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(54) **WATER-BEARING HOUSEHOLD APPLIANCE AND METHOD FOR OPERATING A WATER-BEARING HOUSEHOLD APPLIANCE**

(57) The invention relates to a water-bearing household appliance (1), particularly a dishwasher or a washing machine, with an automatic dosing system (15) for automatically dosing at least one detergent tablet provided by a dosing unit (18, 118, 218) into washing liquor for washing articles, comprising a receiving portion (16) and a driving unit (17), wherein the dosing unit (18, 118, 218) comprises a dosing device (20, 120, 220) for dosing the at least one detergent tablet and a storage cartridge (30, 130, 230) for storing a plurality of the detergent tablets, wherein the receiving portion (16) is configured to removably receive the dosing unit (18, 118, 218), the dosing device (20, 120, 220) is attached to the storage cartridge (30, 130, 230) and is configured for picking the at least one detergent tablet from the plurality and releasing the at least one detergent tablet by temporarily switching by a predefined switching mechanism from a closed state to a release state, wherein the dosing device (20, 120, 220) comprises a safety portion (24, 124, 224) for preventing an unwanted switching, wherein the driving unit (17) is configured for switching the dosing device (20, 120, 220) by using the predefined switching mechanism for dosing the detergent tablet.

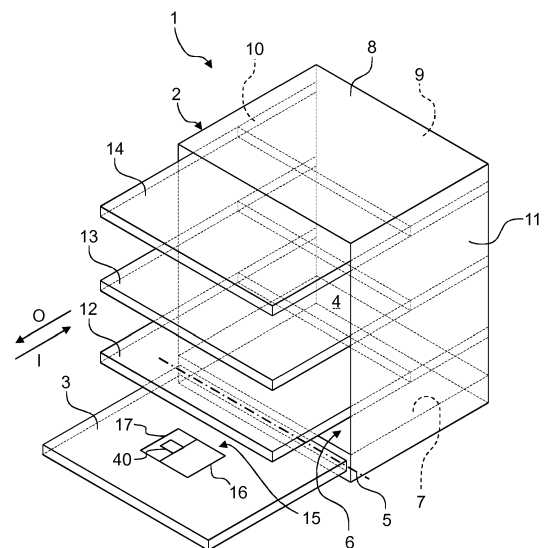


Fig. 1

## Description

**[0001]** The invention relates to a water-bearing household appliance, in particular a dishwasher or a washing machine, and a method for operating a water-bearing household appliance.

**[0002]** Known household appliances, for example dishwashers or washing machines, typically have a dosing system that consists of a chamber for storing a single dose of detergent. The user of the dishwasher has to fill the chamber with the detergent each time before starting a washing cycle. This is inconvenient for the user. Furthermore, such systems bear the risk that the user does not fill in the correct amount of detergent or forgets to fill in detergent at all. This can lead to bad or undesirable cleaning results. It is desired that an automatic dosing system is available, which automatically doses the correct amount of detergent at the correct timings during a washing cycle.

**[0003]** Detergents for dishwashers or washing machines can be irritating or harmful, particularly when they come into contact with skin or the eyes of a user. In particular, detergents for an automatic dosing unit may have a specific chemical formulation that allows a higher efficiency, for example by increasing a concentration of active agents. In order to protect the user of the automatic dosing unit it is desired to block easy access to the interior of the dosing unit.

**[0004]** It is an objective of the invention to provide an improved water-bearing household appliance.

**[0005]** According to a first aspect, a water-bearing household appliance, particularly a dishwasher or a washing machine, with an automatic dosing system for automatically dosing at least one detergent tablet provided by a dosing unit into washing liquor for washing articles is suggested. The automatic dosing system comprises a receiving portion and a driving unit. The dosing unit comprises a dosing device for dosing the at least one detergent tablet and a storage cartridge for storing a plurality of the detergent tablets. The receiving portion is configured to removably receive the dosing unit. The dosing device is attached to the storage cartridge and is configured for picking the at least one detergent tablet from the plurality and releasing it by temporarily switching by a predefined switching mechanism from a closed state to a release state. A safety portion of the dosing device is configured for preventing an unwanted switching. The driving unit is configured for switching the dosing device by using the predefined switching mechanism for dosing the at least one detergent tablet.

**[0006]** This water-bearing household appliance has the advantage that multiple washing cycles can be performed without the need that a user (re-)fills the detergent for each cycle. Further, a proper amount of detergent can automatically be provided, that is, when the articles to be washed, such as dishes or clothes, are relatively clean, a small amount may be sufficient, for example a single detergent tablet, and when the articles are relatively dirty,

a larger amount may be necessary for obtaining a good cleaning result, for example three detergent tablets. This can be convenient for a user. When the storage cartridge runs out of detergent tablets, the user can simply replace the storage cartridge or the whole dosing unit.

**[0007]** Further, the dosing unit has the advantage that the dosing device cannot be switched from the closed state, which is the normal state, to the release state in which detergent tablets may be released and access to the interior of the dosing unit is possible, by using bare hands and/or simple tools. Simple tools are, for example, tools that are available in a common DIY-store. These comprise, for example, screwdrivers, knives, scissors, wrenches and/or pliers. Therefore, the dosing unit is safe to be handled by users. In particular, even if a child finds such a dosing unit and plays with it, it is ensured that the child cannot accidentally open the dosing unit, that is, switch it from the closed state to the release state, and get access to the stored detergent tablets.

**[0008]** The receiving portion of the automatic dosing system is arranged in the water-bearing household appliance such that the dosing unit will be oriented according to a preferred orientation when the water-bearing household appliance is set up as intended for use. In particular, a relative orientation with respect to a gravitational vector is predetermined when the dosing unit is placed in the receiving portion.

