(19) Europäisches Patentamt
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(11) **EP 2 218 383 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.08.2010 Bulletin 2010/33

(51) Int Cl.:
A47K 10/36 *(2006.01)* *A47K 10/38* *(2006.01)*

(21) Application number: **09397503.5**

(22) Date of filing: **11.02.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

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(54) **Paper roll dispenser**

(57) The invention concerns an apparatus for dispensing paper from a roll. The dispenser includes as basic parts a rack (1) for supporting the paper roll (2) to be dispensed, and means (3) for delivering the paper. The apparatus includes further means for sensing the tightness of the paper web (4) between the roll (2) and the delivering means (3) and a braking device (5) for restricting the spinning of the paper roll (2) in the unwind direction.

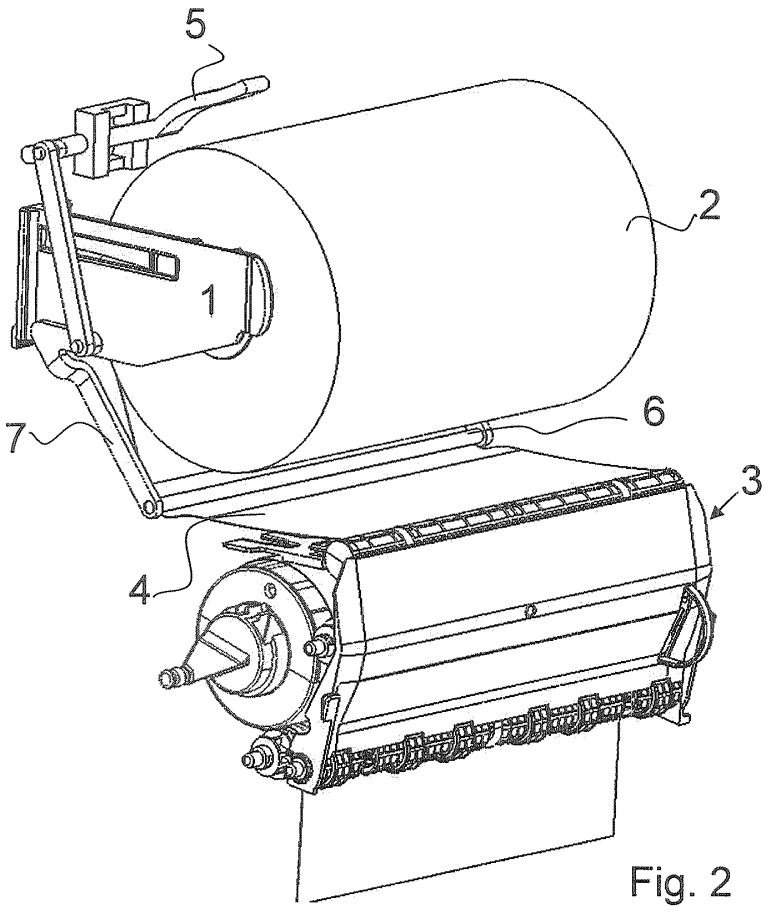


Fig. 2

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Description

[0001] The present invention concerns a dispenser for dispensing paper from a roll, like for dispensing towel paper as sheets to be torn or cut to a fixed size.

[0002] In the dispensers in question, the paper is traditionally in a roll supported in a horizontal position by an appropriate rack, generally in a closed housing. An end of the paper web to be dispensed from the roll is led outside the housing so that the paper can be gripped and pulled by the user to get a desired length of the paper or alternatively a fixed-size sheet cut by the dispenser. Dispensers dispensing free web lengths are furnished with a suitable tearing device in connection with the dispense opening. Alternatively, the web can be perforated into suitable sheet sizes.

[0003] The user-friendliness of the dispenser requires that the paper roll is easily spinning, which also is a requirement with dispensers, that include a dispensing device cutting the web into sheets. Result from the sensitive moving of the roll is, however, that due to the inertia caused by the spinning movement caused by dispensing, the roll tends to spin longer than what is required by the dispensed web length.

[0004] On the other hand, dispensing devices utilizing the stub roll before starting to dispense from a refill roll, have a problem that the new, refill roll starts to unwind too early. These kinds of dispensers are generally equipped with a dispensing device cutting the paper web into predetermined size, dispensing paper one predetermined-sized sheet at a time. The dispensing device includes a function that changes into a new roll when the paper is running out from the stub roll. The operation of this kind of a device requires that the starting end of the web coming from the refill roll is in close contact with the web of the stub roll to be dispensed. The friction between the webs and static electricity generated by the friction tend to take too early the starting end of the web of the refill roll along with the web of the stub roll.

