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(54) **Touch-free toilet-seat paper dispensing device**

(57) Touch-free toilet-seat paper dispensing device comprising a case (13) containing toilet-seat papers (10), a mounting plate (5) fixed to the inside of the door of the case (13), and an electronic unit (9), a motor, a paper supply roller (3) mounted uniaxially with the motor, as well as a microswitch and a microswitch activating cam located on the mounting plate (5).

The case (13) is wall-mountable and is equipped with an openable door and an opening on its lower part. A sensor (1) is installed in the door of the case (13), and the folded toilet-seat papers (10) are fixed in the case (13) on the side opposite to the door.

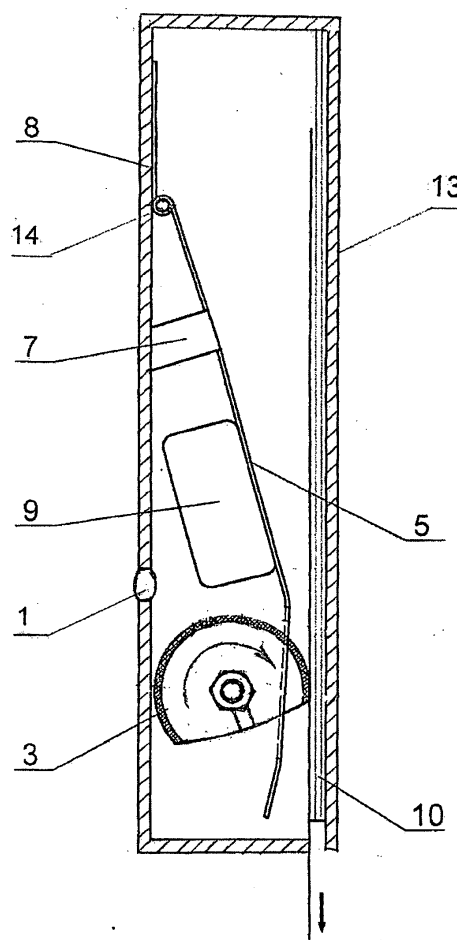


Figure 3

Description

[0001] The invention relates to a touch-free toilet-seat paper dispensing device.

In practice there is a huge need to improve the hygiene level of toilets, especially public toilets. Within this field one of the most important things is to keep the toilet seat clean.

[0002] The solutions known from practice include a device operated by a spring mechanism, which discharges a paper towel or toilet-seat paper when a handle is pulled down. In the case of such solutions the paper towels or toilet-seat papers to be dispensed are in stacks or rolls. The disadvantage of this solution is that on the one hand the person using the toilet has to touch the operating handle that has been touched by the persons using the toilet before him/her, that is this solution fails to meet the hygiene requirements. On the other hand, the device often malfunctions in such a way that one side of the paper gets stuck and is torn when extracted, then the user pulls down the handle again, using more paper than he/she really needs.

[0003] US Patent No. 4,856,694 relates to a paper shifting apparatus for toilet seats. The essence of the invention is that a supply case containing toilet-seat covering paper is installed on one side of a toilet bowl, the paper is threaded through a pair of supply rollers and laid on the toilet seat.

The used toilet-seat paper is moved to a take-up case installed on the other side of the toilet bowl by means of a pair of take-up rollers. These rollers are mechanically coupled with a motor driving the rollers and equipped with a power switch. When the power switch is pushed, the motor starts and rotates the rollers.

The disadvantage of this solution is that too much paper is used, and also hygiene is not fully provided, as the user has to touch a push button.

[0004] US Patent No. 4,106,135 relates to a water closet basin assembly dispensing paper suitable for covering the seat of the basin, which is placed proximate to the basin and dispenses paper from a roll mounted on a spool, discharging it through an opening and cutting it to proper size by means of a spring-operated cutter device. The spring-operated cutter device is mechanically connected to a sprocket wheel causing the rotation of the spool of the paper roll.

This solution is economical from the point of view of paper use, but the construction of the assembly is quite complicated.

[0005] The aim of the invention is, by eliminating the deficiencies of the known solutions, to provide an easy to use, economical, low cost, simple to install device that meets the hygiene requirements maximally.

[0006] The idea of the invention comes from the recognition that in toilets the main source of infection is the common use of the toilet seat and that all users touch the same toilet articles, handles. This source of infection can be eliminated, if paper is placed on the toilet seat,

and the paper is dispensed in such a manner that there is no need to touch a push button or handle on the toilet-seat paper dispensing device.

