

The invention relates to a cloth towel dispenser having at least one housing in which there is arranged a paying-out position with a correspondingly mounted first roll with unused towel, at least one flexible drive as well as a drawing-in position with a correspondingly mounted second roll for winding up the towel used in the area of a loop and capable of being drawn in at the end of a space of time.

There is known from FR-A-2 226 964 a towel pay-out device according to the preamble of claim 1, in which device a clean towel section, which is predetermined in its length, is drawn off from a supply roll mounted in the lower region of a housing and after use, whilst forming a section which sags in a loop-like manner in a collecting chamber, is wound up onto a storage roll, mounted in the upper region of the housing, in a time-dependent manner. Associated with the supply roll are a pay-out mechanism, a drive mechanism as well as a timer mechanism provided with suction cups and associated with the storage roll there is a collecting mechanism which is operatively connected with a drive mechanism by way of a first chain and with a coupling mechanism by way of a second chain. In the case of this pay-out device the individual function elements, in particular, however, the control means, are formed and arranged in respect of each other such that with the time-periodic, successive pulling-down action and drying of the hands by the user no additional pull need be exerted on the towel. Special function elements, with which a forceful action of pulling out a towel section and thus damage of the pay-out unit can be prevented, are not provided in the case of this pay-out device.

In the case of a towel pay-out device according to GB-A-1 137 003, for the purpose of forming an unused towel loop the towel is drawn out of a housing from a supply roll and thereby by way of a correspondingly formed drive a helical spring drive, operatively connected with a winding-up roll and arrested during the towel output, is drawn up. As soon as the user releases the clean towel, the winding-up roll is also released and the used towel is wound up. In the case of this device, the user must overcome the restoring force of the helical spring drive and at the same time exert a pull on the unused towel so that the towel loop is not wound up by the drive prematurely.

There is known from US-A-3 563 623 a further towel pay-out device in which for the purpose of forming an unused towel loop the towel is drawn out of a housing from a supply roll and in this connection a helical spring drive (torsion spring) integrated in a winding-up roll is drawn up. The winding-up roll which can be arrested by means of an associated lever system is released by way of a timer unit substantially formed

from two suction cups and an associated valve and by this means the used towel is wound up.

5 The object of the invention is to form a cloth towel dispenser of the kind explained in greater detail at the beginning and to improve it to the effect that whilst maintaining exact readiness of the unused towel in the user area and the draw-in of the used towel loop temporally matched to the use, a forceful action of pulling out a further towel section is largely
10 precluded and thus damage to the towel dispenser is prevented.

This object is achieved according to the invention in that arranged in the area of the paying-out position and parallel to and spaced from the first roll there is
15 a pay-out shaft which is formed for the purpose of mounting a pay-out roller and in that for the purpose of achieving an overload limitation the pay-out shaft is operatively connected with a first and also a second slip coupling and by way of the first flexible drive
20 sets into operation a drawing-in shaft arranged in the area of the drawing-in position, and in that the drawing-in shaft is formed for the purpose of mounting a drawing-in roller which communicates substantially by way of the used towel with the rotatably mounted second
25 roll and is operatively connected with a spring energy store operating as a slip coupling and also with a third slip coupling arranged in the drawing-in roller.

The development of the cloth towel dispenser has the advantage that, with the towel guided for the
30 purpose of forming the towel loop by way of the pay-out roller and by way of the drawing-in roller operatively connected therewith by means of the first flexible drive - as a result of the correspondingly associated slip couplings which are substantially operatively
35 connected with the two rollers - when drawing out the towel, destruction of the individual function elements caused by an uncontrolled expenditure of force is largely precluded.

A further advantage can be seen in the fact that
40 in the case of this cloth towel dispenser when drawing out the unused towel at the same time a section of the already used and wound-up towel is drawn back without reaching the area of the user, whereby the length of the unused towel to be drawn out for the drying process
45 can be kept smaller.

Further features of the invention emerge from the following description in connection with the drawing and the individual claims.

50 An exemplary embodiment of the cloth towel dispenser is represented in the Figures and described in the following.

Figure 1 shows a front view of a cloth towel dispenser with two towel units, in which case the one towel unit is in operation and the other towel unit is

ready for operation.

