 52 cuts off the AND-gate 28 so that its output signal disappears and also the AND-gate 27 is cut off and for its part cuts off the AND-gate 50. The self-latching between gates 26 and 27 is released in this way.

When, on final use, the end of the handtowel has been dispensed over roller 5 the remaining handtowel section is, after use, wound up on to roll 17 in exactly the same way as that described. However, motor 24 can no longer be switched off by the tensioned handtowel. Therefore, the signal derived from the delay device 49 is also fed to AND-gate 28 by way of a reversing and delay circuit 54 so that the signal delayed in circuit 54 cuts off AND-gate 28 after the expiry of a predetermined time even when the switch 52 is not operated and therefore remains closed. It is also possible to omit circuit 54 and instead to cut off the AND-gate with a sensing device, e.g., a mechanical contact member or a light beam or the like, which detects the passing of the end of the handtowel.

On the other hand it would be possible, by using circuit 54 in certain circumstances to omit switch 52 with sensing member 53 and also the AND-gate 28 and cut off the AND-gate 27 directly by means of circuit 54 after the expiry of a predetermined draw-in time.

After motor 24 has been switched off, assuming there is still handtowel in the supply, the dispenser is again in its rest condition ready for operation (ring 39 on the shaft of motor 24 lying in the upper unthreaded section of the bush 40, the latter however being pressed upwardly by a small spring 55 so that its threads contact the outer threads of ring 39).

Normally there are no service personnel on hand during the day to insert a new handtowel supply in the dispenser as soon as the latter contains no fresh handtowel. It is therefore preferable, in the evening to give warning by a signalling device as soon as the handtowel supply falls below a predetermined minimum value corresponding approximately to an average day's usage. To establish the size of the supply a sensing member can be employed to contact either the supply itself or the used handtowel roll 17. In the illustrated example the roller 44 and pivoted levers 43 can be used as sensing means. For this purpose an actuating member 56 can be fixed to one of the two pivoted levers, which member operates a switch 57 as soon as the roll 17

reaches a predetermined diameter (determined by the position of member 56). The switch 57 can e.g., operate a signal lamp. Moreover it is possible by means of switch 57 to operate an aural warning signal. Such optical or aural signalling means of one or more handtowel dispensers can be arranged at a remote centre to simplify supervision. Instead of such an electrical signalling device it is possible, in order to save power, particularly in the case of battery operation, to provide a mechanically actuated indicating member. (It will be appreciated that the supply of the electrical and if necessary electronic control devices and the electric motors in the described dispenser can be effected from a power line or from batteries which may be rechargeable).

When the described signalling device gives a warning the service or cleaning personnel can change the handtowel in advance e.g. during the daily cleaning of a toilet. For this purpose the small remainder of handtowel in the supply 6 is first wound on to roll 17 which can be quickly and effortlessly effected in simple manner due to the electric motor drive provided. The servicing person needs simply to press an additional push button 58 which is actuable by hand and which directly energises motor 24 in the wind up direction and simultaneously also directly energises the motor 12. In some circumstances motor 24 alone could be energised for winding up, roller 5 being uncoupled in suitable fashion so that it is freely turnable.

Obviously various components in the described dispenser could be varied without further information.

For example instead of the driven roller 16 it is possible to provide a wind-up roller driving the periphery of the used handtowel roll, the latter resting on this wind-up roller. In such an arrangement, of course, the used handtowel roll would always be positioned above the wind-up roller and the supply roll of fresh handtowel would always be positioned below the wind-up roller, whereas in the illustrated arrangement the roll 17 can grow into the space initially occupied by the supply roll 6, enabling the height of the dispenser to be smaller.

The drive to the two rollers 5 and 16 could be effected from a common electric motor by way of suitable clutches for switching the drives on and off. Instead of the reversible motor 24 a unidirectional motor could be used together with a reversible gear box. The raising and lowering of the smoothing bar 38 which ensures uniform winding of the used handtowel on roll 17, could also be effected in a manner different from that described, for example by means of an electromagnet which is switched on and off automatically at the proper times (i.e., at the beginning of the unwinding from roll 17 and at the end of this unwinding, respectively).

FIGS. 3 to 5 diagrammatically show parts of a modification in which only one electric motor is provided and in which the wind-up roller bears against the periphery of the used handtowel roll, so that the unwinding from the latter (for dispensing used handtowel into the rear portion of the handtowel loop) can be initiated and terminated simultaneously with the drive of the delivery roller. The gear ratios are however so selected that as in the previously described embodiment the length of fresh handtowel delivered is always greater than the length of used handtowel unwound.