**[0009]** The dosing unit may comprise more elements beside the dosing device and the storage cartridge. Preferably, the elements of the dosing unit are made of a plastic material that can be processed by injection moulding. However, some parts or elements of the dosing device may be made of metal, ceramics and/or a composite material.

**[0010]** The dosing device has the function to seal the storage cartridge from the environment, preferably such that humidity cannot enter the storage cartridge, because this might lead to degradation of the detergent tablets stored in there. Further, the dosing device has the function to selectively release a predetermined number of detergent tablets, preferably a single detergent tablet, each time the dosing unit is actuated. For this, the dosing device may involve a number of interacting mechanical elements that allow picking of the at least one detergent tablet from the storage cartridge and releasing the at least one detergent tablet from the dosing unit. The dosing device is preferably attached to the storage cartridge such that it cannot be removed without breaking the dosing unit.

**[0011]** In order to release the at least one detergent tablet, the dosing device has at least two distinct states, which can be defined by a certain arrangement of the mechanical elements of the dosing device relative to each other. The at least two distinct states are called closed state and release state. In the closed state, the dosing unit is closed to the environment, preferably it is sealed impermeable to fluids of all kinds in the closed state. The dosing unit may comprise a sealing portion,

for example a rubber seal. In the release state, the at least one detergent tablet is released from the dosing unit. When the dosing device is in the release state, there may be a path from the environment to the inside of the dosing unit. In the following, the dosing unit is called to be in the closed state when the dosing device is in the closed state and the dosing unit is called to be in the release state when the dosing device is in the release state.

**[0012]** The dosing device is preferably switched from the closed state to the release state by using a predefined switching mechanism. The predefined switching mechanism involve a number of manipulations performed on the dosing device, for example. In its intended use, the dosing unit is placed in an automatic dosing system of a water-bearing household appliance, wherein the automatic dosing system is configured for performing the manipulations, that is, to switch the dosing device by using the predefined switching mechanism.

**[0013]** Preferably, the predefined switching mechanism involves employing a specific tool. The specific tool is specifically adapted for switching the dosing device. In particular, the specific tool has features that are not found in common tools as described above. Particularly, the specific tool is part of the driving unit, such that the driving unit can perform switching by using the predefined switching mechanism.

**[0014]** The dosing unit is switched to the release state only temporarily, that is, it remains in the release state only for a predetermined, preferably short, period, for example less than 15 seconds. After the predetermined period, the dosing unit returns to the closed state, for example by switching back. Switching back does not necessarily mean that the predefined switching mechanism is employed, other ways are possible as well. By this, it is ensured that interior of the dosing unit is not exposed to the environment excessively. The dosing unit may comprise a covering means, such as lid, that temporarily blocks a path into the dosing unit when the dosing device is in the release state in order to reduce an input of humidity during release.

**[0015]** A safety portion of the dosing unit prohibits easy switching of the dosing unit from the closed state to the release state by using the predefined switching mechanism. In that sense, the safety portion acts as a barrier against switching. The safety portion is designed such that the dosing device cannot be switched from the closed state to the release state with bare hands and/or simple tools, as described above. That is, the safety portion prevents a user to access the interior of the dosing unit by using the predefined switching mechanism without the specific tool.

**[0016]** The specific tool is in particular prepared for switching the dosing device from the closed state to the release state. For this, the specific tool has, for example, a corresponding form. The specific tool can therefore be considered as a key for unlocking the safety portion in order to switch the dosing device to the release state.

**[0017]** In its intended use, the dosing unit is placed in the automatic dosing system of the water-bearing household appliance. The automatic dosing system comprises a driving unit that is configured for actuating the dosing unit for releasing the at least one detergent tablet. For this, the automatic dosing system particularly comprises the specific tool.

**[0018]** According to an embodiment, the dosing unit is arranged in the receiving portion.

**[0019]** According to a further embodiment, the safety portion of the dosing unit is configured such that a force for switching the dosing device from the closed state to the release by using the predefined switching mechanism state is applicable by a specific tool comprised in the driving unit.

**[0020]** In particular, the force for switching by using the predefined switching mechanism is a lower force than when the dosing is switch by using a different switching mechanism than the predefined switching mechanism.

**[0021]** For example, shallow indents that do not have sharp edges do not provide a possibility to position a common tool in a way such that a sufficient force or torque can be applied to the dosing device. However, the specific tool is, for example, formed corresponding to the shallow indents, thus being able to engage on a large area, such that a total force that is applicable by using the specific tool adds up over the whole area and becomes sufficient for the switching by using the predefined switching mechanism.

**[0022]** According to a further embodiment, the dosing device comprises a plug which is configured to be moved from a first position, in which the dosing device is in the closed state, to a second position, in which the dosing device is in the release state, by turning the plug about a turning axis, wherein the safety portion comprises an engagement section on a surface of the plug for engagement with the specific tool for exerting a torque for turning the plug.

**[0023]** In this embodiment, the predefined switching mechanism involves particularly using the specific tool for turning the plug.

**[0024]** According to a further embodiment, the engagement section formed in the plug is implemented as a spiral indent and the specific tool comprises a corresponding spiral projection.

**[0025]** The spiral preferably begins in a center of rotation of turning the plug. By using a common tool, such as a screwdriver, it is only possible to apply a force radially with respect to the center of rotation, which does not provide any torque in the turning direction, because the edges of the spiral indent are essentially perpendicular to a radial direction at any position of the spiral. Further, if the spiral has an end-point, the may be a small portion at the end-point that allows to transfer a torque on the plug. Preferably, in this case, the plug is designed such that turning the plug by applying a torque via the end-point of the spiral, which is possible only in a predefined direction, will lead to drive the plug towards the first position, which

is the closed state of the dosing device.