Figure 2 shows a diagrammatic representation of the essential inner portions of a towel unit in perspective.

5 Figure 3 shows a view of the left side wall - viewed from the front side - of a towel unit with side cover removed.

Figure 4 shows a view of the right side wall of a towel unit with side cover removed.

10 Figure 5 shows a diagrammatic representation of the drawing-in position of a towel unit with a signal flap and a base flap in perspective.

Figure 6 shows the drawing-in position according to Figure 5 with signal flap swung out.

15 Figure 7 shows a section of the drawing-in roller in the drawing-in position of a towel unit.

The cloth towel dispenser 1 represented in Figure 1 has two towel units 2, 3 which lie side by side and between which there is arranged a narrow transition frame 4. The towel unit 2, 3 is substantially a parallelepiped-shaped body of which - viewed from the front side - only the cover 5, 6, covering the housing lying behind this, is visible.

25 The towel unit 2 is represented in operation and has a cloth towel loop 8 which is visible on the underside of the unit 2 and with which the drying of hands can be undertaken. Furthermore, visible on the underside there is a signal flap 10 which in the position shown renders possible the drawing-out of the clean towel cloth and when the cloth reserve has been used up draws attention to replenishing the cloth.

30 Indicated in broken lines in the covers 5, 6 are housing walls 11, 12 within which the cloth transportation and the formation of the loop 8 occurs. Between the housing walls 11, 12 and the outer cover 13, 14 there is thus a narrow space in which all the drive and control elements are accommodated.

35 In Figure 2 a paying-out position for accommodating a clean towel roll 15 is denoted with A and a drawing-in position, which lies below the paying-out position A, for taking up and rolling up the spent towel roll 16 is denoted with E.

40 The clean towel roll 15 lies in a winding shell 18 which can be swung about an axis 17 and which is drawn upwards by means of spring force (not represented), so far as this is permitted by the roll 15. The cloth towel 7 paid out from the roll 15 is guided by way of the free edge 19 of the winding shell 18 about a pay-out roller 20, provided with a rough periphery, and then by way of a pressure roller 22, whereupon the cloth towel 7 extends within the cover downwards as far as the signal flap 10 (not represented in Figure 2) and then upwards to the drawing-in position E. Drying of hands takes place after the loop 8 has been drawn out.

In the drawing-in position E the used cloth towel is guided by way of a drawing-in roller 25 which is likewise provided with a rough surface and on which the spent towel roll 16 is wound up onto a mandrel 26 which is guided in a guide groove arranged in the housing walls 11, 12 and in this way can yield in accordance with the growing diameter of the roll 16.

The pressure roller 22 in the paying-out position A is guided in guide slots 28; as a result of guiding the towel with the formation of the loop 8 the pay-out roller 20 is pressed and reliably set rotating.

The pay-out roller 20 is secured to a pay-out shaft 29 and the drawing-in roller 25 is secured to a drawing-in shaft 30. The pay-out shaft 29 by way of a slip coupling 31 drives a first flexible drive 32 consisting of a driving wheel 33, a driven wheel 34 and a flexible element 35, for example, a toothed belt, in which case the driven wheel 34 is secured to the drawing-in shaft 30. The drawing-in shaft 30 is connected with the drawing-in roller 25 by way of a spring energy store 36. It would also be conceivable for the slip coupling 31 to be arranged on the drawing-in shaft 30 instead of on the pay-out shaft 29.

At the other end of the pay-out roller 20 the pay-out shaft 29, by way of a slip coupling 37, drives a second flexible drive 38, consisting of a driving pinion 39, a driven wheel 40 and a flexible element 41. The driven wheel 40 is mounted on a shaft 42 with a cam disc 43 which cooperates with a locking pawl 44. The cam disc 43 and the locking pawl 44 when drawing out the cloth towel 7 for the purpose of forming the loop 8 limit the length of the towel to be pulled out. The release of the locking pawl 44 occurs by means of a timer which is described further with the aid of Figure 4.