According to FIG. 3 a worm 61 is fixed on the shaft of an electric motor 60, the worm being connected by way of a wormwheel 62 and non-illustrated toothed

gear wheels with a wind-up roller which is also not illustrated. A second worm 63 is mounted on the shaft of motor 60 so as to be turnable and axially slidable relatively to the shaft. It is connected to a delivery roller by way of a wormwheel 64 and non-illustrated gear wheels. Further a coupling sleeve 65 is disposed in axially slidable fashion on the shaft of motor 60, being connected to turn with the shaft and capable of cooperating with the lefthand end of worm 63 to rotatably couple the same with the motor shaft. A bellcrank lever 67 pivotally mounted at 66 is provided to actuate the coupling sleeve 65, being maintained in the rest position in which it is shown by a spring (not illustrated) and being movable by a rotary cam 68 on wormwheel 64 into an operating position in which it couples the sleeve 65 and hence the motor shaft with the worm 63. The manner of operation of this modification is as follows:

A user draws on the handtowel (tensioned across the casing) and thereby turns the delivery roller to some extent. As a result of this the wormwheel 64 is turned out of the illustrated initial position in the counter clockwise direction, the cam 68 rocks the bellcrank lever 67 to couple the worm 63 with the motor 60 and to simultaneously actuate a switch 69 which energises motor 60. The motor 60 now turns the worms 61 and 63 to simultaneously unwind used handtowel by means of the wind-up roller and deliver fresh handtowel by means of the delivery roller, the reaction force transmitted from wormwheel 64 to worm 63 pressing the worm against the coupling sleeve after the bellcrank lever has returned to the rest position. After a revolution of the wormwheel 64 a further cam 70 turning with the latter actuates a switch 71 which switches off the motor 60, thereby terminating the delivery of used and fresh handtowel.

After a predetermined time a non-illustrated timing device restarts the motor 60 in the opposite direction to drive the wind-up roller by way of worm 61 in the opposite direction, i.e., in the wind-up direction. As a result of this reverse turning the reaction force produced by wormwheel 64 presses the worm 63 rightwardly out of engagement with the driven coupling sleeve 65 so that the worm 63 and hence the delivery roller are not turned.

Switching off of motor 60 after winding up, takes place in similar fashion as described with reference to FIGS. 1 and 2 as soon as the handtowel is again tensioned (or the end of the handtowel has been wound up).

In this variation there is also provided a smoothing bar for the handtowel to be wound up, which bar must be lifted by means of a draw member 72 (FIGS. 4, 5) during unwinding of the used handtowel roll. The draw member 72 is here linked to a lever 73 which is pivoted about an axis 73a by a pawl 74 turning with the wormwheel 62 from the position of FIG. 4 into the position of FIG. 5 when the wormwheel 62 turns in the counter-clockwise direction to unwind used handtowel. The lever 73 is then held in the position of FIG. 5 by means of a pawl 75 which engages with a pin 76 on the lever 73.

When the wormwheel 62 turns in the clockwise direction to wind up used handtowel pawl 75 is, at the beginning of this turning, released by a further cam 77 turning with wormwheel 62 so that lever 73 swings

back into the position of FIG. 4 and the smoothing bar is allowed to fall back into its operating position.

What I claim is:

1. A web-form handtowel dispenser comprising:
a casing receiving a supply of handtowel;
a delivery roller over which the web of handtowel coming from said supply is guided;
a wind-up roller arranged for drawing in and winding up used handtowel on to a used handtowel roll in said casing;
electric motor driven driving devices for driving said delivery roller and said wind-up roller, the wind-up roller being drivable both in a wind-up direction and in an opposite direction;
means actuatable by hand to switch on the drive for said delivery roller and to switch on the drive for said wind-up roller to drive the latter in the said opposite direction;
means for switching off the drive to said wind-up roller after unwinding of a predetermined length of handtowel from said used handtowel roll;
means for switching off the drive to said delivery roller after the delivery of a similarly predetermined length of handtowel;
a timing device and means for switching on the drive to said wind-up roller in the wind-up direction after the expiry of a predetermined time;
and means for switching off the drive to said wind-up roller after winding up of a length of handtowel corresponding to the sum of the handtowel lengths previously unwound from said used handtowel roll and delivered over said delivery roller.
2. A web-form handtowel dispenser according to claim 1 and further comprising a sensing member for sensing the size of said handtowel supply, and a signalling means actuated by said sensing member for indicating the time at which the supply has fallen to a predetermined minimum size.
3. A web-form handtowel dispenser according to claim 2, wherein said signalling means is connected to said sensing member in such manner that said predetermined minimum size of said supply at which said signalling means responds, is adjustable.
4. A web-form handtowel dispenser according to claim 2, wherein said signalling means comprises an electric signalling lamp switched on by said sensing member.
5. A web-form handtowel dispenser according to claim 2, wherein said signalling means comprises an aural signalling device switched on by said sensing member.
6. A web-form handtowel dispenser according to claim 2, wherein said signalling means is arranged at a centre remote from the place at which the dispenser is installed.
7. A web-form handtowel dispenser according to claim 2, wherein said signalling means comprises an indicating member which is mechanically movable from said sensing member.
8. A web-form handtowel dispenser according to claim 1 and further comprising an additional hand actuatable switch for switching on the drive of said wind-up roller in the wind-up direction.
9. A web-form handtowel dispenser according to claim 8, wherein said additional switch also switches on the drive for said delivery roller.