[0007] The aim can be achieved by means of a device that dispenses a toilet-seat paper in such a way that a sensor activates a paper supply roller, which presses against the papers, and as the roller rotates, it takes a paper and discharges it. The user needs to touch only the dispensed toilet-seat paper.

[0008] Thus, the invention relates to a touch-free toilet-seat paper dispensing device, the main parts of which are a case containing toilet-seat papers, a mounting plate fixed to the wall of the case, and an electronic unit, a motor, a paper supply roller mounted uniaxially with the motor, as well as a microswitch and a microswitch activating cam located on the mounting plate.

The case is wall-mountable and is equipped with an openable door and an opening on its lower part. A sensor is installed in the door of the case, and the folded toilet-seat papers are fixed in the case on the side opposite to the door.

In the case the **specially shaped mounting plate equipped with supporting tabs** is connected to the door with a shaft. **The supporting tabs are preferably continuously joined to the mounting plate, and are perpendicular to it.** The supporting tabs prevent the mounting plate from coming into full contact with the door, therefore the mounting plate can flexibly bend at the supporting points.

[0009] The shape of the paper supply roller is a truncated cylinder cut by a plane parallel to the generators, and the curved surface thereof is coated with rubber.

In idle state the non-rubber coated part of the roller is parallel to the papers and is not in contact with them. In active state, when the roller makes a 360 degree rotation, the rubber coated part presses against the papers, takes a paper and discharges it through the opening of the case.

The mounting plate is preferably connected to the door of the case by means of a fixing plate.

[0010] The touch-free toilet-seat paper dispensing device according to the invention is now described in more detail with reference to the following drawings, wherein

Figure 1 is a front view of the mounting plate of the device according to the invention;

Figure 2 is a side view of the device according to the invention in idle state;

Figure 3 is a side view of the device according to the invention in active state.

[0011] Figure 1 shows the mounting plate 5 connected to a fixing plate 8 with a shaft 14. There are two supporting tabs 7 on the mounting plate 5 near the shaft 14.

An electronic unit 9 and a motor 4 are mounted on the mounting plate 5. A paper supply roller 3 is connected to the shaft of the motor 4. The paper supply roller 3 has a special shape, it is not a regular cylinder, as ca. 30 % of

it is cut off by a plane parallel to the generators of the cylinder.

The curved surface of this specially shaped paper supply roller 3 is coated with rubber, while the non-curved part is not. An aperture is formed in the mounting plate 5 for the paper supply roller 3. The rubber coated part of the paper supply roller 3, by moving through the cut aperture, can press against the toilet-seat papers. The common shaft of the paper supply roller 3 and the motor 4 is fixed to tabs continuously joined to, perpendicularly bent from the side edge of the mounting plate 5 and the edge of the cut aperture. A microswitch 6 is fixed on the perpendicularly bent tab of the mounting plate 5 in a releasable manner. A microswitch activating cam 2 is installed on the paper supply roller 3.

[0012] Figure 2 shows the case 13, the door of which is equipped with a sensor 1. The papers 10 are fixed in the case 13 on the opposite side in a vertical position. The papers 10 are stacked on top of each other and are specially folded. The figure shows the fixing plate 8 connected to the door of the case 13, and the mounting plate 5 connected to it with a shaft 14. The figure also shows that the mounting plate 5 rests on the door by means of the supporting tabs 7 in such a manner that the larger part of the mounting plate 5 is unsupported.

The figure illustrates well the shape of the mounting plate 5 with two slight bends, and its position in the case 13. The figure shows the device according to the invention in idle state (rest state). Then the non-rubber coated part of the paper supply roller 3 is parallel to the toilet-seat papers 10, and is not in contact with them.

[0013] Figure 3 shows the device according to the invention in operation, when the paper supply roller 3 makes a full rotation. Then the rubber coated part of the paper supply roller 3, moving beyond the plane of the mounting plate 5 through the cut aperture, presses against the papers 10. As the paper supply roller 3 rotates, it takes a paper 10. Upon making a full rotation, the non-rubber coated part of the paper supply roller 3 faces the papers 10 again, that is it returns to idle state. The free movement of the paper supply roller 3 is ensured by the mounting plate 5, which acts as a plate spring in such a manner that at the points supported by the supporting tabs 7 the free end of the mounting plate 5 can flexibly bend.

[0014] The electrical connection of the device according to the invention is typically that the sensor 1 is in electrical connection with the electronic unit 9, and the electronic unit 9 with the motor 4.

The electricity required for the operation of the motor 4 is provided by a power source/supply unit located in the case 13 near the mounting plate 5. The power source is preferably a battery, accumulator.