**[0026]** In embodiments, the spiral indent is formed in the specific tool and the spiral projection is formed in the plug.

**[0027]** According to a further embodiment, the dosing device comprises a buckler which is configured to be moved from a first position, in which the dosing device is in the closed state, to a second position, in which the dosing device is in the release state, by laterally dislocating the buckler in a pulling direction, wherein the safety portion is embodied as a surface of the buckler facing away from the storage cartridge having surface normal including an angle to the pulling direction of maximally 60°.

**[0028]** In this embodiment, the predefined switching mechanism involves pulling the buckler in the pulling direction. The special geometry of the buckler's surface forms the safety portion in this case. It has the effect that when applying a force that can regularly be expected, it is not possible for a user to grip the buckler with his hands or even with pliers and apply a sufficient pulling force for moving the buckler and switching the dosing device.

**[0029]** In order to move the buckler in the pulling direction, a force needs to be applied in that direction. When the buckler is gripped on opposite sides, a gripping force applied will be split by the inclined surface of the buckler into a force component normal to the surface and a force component parallel to the surface, perpendicular to the normal component. The force component parallel to the surface leads to sliding of the gripping tool when that component is larger than an adhesion force between the gripping tool and the surface. Thus, a force in the pulling direction cannot be applied.

**[0030]** Preferably, the angle between the surface normal and the pulling direction is smaller than 60°, for example 45° or only 30°. The smaller the angle, the stronger the protection against unwanted switching. Preferably, the angle between the surface normal and the pulling is smaller than the specified value at any position on the surface of the buckler facing away from the storage cartridge.

**[0031]** For example, the buckler has a pyramidal shape with a polygonal base, such as a triangle. Preferably, the base is a regular polygon.

**[0032]** According to a further embodiment, the buckler has a conical formed surface.

**[0033]** Conical surfaces are preferred because opposite sides of the buckler are symmetrically shaped according to a symmetry axis of the cone, thus a force applied for gripping is even on both sides.

**[0034]** According to a further embodiment, the safety portion includes a surface having a low coefficient of friction, in particular less than 0.2, with respect to metal, wood, organic substances and plastics.

**[0035]** The coefficient of friction may be defined as a dimensionless number which defines the relation between a normal force applied between a first body, for example an element of the dosing unit, and a second

body, for example a tool, and a maximum adhesion force counteracting a sliding relative movement between the bodies. The coefficient of friction may be defined according to Equation (1) below.

$$F_f = \mu \times F_N \quad \text{Equation (1)}$$

**[0036]** In Equation (1),  $F_f$  denotes the adhesion force,  $\mu$  denotes the coefficient of friction and  $F_N$  denotes the normal force.

**[0037]** According to a further embodiment, the safety portion is configured to lock the dosing device in the closed state.

**[0038]** In this embodiment, the predefined switching mechanism involves unlocking the safety portion, such that the switching can be performed with ease. In particular, the specific tool is part of the automatic dosing system and may be implemented to unlock the safety portion. For example, when the dosing unit is placed in the receiving portion of the automatic dosing system, the specific tool engages with the dosing unit and unlocks the safety portion.

**[0039]** According to a further embodiment, the safety portion is implemented as a mechanical restraint device.

**[0040]** In particular, the safety portion is arranged in form closure with the dosing device. In this embodiment, the safety portion may not be easily removed from the dosing unit, because there is no space for common tools to be positioned so as to act on the safety portion. Particularly, the safety portion is implemented as lock for locking the dosing unit in the closed state.

**[0041]** For example, the safety portion blocks a movement of the dosing device or an element of the dosing device in the predefined switching mechanism. Then, in order to perform the switching, the safety portion has to be unlocked, for example by shifting the safety portion and/or by releasing the form fit. In particular, the specific tool is implemented for unlocking the safety portion. Preferably, the specific tool unlocks the safety portion when the dosing unit is placed in the automatic dosing system.

**[0042]** According to a second aspect of the invention, a method for operating a water-bearing household appliance, specifically a dishwasher or washing machine, is suggested. The water-bearing household appliance comprises an automatic dosing system for automatically dosing a detergent tablet provided by a dosing unit into washing liquor for washing articles. In a first step, the dosing unit is installed in the automatic dosing system. This may involve both user interactions as well as automatically driven arranging interactions between the automatic dosing system and the dosing unit. In a second step, driving means of a driving unit engage with a dosing device of the dosing unit. In a third step, the dosing device is switched from a closed state to a release state by using a predefined switching mechanism by the driving unit. For example, as a result, at least one detergent tablet of

the plurality is released from the dosing unit, thus being dosed into washing liquor, for example.

**[0043]** This method is preferably performed with a water-bearing household appliance according to the first aspect. The method may comprise further steps and/or the steps may be followed in an order different than presented here.

**[0044]** In an embodiment, a specific tool is employed in the switching step.

**[0045]** In a further embodiment, the method comprises unlocking a safety portion of the dosing device for preventing an unwanted switching.

**[0046]** Particularly, the specific tool is used for unlocking the safety portion.

**[0047]** The invention has been described in terms of different embodiments. It is to be understood that one or more features of any one embodiment may be combinable with one or more features of the other embodiments. In addition, any single feature or combination of features in any of the embodiments may constitute additional embodiments. Further embodiments or aspects of the invention are subject to the depending claims and the examples which are described in the following with reference to the figures.

