

PAPER TOWELING DISPENSER

BACKGROUND TO THE INVENTION

Paper toweling dispenser comes in various designs. In one particular design
5 the paper toweling dispenser comprises a rotatable paper toweling support roller with
a cutter blade pivotally mounted on the outer peripheral portion of said support roller.
The blade is cam driven and moveable wherein at one position the cutting edge of said
blade is close and adjacent to the outer peripheral portion of the support roller and in
another position said blade is disposed at an angle relative to the outer peripheral
10 portion with the cutting edge of the blade spaced from said support roller and projects
in a direction generally opposed to the direction of rotation of said support roller so
that pulling force exerted on the paper toweling by the user will bear against the
cutting edge of the cutting blade to sever said paper toweling.

It is the objective of the present invention to forward a direction control device
15 to ensure compliance to the predetermined direction of rotation of the support roller.

It is a further objective of the present invention to forward a direction control
device that is simple in design and in operation.

SUMMARY OF THE INVENTION

20 The direction control device of the present invention is for use on a design of a
paper toweling dispenser with said paper toweling dispenser comprises a housing, a
pair of spaced apart outwardly extending arms attached to said housing, roll
engagement members at the upper ends of said extending arms for rotatably support a
roll of paper toweling, a support roller positioned apart and below said supported
25 paper toweling and support columns to support said support roller. The support roller
is for receiving paper toweling from the roll of paper toweling, said support roller
comprises a cutter blade pivotally mounted on the outer peripheral portion and cam
driven wherein at one position the cutting edge of said blade is close and adjacent to
the outer peripheral portion of said support roller and in another position said blade is
30 disposed at an angle relative to the outer peripheral portion of said support roller with
the cutting edge of said blade spaced from said support roller and projects in a
direction generally opposed to the direction of rotation of said support roller. A

pulling force exerted on the lead end of the paper toweling by the user will bear it against the cutting edge of the cutter blade to sever said paper toweling. To effect the advancement of the paper toweling and extension of the cutting edge of the cutter blade to sever said paper toweling, the support roller is set to rotate in a predetermined direction.

A direction control device of the present invention is included to the paper toweling dispenser to ensure compliance of the support roller to the predetermined direction of rotation. The direction control device comprises a ring having a plurality of substantially uniform but asymmetrical gear teeth on its inner circumference, a plate and a plurality of teeth pivotally hinged to said plate. The plate comprises a plurality of substantially evenly spaced radial arms extending from a center, a central aperture and a through hole towards the outer extend of each said radial arms. The through holes are substantially circular and symmetrically positioned on the radial arms and with their centers lying on the circumference of a circle having its centre substantially coincidental to the center of the plate. The plurality of teeth, pivotally mounted to the radial arms of the plate act as pawls for engagement with the gear teeth of the ring to form a ratchet. The ring is attached fixed at the outer face of a support column that supports the support roller at one end. The plate, with the pivotally hinged teeth, is coupled to the support roller and rotates together with it in the same direction as said support roller. Rotation of the support roller, in a specified direction, due to the pulling force exerted on the toweling by a user is allowed. However rotation of the support roller in the opposition direction and resulting in the withdrawing of the paper toweling is prevented by the direction control device of the present invention.

These and other features, advantages and objectives of the present invention will be further understood and appreciated by those skilled in the art by the following specification, appended drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows the direction control device of the present invention.

Fig. 2 shows the plate of the direction control device of the present invention.

Fig. 3 shows the ring and the positioning of the plurality of teeth of the direction control device of the present invention.

Fig. 4 shows the top view of the paper toweling dispenser with the cover removed.

5 Fig. 5 shows a perspective view of the paper toweling dispenser with the cover removed.

Fig. 6 shows another perspective view of the paper toweling dispenser with the cover removed.

10 **DETAIL DESCRIPTION OF THE INVENTION**

The paper toweling dispenser (6), onto which the direction control device (1) of the present invention is attached, is for dispensing paper toweling from a roll of paper toweling in response to application of a pulling force applied to the lead end of said paper toweling. The paper toweling dispenser (6), as shown in Fig. 4, Fig. 5 and
15 Fig. 6, comprises a housing (32), a pair of spaced apart outwardly extending arms (34a, 34b) that are attached, at their lower ends, to said housing (32), roll engagement members at the upper ends of said extending arms (34a, 34b) for rotatably support a roll of paper toweling (33), a support roller (30) positioned spaced apart and below said supported paper toweling (33) and support columns (31a, 31b) to support said
20 support roller (30). The support roller (30) is for receiving paper toweling from the roll of paper toweling (33). The support roller (30) further comprises a cutter blade (not shown) pivotally mounted on the outer peripheral portion of said support roller (30). The blade is moveably mounted and cam driven wherein at one position the cutting edge of said blade is close and adjacent to the outer peripheral portion of the
25 support roller (30) and in another position said blade is disposed at an angle relative to the outer peripheral portion of said support roller (30) with the cutting edge of said blade spaced from said support roller (30) and projects in a direction generally opposed to the direction of rotation of said support roller (30) so that a pulling force exerted on the lead end of the paper toweling by the user will bear said paper toweling
30 against the cutting edge of said blade to sever said paper toweling. To effect the advancement of the paper toweling and the extension of the cutting edge of the blade, in order to sever said paper toweling, the support roller (30) is set to rotate in a

predetermined direction. The direction control device (1) the present invention is included to the paper toweling dispenser (6) to ensure compliance of the support roller (30) to rotate in the predetermined direction for advancement of the paper toweling and to prevent a reversal in the direction of rotation of said support roller (30) leading to withdrawal of said paper toweling.