On the side of the drawing-in roller 25, remote from the spring energy store 36, see Figure 7, a drawing-in shaft portion 45 is connected with a multi-step gear unit 48 (only one step represented), by way of which a brake wheel 50 is driven at very high speed. The brake wheel 50 has the task of preventing the relaxation of the spring energy store 36 when the towel unit is opened and of blocking the drawing-in shaft 30 when the timer is switched on.

Figure 3 shows the view of the housing wall 11. The reference numerals corresponding with the reference numerals of Figure 1 denote the same parts.

The first flexible drive 32 and also an intermediate wheel 52, which wheel is part of a towel supply indicator 53, extend in a substantially diagonal manner. The arm 54 connected with the supply indicator 53 has a tooth construction 55 which cooperates with a worm 57 secured to a shaft 56. The shaft 56 is connected with the intermediate wheel 52 by way of a

further worm gear unit 56', 57'. As soon as the towel is drawn out to form the loop 8, the supply indicator 53 is also adjusted. Associated with the driven wheel 34 on the drawing-in shaft 30 there is a locking gear unit 58 with two discs 59, 60 which engage in the manner of a maltese cross, the disc 59 having a cam 61 and the disc 60 having a groove 62.

5 A shaft 63, which is tensioned by a spring 64, passes through the housing and constitutes a sensor for ascertaining the presence of towel. The towel runs between the sensor and a cross-piece arranged on the cover and extends further about the signal flap 10 (Figure 1).

10 65 denotes an interlocking rod which when the cover is opened frees a base flap 81, see Figures 5 and 6, the axis of rotation 66 of which lies close to the axis of rotation 67 of the signal flap 10. The interlocking rod 65 prevents the closure of the towel unit. If the cover 5, 6 is to be closed, in the first instance the base flap 81 must be engaged again, the cover 5, 6 pressed against the housing and an interlocking hook 68 swung with a key (not represented) into the closing position, with the interlocking hook cooperating with a locking element 68'.

20 The reference numerals 69, 70 denote elevations in the housing wall 11, the recesses on the inside for accommodating the spring-system of the winding shell 18 or for guiding the mandrel 26 in the drawing-in position E.

25 Figure 4 shows the view of the housing wall 12. Mounted on the pay-out shaft 29 is a locking wheel 71 which by means of cooperation with a resilient pawl 72 prevents the pay-out shaft 29 from turning backwards. Also mounted on the pay-out shaft 29 - connected by means of the slip coupling 37 - is the driving pinion 35 39 of the second flexible drive 38. The driving pinion 39 drives the driven wheel 40 on the axis of which the cam disc 43 is arranged. A pawl 44 represents a portion of a swivel arm 74 which can be swung about an axis 73 and which bears a suction cup 75 and a braking roller 77. When drawing out the towel 7 for the purpose of forming the loop 8, the suction cup 75 is pressed by the cam disc 43 onto a suction cup 76 and at the same time the towel withdrawal is blocked by means of the pawl 44. At the end of the set time, the suction cup 75 and the further suction cup 76 separate; the braking wheel 50 is freed, as a result, from the action of the braking roller 77. The cam disc 43 is herewith set free so that by means of the spring energy store 36 in the drawing-in shaft 30 the loop 8 which has been drawn out begins to be drawn in. With the drawing-in of the loop 8, the multi-step gear unit 48 is set into motion by the drawing-in shaft 30 and the brake wheel 50 is run up. During the compression of

the suction cups the braking roller 77 presses onto the brake wheel 50 and prevents a movement of the drawing-in shaft 30.

5 If the cover 5, 6 is opened, a second braking roller 78 acts on the brake wheel 50 and prevents the rotation of the drawing-in roller 25 and thus the spring energy store 36 from running off. The braking roller 78 lies above an interlocking rod 80 which
10 corresponds to the interlocking rod 65 and with which the base flap 81, which can be swung about the axis 66, is locked and when the cover 5, 6 is opened prevents the closure of the same. The braking roller 78 is mounted on a swing lever 83 which projects as far as
15 the area of the interlocking shaft 85 which bears the interlocking hooks 68 and is controlled by means of a cam 84 which is arranged on this shaft.

