

Threading of flat strip material in a towel dispenser

The present invention relates to a method according to the precharacterizing clause of Claims 1 or 2.

Known towel dispensers are installed above all in washrooms used frequently or by the public and require a great deal of maintenance. In addition, they are of relatively complicated construction and therefore impractical to handle.

The object of the present invention is therefore to simplify the threading and thus also replacement of the towel rolls and to specify suitable devices for implementing this.

According to the invention, this is achieved by the features of Claims 1, 2 and 3.

The advantages of the method according to Claim 1 consist in particular in that the threading of the strip material does not involve any complicated manipulation. The procedure required is thus reduced to changing or replacing the used roll for or by a clean roll.

Claim 2 has the advantage that the soiled towel end is wound up automatically and completely; the said towel end does not need to be touched for this purpose.

The device according to Claim 3 facilitates the handling considerably, in that the strip material is gripped and guided during the closing procedure and, similarly, freed during the opening procedure.

The expedient refinement according to Claim 4 serves for the hygienic separation of the used from the clean strip material.



The solution according to Claim 5 permits particularly simple starting of the winding procedure and also a correspondingly easy detachment of the wound strip material from the wound body.

The development according to Claim 6 can be achieved using permanent magnets or electromagnets; electromagnets, if used, have the advantage that they only have to be in operation during the starting period of the winding procedure.

Also easy to handle are tubular rollers according to Claim 7; they are advantageously left in the roll as the used towel is pushed back and are therefore easy to construct.

The variant according to Claim 8 results in a purely mechanical automation of the threading and restarting.

The preferred separation of the clean from the used region is described in Claim 9.

The development according to Claim 10 is particularly space-saving and economical.

Exemplary embodiments of the invention are explained in greater detail below with reference to drawings; in all the figures, identical parts are given identical reference numerals.

In the drawings:

Fig. 1 shows a perspective view of a towel dispenser with a simplified threading device, the apparatus housing being open,

- Fig. 2 shows the dispenser of Fig. 1 in the operating state, the housing being closed,
- Fig. 3 shows a variant of a dispenser according to Fig. 1, with an additional actuating lever,
- Fig. 4 shows a tubular roller for receiving the used towel, with displaceable lateral flanges, as a variant to Figs. 1 to 3,
- Fig. 5 shows a further variant for receiving the used towel with an articulated-link-like leading portion,
- Fig. 5a shows, in a simplified representation, an aid for pushing in the leading portion of Fig. 5,
- Fig. 6 shows the individual rolling-up phases I-IV in the variant according to Fig. 5,
- Fig. 7 shows a winding spindle for pushing into a laterally open band of the strip material and
- Fig. 8 shows a variant of Fig. 7 in the form of a winding spring.

In Fig. 1, an apparatus housing in simplified form is denoted by 1, it being mounted by its rear side R, for example, on a wall in public conveniences, beside the washbasins.

A hinged cover 1a is indicated, the position of which, when opened by way of hinges 1b, is denoted by 1a' and is illustrated.

A commonly known towel roll 2a, comprising strip material 2, is inserted here onto a plurality of vertical bearing ribs 4 cut out in a circular concave fashion; a rib 5, which projects further, serves -

on both sides - as a carrier and bearing for an axle 6 with a cylindrical deflection roller 7. The towel 2 hangs in a freely movable fashion, after correct insertion, with its leading portion 20, having a sewn-in strip 20', guided by way of a first pivot roller 19.

The single axle 18 of the pivot roller 19 is supported at the ends in respectively two, mutually opposite, pivotable bearing supports 17, guided, in turn, together with an inner, hollow-cylindrical guiding element 15, to be pivotable at axle and bearing 26 in two roller carriers 16. The axle 26 drives a winding roller 27 with a magnetic slot 25.

Turned towards the rear here is a second pivot roller 11, with axle 12, which is rotatable with its bearing support 13 and an outer guiding element 14 likewise about the axle 26.

Situated therebelow are so-called smoothing rollers 23 and 24, the respective axles 21 and 22 of which are supported to be freely rotatable in rectangular roller carriers 28.