The direction control device (1) of the present invention comprises a ring (3), a plate (2) and a plurality of teeth (4) pivotally hinged onto said plate (2). The inner circumferential of the ring (3) comprises a plurality of gear teeth (15) that are substantially uniform but asymmetrical with each gear tooth (15) having a moderate slope on one edge and a much steeper slope on the other edge as illustrated in Fig. 3. The plate (2) further comprises a central aperture (12), a plurality of radial arms (10) spaced substantially even and extend from a center position and a through hole (11) towards the outer extend of each said radial arms (10) as shown in Fig. 2. In the preferred embodiment of the plate (2), as shown in Fig. 2, there are six radial arms (10) with each through hole (11) on each said radial arms (10) substantially circular and symmetrically positioned. Additionally the centers of the through holes (11) on the radial arms (10) lie substantially on the circumference of a circle having its center substantially coincidental to the center of the plate (2). Stiffeners (13) are present to increase the rigidity of the plate (2). Each tooth (4) of the plurality of teeth (4) comprises a pointed tip (16) at one end and a stub (17) extending upright in one direction from the plane of said tooth (4) as indicated in Fig. 3. A tooth (4) each is pivotally mounted to each radial arm (10) of the plate (2) with the stub (17) of said tooth (4) fitted cooperatively onto the through hole (11) of said radial arm (10). The pivoted plurality of teeth (4) acts as pawls for engagement to the gear teeth (15) of the ring (3) and together to form a ratchet.

In the setup the ring (3) is attached fixed and in the preferred embodiment fixed to the outer face of a support column (33b) that supports one end of the support roller (30). The plate (2), with the pivotally hinged teeth (4) reside within the ring (3) with said plate (2) coupled to the support roller (30) and in the preferred embodiment is coupled at the central aperture (12) to said support roller (30) at an end. The plate (2), when coupled to the support roller (30), rotates together with and in the same direction as said support roller (30). Rotation of the support roller (30) in a specified

direction is controlled by the direction control device (1) in order that the paper toweling can advance. Rotation of the support roller (30) is normally initiated by a pulling force exerted on the leading edge of the paper toweling by a user. Rotation of the support roller (30) in the reverse direction is prevented by the direction control device (1) so that the paper toweling cannot retract from said support roller (30). In the example as illustrated in Fig. 1 and Fig. 5 rotation of the support roller (30) and the plate (2) are allowed in the clockwise direction only. Rotation of the support roller (30) and the plate (2) in the anti-clockwise direction is prevented by the hinged teeth (4) reacting against the gear teeth (15) of the ring (3) that is mounted fixed.

10 It should be noted that for sake of clarity all the components and parts of the apparatus may not be shown and marked in the drawings. Additionally the terms as used in this description refer to the items as orientated in the drawings and they may in any various orientations when in use and as such the orientations as illustrated in the drawings are not necessary for operability.

15 The foregoing description is considered as illustration of the principles of the invention. Furthermore, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

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CLAIMS

1. A paper toweling dispenser (6) comprising:
 - a housing (32);
 - 5 a pair of spaced apart outwardly extending arms (34a, 34b) attached to said housing (32);
 - roll engagement members at the upper ends of said extending arms (34a, 34b) for rotatably support a roll of paper toweling (33);
 - a support roller (30), said support roller (30) comprises a cutter blade pivotally
 - 10 mounted on the outer peripheral portion of said support roller (30), said cutter blade is cam driven and is close and adjacent to the outer peripheral portion of said support roller (30) in one position and in another position said blade is disposed at an angle relative to the outer peripheral portion of said support roller (30) with the cutting edge spaced from said support roller (30) and projects in a direction generally opposed to
 - 15 the direction of rotation of said support roller (30) so that a pulling force exerted on the lead end of the paper toweling by the user will bear against the cutting edge of said blade to sever the paper toweling;
 - said support roller (30) positioned spaced apart and below said supported paper toweling (33) and support columns (31a, 31b) that support said support roller
 - 20 (30) with said support roller (30) for receiving paper toweling from the roll of paper toweling (33), wherein the direction of rotation of said support roller (30) is controlled by a direction control device (1),
 - characterized in that said direction control device (1) comprises;
 - a ring (3) having on its inner circumference a plurality of gear teeth
 - 25 (15) that are substantially uniform but asymmetrical and with said ring (3) attached fixed;
 - a plate (2) residing within said ring (3) with said plate (2) comprises a plurality of substantially evenly spaced radial arms (10) extending from the center, a central aperture (12) and a through hole (11) towards the outer extend
 - 30 of each said radial arm (10);
 - a plurality of teeth (4) with each tooth (4) comprising a pointed tip (16) at one end and a stub (17) extending upright from the plane of said tooth (4)

and with each tooth (4) pivotally hinged by said stub (17) at said through hole (11) of a radial arm (10) and with said plurality of teeth (4) act as pawls for engaging said gear teeth (15) of said ring (3).

5 2. A paper toweling dispenser (6) as in claim 1, wherein the centers of the through holes (11) of said direction control device (1) lie substantially on the circumference of a circle having its center substantially coincidental to the center of the plate (2).

10 3. A paper toweling dispenser (6) as in claim 1, wherein the ring (3) of said direction control device (1) is attached fixed to the outer face of a support column (33b) that supports one end of the support roller (30) and the plate (2), with the pivotally hinged teeth (4), is coupled fixed at the central aperture (12) to the support roller (30) at said end and with said plate (2) and said support roller (30) rotate
15 together with and in the same direction.

 4. A paper toweling dispenser (6) as in claim 1, wherein the plate (2) of said direction control device (1) has six radial arms (10) with the through holes (11) on said radial arms (10) substantially circular and symmetrically positioned.