[0005] The problems mentioned above would be solved, if the roll delivering paper to be dispensed, respectively the refill roll waiting for the refill, could be restricted from spinning in the unwind direction, controllably in an appropriate way from the point of view of the operation of the dispenser. An apparatus according to the invention, including, as known in the art, a rack for supporting the paper roll to be dispensed and means for delivering the paper, comprises as a characteristic feature of the invention means for sensing the tightness of the paper web between the roll and the delivering means, and a braking device controlled by the tightness sensing means for restricting the spinning of the paper roll in the unwind direction. Special embodiments of the invention are provided in the dependent claims.

[0006] The invention will be described in more detail in the following, with reference to the enclosed drawing, wherein

Figure 1 shows one embodiment of a dispenser according to the invention in one operating mode,

Figure 2 shows the same dispenser in another operating mode, and

Figure 3 shows an alternative embodiment of the dispenser according to the invention.

[0007] Figure 1 shows schematically basic parts of a traditional apparatus dispensing paper towel from a roll. The paper roll 2 to be dispensed is supported by a rack 1 in a horizontal position. The roll 2 is freely spinning in the rack 1. Web 4 is taken from the roll to the device performing the dispensing, indicated generally with reference 3, and not explained in this connection in more detail. These devices are well known in the art. They are powered when the paper is drawn out from the dispenser. Also corresponding dispensing devices with motor drive are known in the art, usually with a motor connected to an electrical network. These dispensers deliver paper from the dispenser one sheet at a time, cutting said sheet from the web 4 coming from the roll 2.

[0008] In operation, the dispensing device 3 draws paper web 4 from the roll 2. When the dispensing operation ends, some degree of spinning inertia is left in the roll, whereby it tends to push more web 4 than what needed by the dispensing device during this section. Loosening of the web as such can cause blocking problems in the operation of the device.

[0009] One problem is the sudden loss of the loosening during the next dispensing section, transmitting a sharp pull to the roll through the web 4, accelerating it to an extra rotating motion.

[0010] According to the invention, an antispin device 5 is included in the dispenser, coming controllably weight-loaded into contact with the roll 2. When the antispin device 5 is in contact with the surface of the roll 2, the roll is prevented from spinning freely. The pressing load of the antispin device 5 is controlled by an element 6 sensing the tightness of the web 4 between the roll and the dispensing device 3. This element is a weight-loaded or spring-loaded pin or roll supported by the web 4. The pin 6 is connected with leverage 7 to the support of the antispin device 5 so that when the pin 6 goes down along with the loosening web 4, the antispin device 5 correspondingly lowers down onto the surface of the roll 2. When dimensioning the components of the leverage 7, the operation of the device must be taken into account when the diameter of the roll 2 changes due to the use of the paper.

[0011] When the web 4 is tight, the antispin device 5 is totally out from the surface of the roll 2, whereby the paper web spins freely from the roll 2. This situation is illustrated in the enclosed Figure 2.

[0012] Figure 3 shows one special embodiment of the invention. This figure illustrates one paper dispenser type including the possibility to use up the stub roll. This kind

of an arrangement provides some flexibility to the refilling of the dispenser. It is not necessary to aim the refilling situation just at the phase, when the roll delivering paper to be dispensed has run out of paper. If there is still paper left in the roll in the refilling situation, it can be moved to continue dispensing as a so called stub roll 8 in a space designed for it in the dispenser. A new roll, refill roll 2', can be placed in the actual dispensing space, and the starting end of its web is thread to a position of readiness in the dispensing device 3. The position of readiness includes devices for moving the starting end of the refill roll 2' to the use of the dispensing device in a situation, where the paper web of the stub roll 8 runs out.

[0013] Also with this dispenser embodiment it is necessary to prevent the unintended (too early) spinning of the refill roll 2' by placing in connection with the roll refilling an antispin device 5 on top of the roll 2' into a lying position, with a suitable weight-loading. This prevents the starting end of the refill roll 2' from being carried along with the web coming from the stub roll 8 to be dispensed further in the dispensing device, than what is meant from the point of view of its operation. Only when the starting end of the web coming from the new roll has set itself to the dispensing device to be dispensed, the dispensing device tightens the web enough, whereby the antispin device 5 rises from the surface of the roll 2' and allows the spinning motion of the roll caused by the pulling force directed to the web 4.

[0014] The antispin device may be accomplished also otherwise than what is described in the illustrated embodiment. The element forming the braking part 5 of the antispin device may contact also either one or both of the reel end sides, or may be positioned to follow the outreeling of the roll 2 inside the reel core, and contact the inside surface of the core when braking is required. A weight-load mechanism for the antispin device in each of these embodiments may be applied, of alternatively a spring load directed to the lever mechanism supporting the braking part of the antispin device.