In Figures 5 and 6 the function of the signal flap 10 and the base flap 81, which lies behind this and can be swung about the axis 66, is represented. The base flap 81 has at its free end a rotatable roll 82 about
20 which the used cloth towel 7 is guided. The base flap 81 is held in its working position by means of the interlocking rods 65, 80. As soon as the cover 5, 6 is opened, the base flap 81 is unlocked in the area of the rotatable roll. The interlocking rods 65, 80 with this
25 are displaced somewhat in the direction of the cover which can only be closed again when the rotatable roll 82 of the base flap 81 is brought into its operating position.

30 In Figure 5 the signal flap 10 forms a part of the base and in practice is not visible. This means that the towel unit 3, see Figure 1, is ready for operation, yet has not yet been used. When first used, the signal flap 10 swings into the position represented in Figure
35 6. The signal flap 10 is pivoted on the shaft 67, whilst the shaft 67 is held by means of a lever 86 by a two-armed lever 88 in a position in which a swing force is exerted on the lever 86 by a spring 87. A two-armed lever 88 is operatively connected with a lever 89
40 secured to the sensor shaft 63, see Figure 4.

In Figures 5 and 6 the sensor shaft 63 is represented with its sensor rake 90. As long as the towel 7 covers the sensor rake 90, the lever 89
45 is in a position in which the two-armed lever 88 holds the lever 86 of the signal flap shaft 67 in a tensioned position. As soon as the end of the cloth towel 7 has passed over the sensor rake, the sensor shaft 63 swings under the effect of the spring 64, see Figure 3, with the sensor rake 90 against the cover 5, 6 in which
50 there are recesses for the passage of the rake bars. As a result, the two-armed lever 88 is swung by the lever 89 so that the lever 86 of the signal flap shaft 67 is swung in an anticlockwise direction. This swing movement is utilized in order to bring the adjacent

towel unit 3 out of the position of readiness represented in Figure 5 by swinging the signal flap 10 out into the operating position. This can be effected in a simple manner by means of a square tube which is arranged on a square at the end of the signal flap shaft 67. A further connection for the towel unit 3 is not necessary.

Both the towel unit 2 and the towel unit 3 can be operated separately. Merely the relevant cover is to be used. Only in the case of joint arrangement are these covers to be replaced by the transition frame 4 and at the same time with the connection tube is the coupling of the two signal flap shafts 67 to be effected. When the sensor shaft 63 is swung out, in addition an operating rod 91 is raised, by means of which rod the braking roller 77 is raised so that the brake wheel 50 can be set into motion by the spring energy store 36, whereby the towel end is drawn into the drawing-in position.

An aid when inserting a clean towel lies substantially in the centre of the housing wall 12 represented in Figure 4 in the form of a locking wheel 92, a spring-loaded pawl 93 cooperating with the locking wheel 92 and a push rod 94. When opening the cover the push rod 94 is pushed forwards, whereby the pawl 93 engages into the locking wheel 92. If the front end of the new cloth band is laid over the pay-out roller 20 and the band is drawn out in order to lay the end about the mandrel 26 of the drawing-in position E, the cam disc 43 is also turned therewith. With each rotation it moves the swing arm 74, whereby the pawl 93 is removed from the locking wheel 92 and the locking wheel 92 is turned by means of a further pawl 93' by one tooth. After running through, for example, five teeth, the pawl 93 blocks the swing arm 74, see Figure 4. The wound-up cloth length suffices for the insertion of the band front end about the mandrel 26 and thus does not need to be measured. If there is further rotation with force, the slip coupling 37 functions and prevents disturbance of the dispenser. This device thus not only facilitates the insertion of a clean towel, but also prevents inexpert insertion or the application of force from damaging the dispenser.

The section represented in Figure 7 through the drawing-in roller 25 shows on the left side, that is in the region of the housing wall 11, the driven wheel 34, the discs 59, 60 of the locking gear unit 58 and a cover wall 95, which is omitted in Figure 4. The driven wheel 34 is mounted on the drawing-in shaft 30 which extends substantially over the centre of the drawing-in roller 25. A housing portion 96 of the spring energy store 36 is secured there, on the drawing-in shaft 30.