[0015] In the case 13 of the device according to the invention the toilet-seat papers 10 are interfolded and stacked on top of each other. The toilet-seat papers 10 are connected to each other by perforated tabs.

Normally the device according to the invention is not ac-

tive, that is it is in idle state. Then the non-rubber coated part of the paper supply roller 3 faces the toilet-seat papers 10 in such a manner that there is no point of contact between the paper supply roller 3 and the papers 10.

If we move our hand in front of the sensor 1, the sensor 1 activates the electronic unit 9, which starts the motor 4, as a result of which the paper supply roller 3 starts to rotate, thus the rubber-coated part of the paper supply roller 3 comes into contact with the uppermost toilet-seat paper 10. The paper supply roller 3, as a result of its rotating-pressing motion, takes the one toilet-seat paper 10 with which the rubber-coated part of the paper supply roller 3 comes into contact, and tears it off along the perforated tabs. The microswitch activating cam 2 ensures that the motor 4 stops after the paper supply roller 3 makes a full rotation. As the paper supply roller 3 makes a 360 degree rotation, its rubber-coated part takes the one piece of paper 10 coming into contact with it, then the non-rubber coated part of the paper supply roller 3 faces the toilet-seat papers 10 again. The toilet-seat paper 10 is discharged through the opening of the case 13 to such an extent that it can be easily extracted by the user.

The device according to the invention is mounted on the wall of the toilet in such a manner that the sensor 1 senses only deliberate actions.

[0016] The solution according to the invention ensures the reliable operation of the device irrespective of the quantity of toilet-seat papers 10.

[0017] Although the solution according to the invention relates primarily to the dispensing of toilet-seat papers, this same solution can be used for dispensing paper towels and toilet paper in toilets.

Claims

1. A touch-free toilet-seat paper dispensing device comprising a case (13) equipped with a sensor (1), a corresponding electronic unit (9), toilet-seat papers (10) and a paper supply roller (3), wherein a specially shaped mounting plate (5) is fixed to the inside of the door of the case (13), which rests on the door by means of supporting tabs (7); the paper supply roller (3) is a truncated cylinder cut by a plane parallel to the generators, and the curved surface thereof is coated with rubber; furthermore the electronic unit (9) and a motor (4) mounted uniaxially with the paper supply roller (3), as well as a microswitch (6) are fixed to the mounting plate (5).
2. The device according to claim 1, wherein the mounting plate (5) is connected with a shaft to a fixing plate (8) mounted on the door.
3. The device according to claim 1, wherein the paper supply roller (3) is equipped with a microswitch activating cam (2).

4. The device according to claim 1, wherein the toilet-seat papers (10) are interfolded, stacked on top of each other, and connected to each other by perforated tabs.