Claims

1. An apparatus for dispensing a paper roll, said apparatus including a rack (1) for supporting the paper roll (2) to be dispensed, and means (3) for delivering the paper, **characterized in that** the apparatus includes means for sensing the tightness of the paper web (4) between the roll (2) and the delivering means (3) and a braking device (5) for restricting the spinning of the paper roll (2) in the unwind direction under control of the sensing means.

2. An apparatus according to Claim 1, **characterized in that** the braking device (5) is an antispin device, the position of said antispin device being controlled weight- or spring loaded by a sensor (6) supported by the web (4).

3. An apparatus according to Claim 1 or 2, **characterized in that** the paper delivering device (3) is a device dispensing the paper as sheets cut to a predetermined size.

4. An apparatus according to Claim 3, **characterized in that** the delivering device is driven by a user through a pulling load.

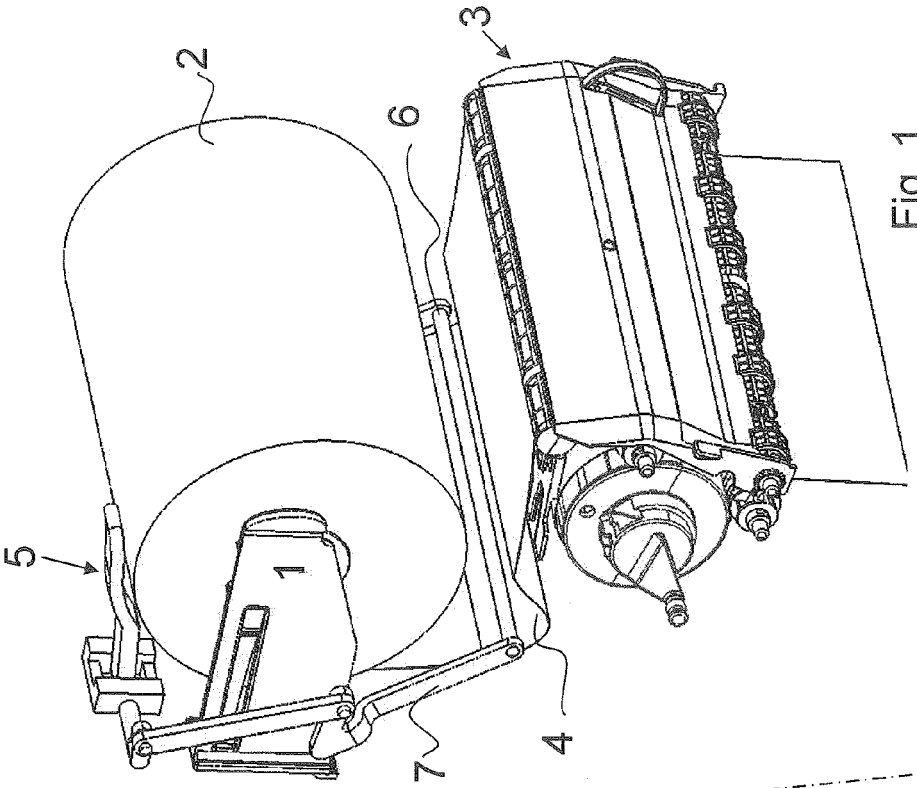


Fig. 1

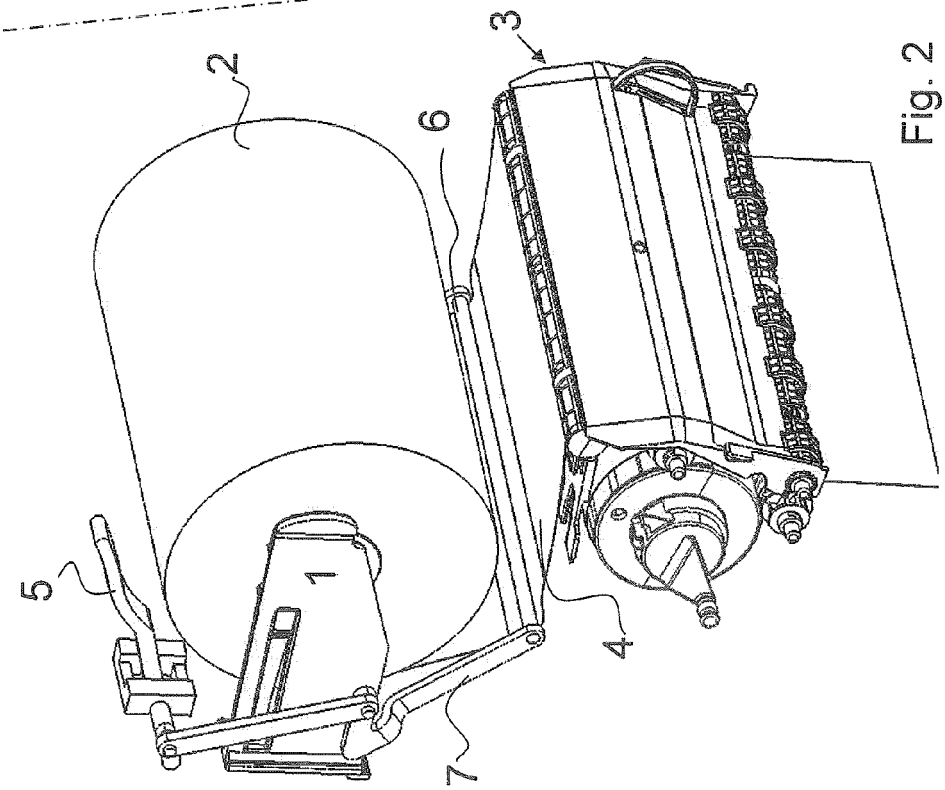


Fig. 2

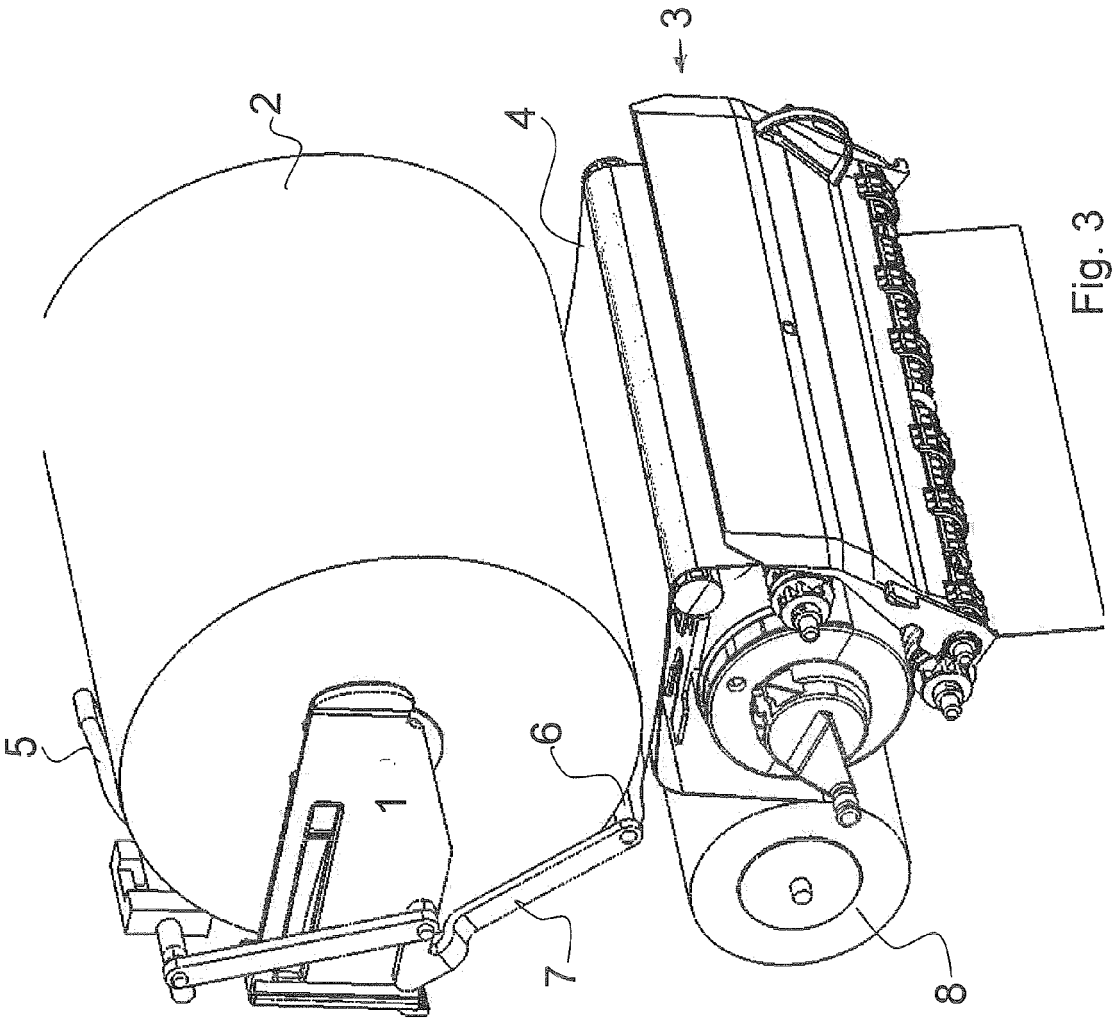


Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 09 39 7503

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 July 2009	Lopes, Claudia

CATEGORY OF CITED DOCUMENTS

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