10. A web-form handtowel dispenser according to claim 1, wherein said driving devices include worm drives.

11. A web-form handtowel dispenser according to claim 1, wherein said means for switching on the drive for said delivery roller and for switching on the drive for said wind-up roller in said opposite direction are actuatable by drawing on the handtowel laid over said delivery roller.

12. A web-form handtowel dispenser according to claim 1, wherein said means for switching on the drive for said delivery roller and for switching on the drive for said wind-up roller in said opposite direction comprise a switch which is actuatable directly by hand.

13. A web-form handtowel dispenser according to claim 1, wherein said means for switching on the drive for said delivery roller and for switching on the drive for said wind-up roller in said opposite direction include an electronic switching device which is actuatable by hand.

14. A web-form handtowel dispenser according to claim 1, wherein said means for switching off the drive to said wind-up roller after unwinding of handtowel include a measuring roller which is in contact with the handtowel passing to said wind-up roller and which actuates a switch after a predetermined degree of turning in the unwinding direction.

15. A web-form handtowel dispenser according to claim 14 wherein a screw is arranged adjacent the said measuring roller and co-axially therewith and said measuring roller includes a threaded bore and is so arranged that it screws along said screw when turning in the unwinding direction and then operates said switch and that when turning in said wind-up direction it screws off and then turns adjacent said screw.

16. A web-form handtowel dispenser according to claim 1, wherein said means for switching off the drive to said wind-up roller after winding up include a switch which is actuatable by a sensing member which responds to the tension in the handtowel travelling to said wind-up roller.

17. A web-form handtowel dispenser according to claim 1, wherein said means for switching off the drive to said wind-up roller after winding up are operable by a timing device after expiry of a further predetermined period of time.

18. A web-form handtowel dispenser according to claim 1, wherein said means for switching off the drive to said wind-up roller after winding up are also actuatable by a sensing device which detects the passing of the end of the web-form handtowel.

19. A web-form handtowel dispenser according to claim 1 and further comprising a smoothing bar for the handtowel travelling to said used handtowel roll and a device for moving said smoothing bar out of its operative position, said device being actuatable from said driving device of said wind-up roller.

20. A web-form handtowel dispenser according to claim 19, wherein said smoothing bar moving device includes a threaded section on a shaft of said driving device of said wind-up roller and a nut which engages this threaded section and which is movable to the end of the threaded section by turning said shaft and is connected with the smoothing bar by a draw member.

21. A web-form handtowel dispenser according to claim 1, wherein said driving devices for said wind-up roller and for said delivery roller can be driven from a

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common reversible electric motor and wherein a releasable clutch is arranged between said electric motor and said driving device for said delivery roller which clutch is engageable to drive said delivery roller and said wind-up roller in synchronism in the delivery direction and in the said opposite direction, respectively, and which is disengageable during drive of said wind-up roller alone in the wind-up direction.

22. A web-form handtowel dispenser according to claim 21, wherein said driving device for said delivery roller includes a worm which is turnably mounted on a shaft of said electric motor and which can be coupled with an axially displaceable coupling member connected to turn with said shaft.

23. A web-form handtowel dispenser according to claim 22, wherein said worm is axially displaceable on

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said shaft of said motor and the arrangement is such that the reaction of said driving device on said worm displaces the latter against said coupling member when said motor turns in the delivery direction.

24. A web-form handtowel dispenser according to claim 21 and further comprising a smoothing bar for the handtowel travelling to said used handtowel roll and a device for moving said smoothing bar out of its operative position, said device including a lever connected to said smoothing bar by a draw member, which lever is pivotable into a bar lifting position by a pawl turning with a shaft of said driving device for said wind-up roller, and can be held in this position by a further, releasable pawl.

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