When a clean towel roll 2a is placed onto the arcuate bearing ribs 4, the said roll positions itself according to Fig. 1. By a brief manual pull on the leading portion 20, the ferromagnetic strip 20' is pulled into the likewise magnetic slot 25 and is held securely.

This procedure is indicated in Fig. 1 by two arrows.

On subsequent closure of the cover 1a with side walls S, the rollers 11 and 19 pivot into the position depicted in Fig. 2; simultaneously, a guiding roller 8, guided in the cover 1a by means of bearing supports 9, is brought into the depicted position and the axle 26 is also rotated; as a result of this, the roller 27 - concealed in Fig. 2, visible in Fig. 1 - winds up the strip material 2 and 2'.

On their pivoting path, the two guiding elements 14 and 15 pull further strip material behind them, resulting in the formation of the loop 3 indicated in Fig. 2 which hangs out of the apparatus housing 1 in known fashion and serves for drying hands.

A preferred manner of force transmission from the cover 1a to the pivoting device is illustrated in Fig. 3.

In contrast to Fig. 1, an additional actuating lever 30 can be seen here which is guided in a cutout 31 by a flanged screw bolt 34; its linear displacement path is indicated by a double arrow. On one end face, the lever 30 has tothing 32 which engages in a spur wheel 35 mounted on the axle 26.

A pivot lever 44 is supported at its rear end on the hinge 1b and coupled to the actuating lever 30 by way of a driver 33.

The actuation of the pivot lever in the direction of the arrow B, which, as illustrated, can also be accomplished without coupling to a cover 1a', thus results in automatic threading of the strip material 2 and initiation of the winding-up of the used material 2', (cf. Fig. 2).

Simultaneously, the two guiding elements 14 and 15 effect the necessary pulling-out of the strip material 2 to form a loop and the separation of used strip material 2' from the clean material 2.

As distance- and time-limiting means for the towel length, use may be made of the generally known means operating mostly with suckers and blocking elements.

It is obvious that, after the roll 2a for drying hands has been fully used, a further movement of the actuating lever 30 or pivot lever 44

beyond the position customary in operation makes it possible to pull in the used strip material 2' completely.

The drive for the lever 30 can be provided in a manner known per se by a spring or an electric motor, which are activated once the roll 2a has been unwound or is no longer resting on the bearing ribs 4.

The further variants described below for embodying the winding roller and the corresponding leading portion of the towel are expedient to a greater or lesser degree and adaptable to the specific case, depending on the dispenser drive - manual, electrical or electromechanical with electronic control.

The tubular winding roller 27' in Fig. 4 has two mutually opposite longitudinal slots 25' which are widened on the side of the entrance. The leading portion 20 is pushed by its strip 20' into the slot 25' and is fitted with a driving flange 36 having a driver 38. On the opposite side, the winding roller 27' receives an opposite flange 37; both flanges are connected to a bearing by a square-section bar 39.

According to Fig. 5, the winding roller 27" has a large number of slots into which the leading portion 20", which according to Fig. 5a is of articulated-link-like design, is pushed.

Serving to facilitate the pushing-in procedure are lateral guiding plates 40 which, as indicated, are laterally displaceable by control linkages 41. The required advancing movement of the leading portion 20" is effected by way of additional pushers 43 which engage in lamella grooves 42.

The actual rolling-up procedure is illustrated in Fig. 6 in the phases I to IV; for reasons of clarity, in each case only the slots 25" active in the threading procedure and those adjacent thereto are illustrated; the phase IV shows the normal winding-up.

It has turned out that a fixed attachment of the strip material 2' in accordance with Fig. 5a can give rise to problems during washing (in appropriate machines), and also in the following hot mangle. For this reason, it is advisable to attach the portion having the articulated-link-like strips 20" detachably to the strip material by way of a Velcro fastener.

Winding spindles according to Fig. 7 and winding springs according to Fig. 8 have proved to be particularly successful.

According to Fig. 7, there is a band 2a' on the still clean strip material 2, the said band having loop openings on both sides with a width A of the loop opening.

This band 2a' can be constructed in a simple way as a hem 2b by means of seams and is not troublesome during washing and mangling.