Fig. 1 shows a schematic perspective view of an example of a water-bearing household appliance;

Fig. 2 shows a schematic of a first example of a dosing unit;

Fig. 3 shows a schematic of a second example of a dosing unit;

Fig. 4 shows a schematic of a third example of a dosing unit; and

Fig. 5 shows a schematic block diagram of an example of a method for operating a water-bearing household appliance.

**[0048]** In the figures, like elements are denoted with the same reference numerals unless otherwise indicated.

**[0049]** Fig. 1 shows a schematic perspective view of an example of a water-bearing household appliance 1, which is implemented as a domestic dishwasher. The domestic dishwasher 1 comprises a tub 2, which can be closed by a door 3. Preferably, the door 3 seals the tub 2 so that it is waterproof, for example by using a door seal between door 3 and the tub 2. Preferably, the tub 2 has a cuboid shape. Tub 2 and door 3 can form a washing chamber 4 for washing dishes.

**[0050]** In Fig. 1, door 3 is shown in the open position. By swiveling about an axis 5 at a lower edge of door 3, the door 3 can be opened or closed. With the door 3, an opening 6 of the tub 2 for inserting dishes into the washing chamber 4 can be opened or closed. Tub 2 comprises a

lower cover 7, an upper cover 8 facing the lower cover 7, a rear cover 9 facing the closed door 3 and two side covers 10, 11 which face each other. For example, the lower cover 7, the upper cover 8, the rear cover 9 and the two side covers 10, 11 can be made from stainless steel sheets. Alternatively, at least one of the covers, for example the lower cover 7, can be made from a polymeric material, such as plastic.

**[0051]** The domestic dishwasher 1 further has at least one rack 12, 13, 14 on which dishes to be washed can be placed. Preferably, more than one rack 12, 13, 14 is used, wherein rack 12 can be lower rack, rack 13 can be an upper rack and rack 14 can be a rack specific for cutlery. As is shown in Fig. 1, the racks 12 to 14 are arranged vertically above each other in the tub 2. Each rack 12, 13, 14 can be pulled out from the tub 2 in a first direction O or pushed into the tub 2 in a second direction I.

**[0052]** Fig. 1 further shows an automatic dosing system 15 that is arranged in the door 3 of the domestic dishwasher 1. The automatic dosing system 15 comprises a receiving portion 16 that is arranged to accept a dosing unit 18, 118, 218 (see Figs. 2 to 4). Further, the automatic dosing system 15 has a driving unit 17 configured to drive the dosing unit 18, 118, 218 for automatically dosing a detergent tablet stored in a storage cartridge 30, 130, 230 (see Fig. 2 to 4) of the dosing unit 18, 118, 218.

**[0053]** The receiving portion 16 is arranged such that the dosing unit 18, 118, 218 is oriented according to a predetermined alignment relative to a gravitational vector when the door 3 is in the closed position and the domestic dishwasher 1 is set up as intended for use. Particularly, the orientation is such that the gravitational force acting on each of the detergent tablet may be employed during the dosing. For example, when the dosing unit 18, 118, 218 is switched from the closed to the release state, the detergent tablet will fall out of the dosing unit 18, 118, 218 due to gravitation. The receiving portion 16 may comprise a receiving chamber (not shown) for installing the dosing unit 18, 118, 218, which may be accessed by a door (not shown), separating it from the washing chamber 4.

**[0054]** The driving unit 17 preferably comprises driving means (not shown) for engaging with the dosing unit 18, 118, 218 that allows switching of the dosing unit 18, 118, 218 by using a predefined switching mechanism. Examples of this switching are explained in the following referring to Figs. 2 to 4.

**[0055]** It is noted that the automatic dosing system 15 may advantageously be used in conjunction with a washing machine, which is another example of a water-bearing household appliance.

**[0056]** Fig. 2 shows a schematic of a first example of a dosing unit 18 comprising a dosing device 20 and a storage cartridge 30. In this example, the dosing unit 18 has an elongated cylindrical shape. The dosing unit 18 is configured for releasing a detergent tablet (not shown) provided by the storage cartridge 30 by being turned

about a rotational axis X, which is a symmetry axis of the cylinder in this example.

**[0057]** In particular, the dosing device 20 has an internal design (not shown), that allows to pick up a detergent tablet from the storage cartridge 30 and place it in a release chamber (not shown) inside of the dosing device 20 arranged above an outlet 26 that is arranged on a side wall of the dosing device 20 and is facing down in Fig. 2. The dosing unit 18 is shown in the closed state, in which the outlet 26 is blocked by a plug 22.

**[0058]** The plug 22 is arranged in the dosing device 20 such that it can be turned about the axis X relative to the periphery of the dosing device 20. For example, the plug 20 comprises a threaded portion on at least a section of an outer surface of the plug 20, which is engaged with a corresponding threaded portion formed in the dosing device 20. By turning the plug 20, the plug 20 will be driven along the axis X. Thus, by turning the plug 20, the detergent tablet placed in the internal release chamber will be set free when the outlet 26 is cleared by the plug 22.

**[0059]** On the front face of the plug 22 a safety portion 24 is formed as a spiral indent. The spiral indent 24 begins in the center, where the rotational axis X crosses the front face of the plug 20. The spiral indent 24 ends at an end-point 25. The spiral structure does not allow a torque to be transferred to the plug 22 in a direction that can drive the plug 22 out of the dosing device 20 by simple tools. In particular, when a tangential force is exerted on the end-point 25, a torque on the plug 22 is created which drives the plug 22 further into the dosing device 20. Thus, this will not result in switching the dosing device 20 from the closed state to the release state, in which the detergent tablet is released via the outlet 26.