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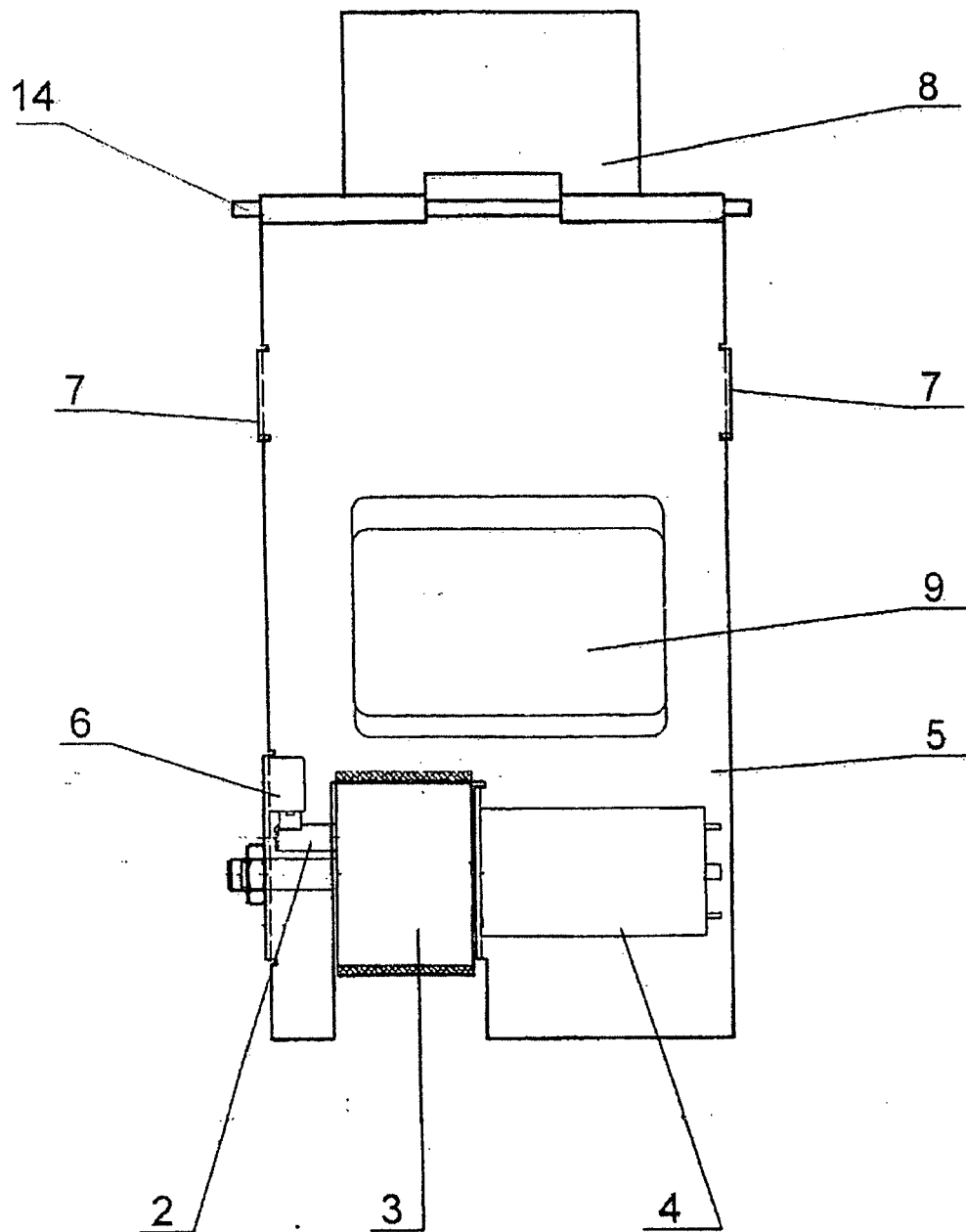