When the towel dispenser is put into service, a winding spindle 27a is thus pushed into the band 2a' and the axle 26 is positioned accordingly. The winding spindle 27a has longitudinal ribs 50 and transverse ribs 51 on its axle 26; in addition, on the right-hand side there is a toothed wheel, a spur wheel 35, serving for the transportation.

The winding spindle 27a ensures simple and reliable starting of the winding procedure for the purpose of forming the roll comprising the used strip material 2'.

The variant according to Fig. 8 requires a band 2a' of smaller width A' and therefore represents an advantageous development of Fig. 7.

In this case, use is made of a winding spring 27b having a deflectable side spring 52 which is axially movable in a deflection

bead 53. The fixed part located on the right-hand side and fastened to the axle 26 merges into a short closing spring 54 and has a round (bulbous) end part 55.

It has turned out that very little manual effort is required to perform the automatic threading and that the operational reliability of the towel dispenser is improved.

Furthermore, it can be seen straightaway from Fig. 1 to 3 that both the clean roll 2a and the used strip material can be introduced into and removed from the dispenser in an extremely simple way.

A controlled, automatic ejection of the used roll into a receptacle suitable therefor is also conceivable.

By virtue of the compact construction of the dispenser which is disclosed, the distance- and/or time-limiting means known per se for the currently available towel can be attached directly to the axle of the winding roller or driven by way of toothed belts.

It would also be possible here to integrate damping elements which even out the course of the movement during acceleration and braking of the transporting movements of the towel. In the same way, the excess strip material which may occur during the loop formation can also be pulled back into the apparatus before use.



Claims

1. Method for threading and/or moving flat strip material in a towel dispenser, in which at least one continuous, clean supply of the strip material is arranged above a transporting mechanism and the outer end rests on at least one upper guiding roller as a result of gravity and forms a loop suitable for subsequent drying of hands, characterized in that, in a first method step, the towel end is positioned in the region of the subsequent rolling-up, in that, in a second method step, an apparatus cover is manually closed and/or an actuating lever is moved which triggers a rotary movement, and in that through this movement energy is transmitted to a transporting mechanism and/or a guiding element, which guide and roll up the strip material in the lower region on the one hand and synchronously unroll it from the supply on the other hand.
2. Method for threading and/or moving flat strip material in a towel dispenser, in which at least one continuous, clean supply of the strip material is arranged above a transporting mechanism and the outer end rests on at least one upper guiding roller as a result of gravity and forms a loop suitable for subsequent drying of hands, characterized in that the opening of an apparatus cover and/or the movement of an actuating lever is coupled with a transporting mechanism and/or with a guiding element, in that through this coupling a rotary movement is transmitted to a roll comprising used strip material, the strip material being rolled up at least approximately completely in the process.
3. Device for carrying out the method according to Claim 1 or 2, characterized in that the strip material (2) is guided between rollers (7,8,11), of which, in the same guiding section, at least one respective roller (7, 11) is supported axially parallel on the rear wall and/or side wall (R;S) of the towel dispenser (1) and one



respective roller (8) is supported axially parallel in the interior of the apparatus cover (1a).

4. Device for carrying out the method according to Claim 1, characterized in that at least one transporting and/or guiding element (14; 15) separates the clean strip material (2) from the used strip material (2').

5. Device according to Claim 3 or 4, characterized in that a transporting element is a winding roller (27) having at least one slot (25, 25', 25").

6. Device according to Claim 5, characterized in that the winding roller (27) is provided with a magnetic slot (25).

7. Device according to Claim 4 or 5, characterized in that a transporting element is a tubular roller (27') having a slot (25'), on the end faces of which roller (27') axially displaceable driving flanges (36, 37) engage.

8. Device according to Claim 4 or 5, characterized in that a transporting element is a roller (27") having a large number of slots (25").

9. Device according to Claim 4 or 5, characterized in that at least one segment (14) of a cylinder which is rotatably guided about its centre axis is provided as the transporting mechanism and/or guiding element.

10. Device according to Claim 4 or 5, characterized in that two segments (14, 15) of cylindrical tubes which are rotatably guided about their centre axis in coaxially interlocking fashion are provided as the transporting mechanism and/or guiding element, and in



that a support for supporting a roller (11;19) is arranged laterally on each of these segments.