**[0060]** A specific tool 40 (see Fig. 1) that engages with the spiral indent 24, in particular a tool that has a corresponding spiral shape, allows to apply a torque in the correct turning direction for switching the dosing device 20 from the closed state to the release state. The specific tool 40 is part of the driving unit 17 of the automatic dosing system 15 (see Fig. 1).

**[0061]** In this example, the predefined switching mechanism comprises turning the plug 22 by using the specific tool 40 that has a corresponding shape for engaging with the safety portion 24 formed on the surface of the plug 22.

**[0062]** Fig. 3 shows a schematic of a second example of a dosing unit 118 comprising a dosing device 120 and a storage cartridge 130. The dosing device 120 comprises a pre-dosing element 121 and a buckler 122. Particularly, the pre-dosing element 121 is configured to pick up a detergent tablet provided by the storage cartridge 130. By pulling the dosing device 120 in the direction indicated by arrow P, the dosing device 120 is switched from the closed state to the release state, that is, the detergent tablet picked up by the pre-dosing element 121 is released.

**[0063]** In this example, the safety portion 124 is provided by the buckler 122, which has a surface that does not allow gripping of the buckler 122. In particular, the

surface 124 is implemented such that it does not allow a force to be exerted in the direction of arrow P by gripping due to its orientation. Specifically, a surface normal N of the surface 124 of the buckler 122 that is facing away from the storage cartridge 130 includes an angle A with the pulling direction P that is less than 60°, preferably less than 45°. The lower the angle A, the harder it is to grip the buckler 122. Preferably, the surface 124 has a smooth finishing, such that a surface roughness is low and a firm grip on the surface 124 is hard to achieve.

**[0064]** A specific tool 40 (see Fig. 1) may be used for pulling the dosing device 120 into the direction P in order to release a detergent tablet. For example, the specific tool 40 may use a suction portion that adheres to the surface 124 of the buckler 122 and thus allows to pull the dosing device 120. The specific tool 40 is part of the driving unit 17 of the automatic dosing system 15 (see Fig. 1).

**[0065]** The predefined switching mechanism particularly comprises pulling of the dosing device 120 in the direction P, wherein the total force that is applied to the dosing device 120 via the buckler 122 is essentially equal to the resulting force in the pulling direction P. For example, the total force is twice as large as the resulting pulling force. That is, if someone applies a strong force on the dosing unit 110 or the dosing device 120 that comprises a force component in the pulling direction P acting on the dosing device 120 that is strong enough for actually switching the dosing device 120 from the closed state to the release state, this is not considered as switching by using the predefined switching mechanism.

**[0066]** Fig. 4 shows a schematic of a third example of a dosing unit 218 comprising a dosing device 220 and a storage cartridge 230. The dosing device 220 is implemented such that the predefined switching mechanism may combine both lateral and angular dislocation of elements.

**[0067]** In particular, the dosing device 220 comprises a pre-dosing element 222 that is implemented for picking a single detergent tablet from the storage cartridge 230 and transporting it to a receiving chamber 227 formed in a release element 226. The release element 226 is, for example, arranged in the dosing device 220 such that it can be moved along a direction indicated by arrow P, which is also called a pulling direction. The dosing unit 218 is shown in the closed state in Fig. 4. For switching the dosing device 220 to the release state, the release element 226 has to be shifted or pulled in the pulling direction P. Then, the detergent tablet stored in the receiving chamber 227 will slide off the inclined surface of the receiving chamber 227 due to gravity, thus the detergent tablet is released.

**[0068]** A safety portion 224 is arranged between a fixed part 228 of the dosing device 220 and the release element 226. Particularly, the safety portion 224 is engaged with both the fixed part 228 and the release element 226, thus locking the release element 226 in the closed position as is shown in Fig. 4. In order to move the release element 226, the safety portion 224 must be unlocked, that is,

engagement with either one of the fixed portion 228 or the release element 226 has to be released.

**[0069]** For example, the safety portion 224 comprises a clipping portion made from plastic that allows flexible bending (not shown). The clipping portion engages with a corresponding portion on the release element 226 and/or the fixed portion 228. For example, the clipping portion is covered from the outside by the fixed portion 228 and is only reachable with a specific tool 40 (see Fig. 1). Then, the clipping portion may be pushed aside in order to release the engagement by the specific tool 40.

**[0070]** The specific tool 40 is formed in the automatic dosing system 15 (see Fig. 1) into which the dosing unit 210 is placed in its intended use, such that the dosing unit 210 is in an unlocked state when placed in the automatic dosing system 15 and is locked when removed from the automatic dosing system 15.

**[0071]** Fig. 5 shows a schematic block diagram of an example of a method for operating a water-bearing household appliance 1, for example the domestic dishwasher shown in Fig. 1 or a washing machine (not shown). In a first step S1, a dosing unit 18, 118, 218 (see Figs. 2 to 4) is installed in an automatic dosing system 15 (see Fig. 1) of the water-bearing household appliance 1. This may involve both user interactions as well as automatically driven arranging interactions between the automatic dosing system 15 and the dosing unit 18, 118, 218. In a second step S2, driving means of a driving unit 17 (see Fig. 1) engage with a dosing device 20, 120, 220 (see Figs. 2 to 4) of the dosing unit 18, 118, 218. In a third step S3, the dosing device 20, 120, 220 is switched from a closed state to a release state by using a predefined switching mechanism by the driving unit 17. For example, as a result of this step S3, at least one detergent tablet is released from the dosing unit 18, 118, 218, thus being dosed into washing liquor, for example.