The drawing-in roller 25 consists of two

5 cylindrical portions 98 and 99 which are connected with each other by means of a coupling portion 97 which forms, moreover, the other housing portion of the spring energy store 36. Installed in the area of the driven wheel 34 in the drawing-in roller, instead of the slip coupling 31 in the pay-out shaft 29, there is a slip coupling 100 which consists of an outer housing 101 and an inner housing 102, a drag spring 103 being inserted between the two housing portions 101, 102.

10 The slip couplings 31, 37, 100 mentioned in connection with the pay-out roller 20 and the drawing-in roller 25 are advantageously known slip springs which slip upon reaching the limiting torque. In the same way, the spring energy store 36 is a driving spring which is formed as a slip spring. As a result of the installation of the slip couplings 31, 37 and 100 and of the spring energy store 36 of this kind, incorrect manipulations and forceful actuation are largely avoided at the cloth towel dispenser.

20 Evident on the right-hand side of the drawing-in roller 25, that is in the area of the housing wall 12, as represented in Figure 7, there is a portion of the multi-step gear unit 48 by way of which the brake wheel 50 is driven. The gear unit 48 is provided with a covering 104 which was omitted in Figure 4.

25 An interruption-free towel service can be guaranteed with the cloth towel dispenser 1 described, if the change of a towel roll is undertaken in time, that is, as long as the other towel unit is in operation. The change of the roll is simple and can be carried out quickly.

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Claims

1. Cloth towel dispenser having at least one housing in which there is arranged a paying-out position (A) with a correspondingly mounted first roll (15) with unused towel (7), at least one flexible drive (32) as well as a drawing-in position (E) with a correspondingly mounted second roll (16) for winding up the towel used in the area of a loop (8) and capable of being drawn in at the end of a space of time, characterised in that arranged in the area of the paying-out position (A) and parallel to and spaced from the first roll (15) there is a pay-out shaft (29) which is formed for the purpose of mounting a pay-out roller (20) and in that for the purpose of achieving an overload limitation the pay-out shaft (29) is operatively connected with a first and also a second slip coupling (31, 37) and by way of the first flexible drive (32) sets into operation a drawing-in shaft (30), arranged in the area of the drawing-in position (E), and in that the drawing-in shaft (30) is formed for the purpose of mounting a drawing-in roller (25) which communicates substantially by way of the used towel (8) with the rotatably mounted second roll (16) and is operatively connected with a spring energy store (36) operating as a slip coupling and also with a third slip coupling (100) arranged in the drawing-in roller (25).

2. Cloth towel dispenser according to claim 1, characterised in that the first slip coupling (31) operatively connected with the drawing-in roller (25) by means of the first flexible drive (32) is formed such that when forming the loop (8) a small towel return can be obtained from the second roll (16).

3. Cloth towel dispenser according to claim 1, characterised in that the first flexible drive (32), which connects together the shafts (29, 30) provided, in each case, with a corresponding driving or driven wheel (33, 34), has a transmission dimensioned such that the rotational speed of the drawing-in roller (25) is greater than the rotational speed of the pay-out roller (20).

4. Cloth towel dispenser according to one of the claims 1 to 3, characterised in that associated with the drawing-in roller (25) there is a locking gear unit (58) with which when forming the loop (8) it is possible to obtain a rotational movement of the drawing-in roller (25) limiting the length of the towel return.

5. Cloth towel dispenser according to claim 1, characterised in that the pay-out shaft (29) is operatively connected with a second flexible drive (38) which when forming the loop (8) turns a cam disc (43) and in that the cam disc (43) after a number of revolutions of the pay-out roller (20) for the purpose of limiting the loop formation strikes against a



locking pawl (44) and as a result it is possible to block the pay-out roller (20) and also the drawing-in roller (25) operatively connected therewith.

5 6. Cloth towel dispenser according to claim 1, characterised in that arranged in the area of the drawing-in roller (25) there is a signal flap (10) which is pivoted on the housing and indicates the readiness for operation.

10 7. Cloth towel dispenser according to claim 1, characterised in that there is provided a towel supply indicator (53) which when forming the loop (8) can be actuated by way of a correspondingly formed worm gear unit (55, 56, 56', 57, 57') operatively connected with the first flexible drive (32).