Figure 1

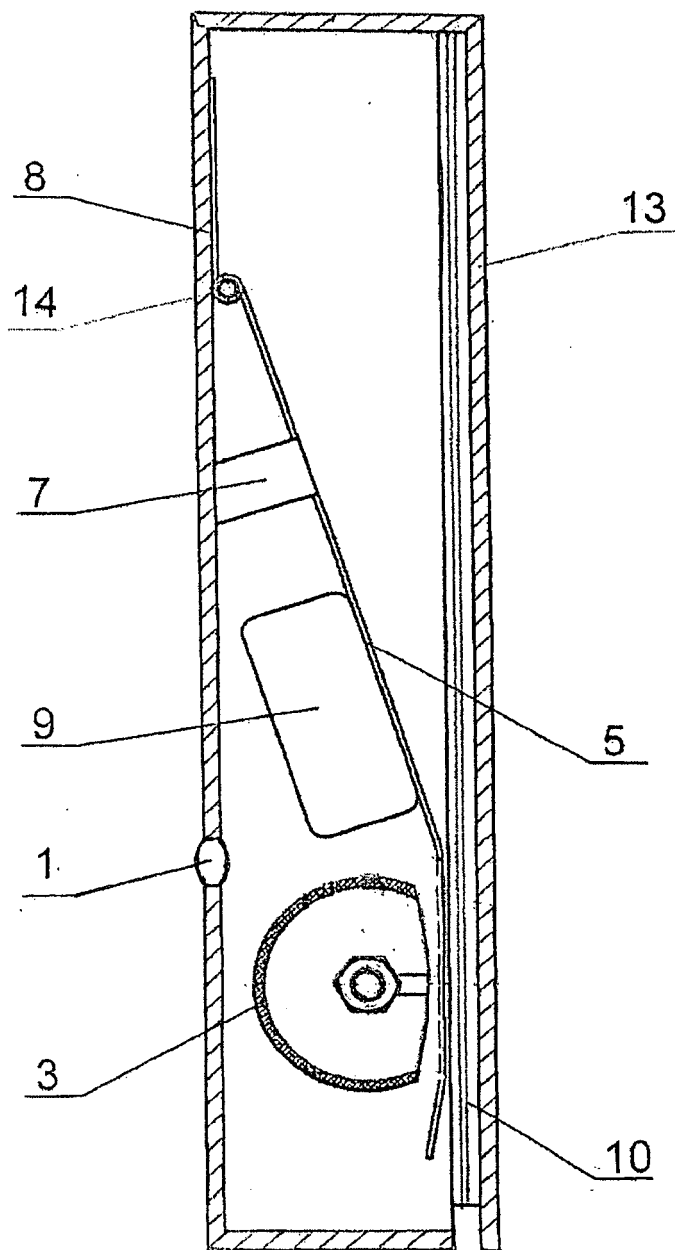


Figure 2

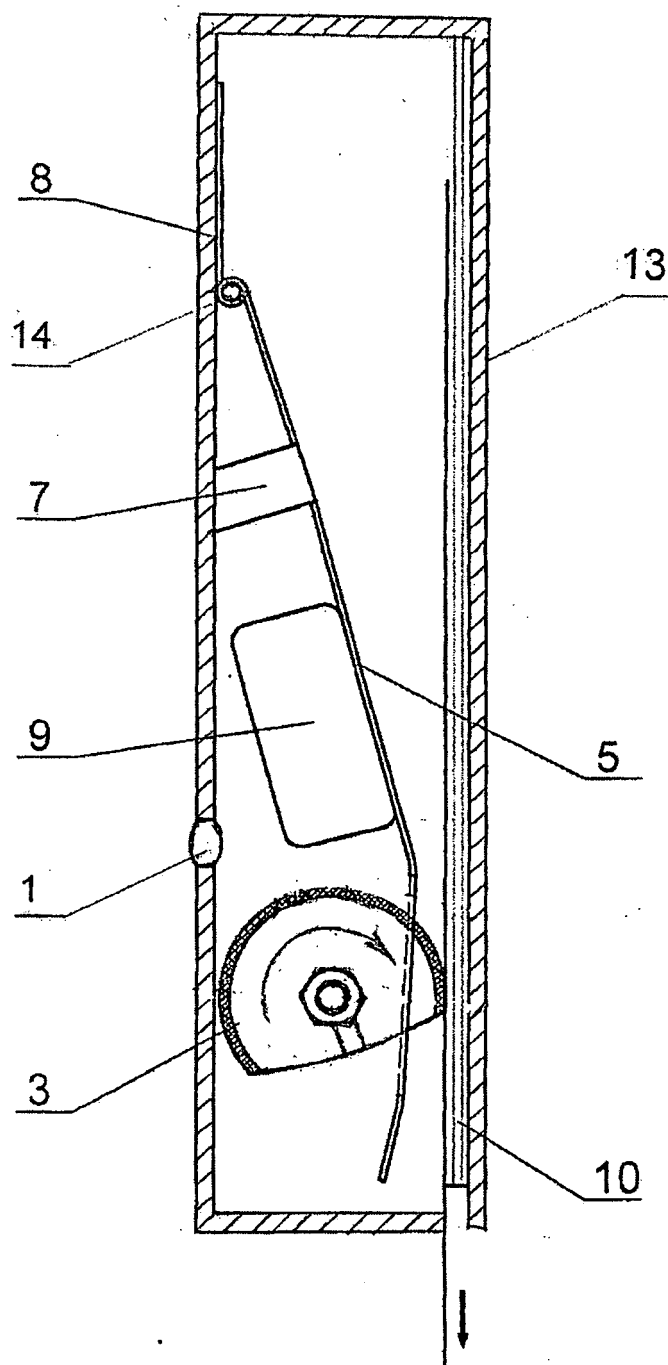


Figure 3



EUROPEAN SEARCH REPORT

Application Number
EP 11 00 3780

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 33 42 921 A1 (TRATZ LEONHARD) 5 June 1985 (1985-06-05) * the whole document *	1,3,4	INV. A47K10/42 A47K13/16 A47K17/00
A	DE 296 22 548 U1 (BERNSTEIN STEFFEN [DE]) 31 July 1997 (1997-07-31) * the whole document *	1,3,4	
A	WO 97/20489 A1 (KASSAPIAN MICHEL [FR]) 12 June 1997 (1997-06-12) * the whole document *	1,4	
A	US 4 979 237 A (HAZAR MITCHELL M [US] ET AL) 25 December 1990 (1990-12-25) * column 3, line 38 - column 4, line 37; figures 11-14 *	1,4	
A	DE 33 22 331 A1 (ESSER MARTIN) 10 January 1985 (1985-01-10) * the whole document *	1,4	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A47K
Place of search Munich		Date of completion of the search 28 September 2011	Examiner Fajarnés Jessen, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 00 3780

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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28-09-2011

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