**[0072]** While the present technology has been described in connection with several practical examples, it is to be understood that the technology is not to be limited to the disclosed examples, but on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the technology.

Reference Numerals:

**[0073]**

1	Water-bearing household appliance
2	Tub
3	Door
4	Washing chamber
5	Axis
6	Opening
7	Lower cover
8	Top cover
9	Rear cover
10	Side cover

11	Side cover
12	Rack
13	Rack
14	Rack
5 15	Automatic dosing system
16	Receiving portion
17	Driving unit
18	Dosing unit
20	Dosing device
10 22	Plug
24	Safety portion
25	End-point
26	Outlet
30	Storage cartridge
15 40	Specific tool
118	Dosing unit
120	Dosing device
121	Pre-dosing element
122	Buckler
20 124	Safety portion
130	Storage cartridge
218	Dosing unit
220	Dosing device
222	Pre-dosing element
25 224	Safety portion
226	Release element
227	Receiving chamber
228	Fixed portion
230	Storage cartridge
30 A	Angle
I	Inward direction
N	Surface normal
O	Outward direction
35 P	Pulling direction
S1	Method step
S2	Method step
S3	Method step
X	Turning axis
40	

## Claims

1. A water-bearing household appliance (1), particularly a dishwasher or a washing machine, with an automatic dosing system (15) for automatically dosing at least one detergent tablet provided by a dosing unit (18, 118, 218) into washing liquor for washing articles, comprising a receiving portion (16) and a driving unit (17), wherein the dosing unit (18, 118, 218) comprises a dosing device (20, 120, 220) for dosing at least one detergent tablet and a storage cartridge (30, 130, 230) for storing a plurality of the detergent tablets, wherein the receiving portion (16) is configured to removably receive the dosing unit (18, 118, 218), the dosing device (20, 120, 220) is attached to the storage cartridge (30, 130, 230) and is configured for picking the at least one detergent

- tablet from the plurality and releasing the at least one detergent tablet by temporarily switching by a predefined switching mechanism from a closed state to a release state, wherein the dosing device (20, 120, 220) comprises a safety portion (24, 124, 224) for preventing an unwanted switching, wherein the driving unit (17) is configured for switching the dosing device (20, 120, 220) by using the predefined switching mechanism for dosing the detergent tablet.
2. The water-bearing household appliance according to claim 1, wherein the dosing unit (18, 118, 218) is arranged in the receiving portion (16).
  3. The water-bearing household appliance according to claim 1 or 2, wherein the safety portion (24, 124, 224) is configured such that a force for switching the dosing device (20, 120, 220) from the closed state to the release state by using the predefined switching mechanism is applicable by a specific tool (40) comprised in the driving unit (17).
  4. The water-bearing household appliance according to claim 3, wherein the dosing device (20, 120, 220) comprises a plug (22) which is configured to be moved from a first position, in which the dosing device (20, 120, 220) is in the closed state, to a second position, in which the dosing device (20, 120, 220) is in the release state, by turning the plug (22) about a turning axis (X), wherein the safety portion (24, 124, 224) comprises an engagement section on a surface of the plug (22) for engagement with the specific tool (40) for exerting a torque for turning the plug (22).
  5. The water-bearing household appliance according to claim 4, wherein the engagement section is implemented as a spiral indent and the specific tool (40) comprises a corresponding spiral projection.
  6. The water-bearing household appliance according to any one of claims 1 to 5, wherein the dosing device (20, 120, 220) comprises a buckler (122) which is configured to be moved from a first position, in which the dosing device (20, 120, 220) is in the closed state, to a second position, in which the dosing device (20, 120, 220) is in the release state, by laterally dislocating the buckler (122) in a pulling direction (P), wherein the safety portion (24, 124, 224) is embodied as a surface of the buckler (122) that is facing away from the storage cartridge (30, 130, 230) having a surface normal (N) including an angle (A) to the pulling direction (P) of maximally 60°.
  7. The water-bearing household appliance according to claim 6, wherein the buckler (122) has a conical formed surface.
  8. The water-bearing household appliance according to any one of claims 1 to 7, wherein the safety portion (24, 124, 224) includes a surface having a low coefficient of friction, in particular less than 0.2, with respect to metal, wood, organic substances and plastics.
  9. The water-bearing household appliance according to any one of claims 1 to 8, wherein the safety portion (24, 124, 224) is configured to lock the dosing device (20, 120, 220) in the closed state.
  10. The water-bearing household appliance according to claim 9, wherein the safety portion (24, 124, 224) is implemented as a mechanical restraint device.
  11. A method for operating a water-bearing household appliance (1), specifically a dishwasher or a washing machine, with an automatic dosing system (15) for automatically dosing at least one detergent tablet provided by a dosing unit (18, 118, 218) into washing liquor for washing articles, with  
Installing (S1) the dosing unit (18, 118, 218) in the automatic dosing system (15),  
Engaging (S2) driving means of a driving unit (17) with a dosing device (20, 120, 220) of the dosing unit (18, 118, 218), and  
Switching (S3) the dosing device (20, 120, 220) from a closed state to a release state by using a predefined switching mechanism by the driving unit (17).
  12. The method according to claim 11, wherein a specific tool (40) is employed in the switching step (S3).
  13. The method according to claim 11 or 12, further comprising unlocking a safety portion (24, 124, 224) of the dosing device (20, 120, 220) for preventing an unwanted switching.



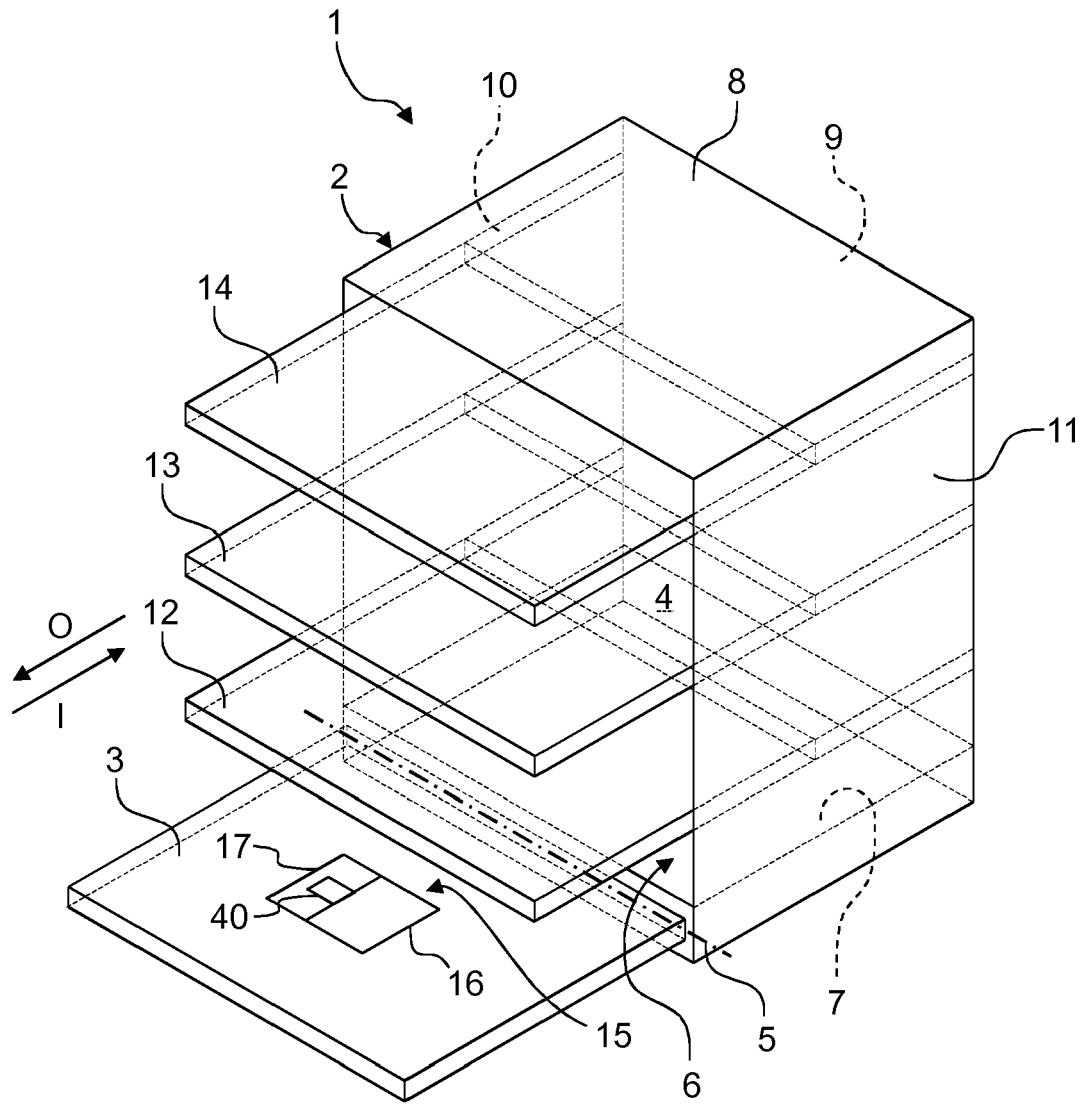


Fig. 1

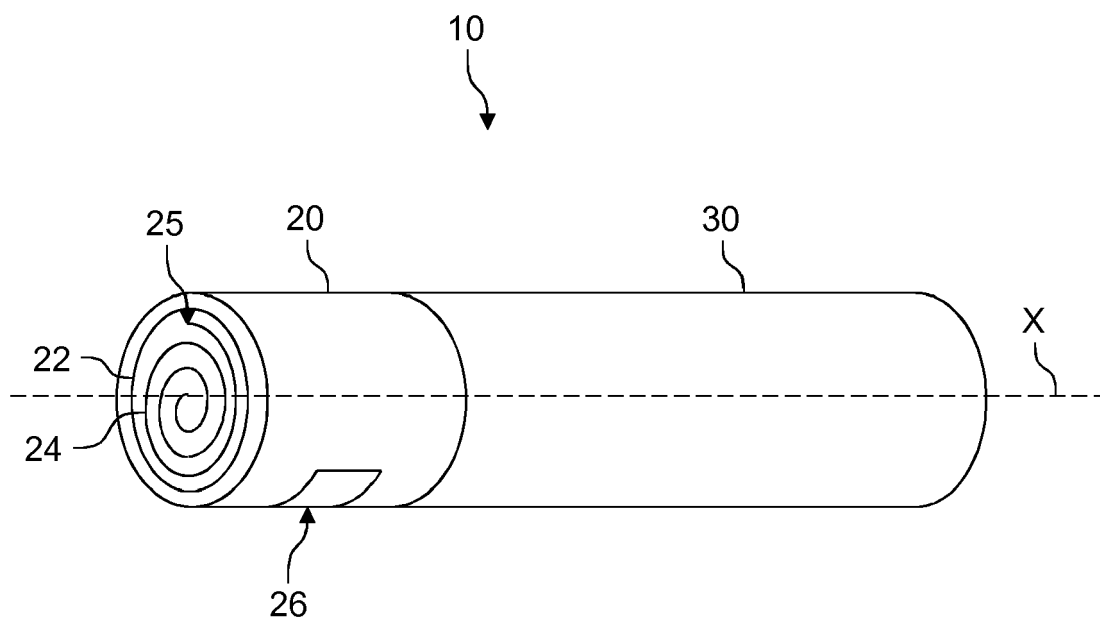


Fig. 2

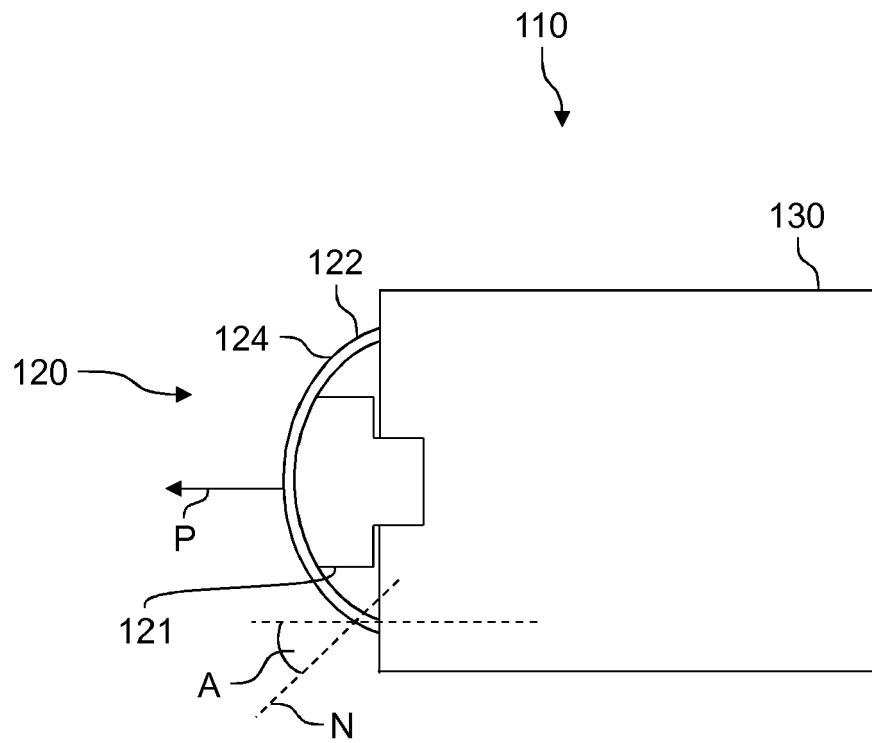


Fig. 3

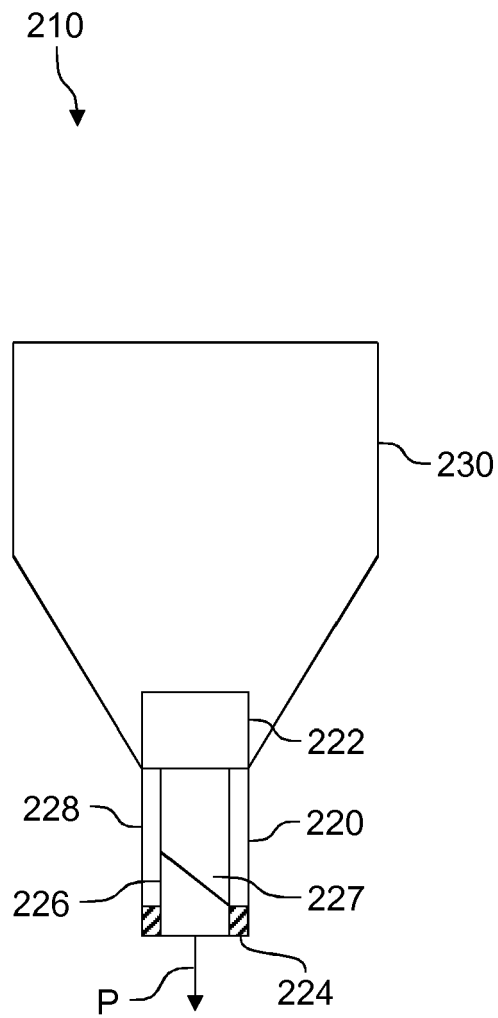


Fig. 4

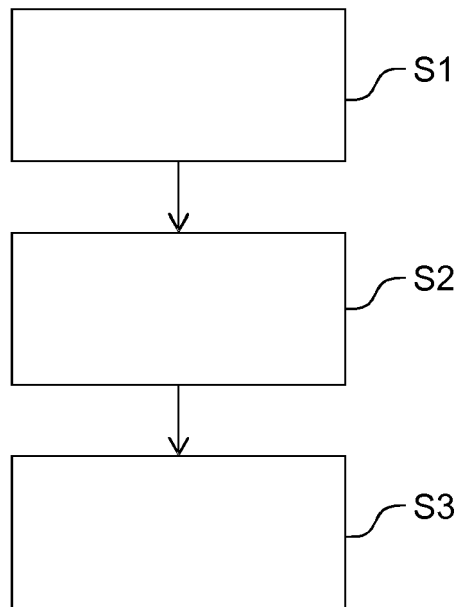


Fig. 5



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X A	WO 2017/166980 A1 (QINGDAO HAIER DRUM WASHING MACHINE CO LTD [CN]) 5 October 2017 (2017-10-05) * abstract * * paragraphs [0042], [0061] - [0078]; figures *	1-4,8-13 5-7	TECHNICAL FIELDS SEARCHED (IPC) D06F A47L B65D
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