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(54) DOOR HANDLE WITH DISINFECTION

(57) A door handle (4) with disinfection contains an upper body in the form of a disinfecting liquid container (1), a pump (5) supplying the disinfecting liquid, a disinfecting liquid transport line (6), and at least one disinfecting liquid outlet nozzle (21) onto the handle (4). The handle has a lower rotary body (3) with a handle (4). The handle (4) is installed on the handle pin with square cross-section (8) installed rotatably inside the square of the door lock. The lower rotary body (3) of the handle contains a return spring restoring the horizontal, resting position of the handle (4) and a socket (22), in which the handle (4) is installed. A disinfecting liquid inlet chamber (10) supplied with the liquid by a line (6) is located in the installation area of the handle (4) in the lower rotary body (3). The disinfection liquid inlet chamber (19) leading to the handle (4) is connected via at least one radial duct (24) supplying the disinfecting liquid to the circumferential groove (25) in the surface of the handle (4). The aforementioned surface of the socket (22) of the handle (4) contains at least one axial groove (21) supplying the disinfecting liquid from the circumferential groove (25), through axial grooves (21), to the working surface of the handle (4). The axial grooves (21) supplying the disinfecting liquid inside the socket (22) used for installation of the handle (4) are spaced evenly around the circumference of the socket (22).

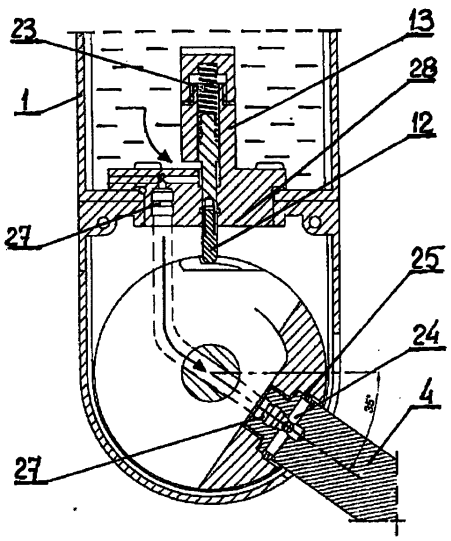

Fig. 8

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Description

[0001] The subject of the invention is a door handle with disinfection. A door handle is a type of a construction fixture. From the point of view of the user, the main functional element in a handle set is a moving handle intended to be grabbed by the hand of the user.

[0002] The handle is also mechanically coupled, via a pin, usually with a square cross-section, through a driver, with a locking element in the form of a bolt sliding out of the side of a door or a window frame and preventing the frame from being opened without pressing the handle. In the disclosed mechanism, in the closed position of the handle, a spring forces the position of the locking element, namely the bolt, slid into the frame. The handle grip pressed by the user in order to open the door is the lever activating the locking element. This causes the bolt to slide into the lock installed inside the door and the door to open. The driver should be understood as a lock element, into which the handle pin is inserted.

[0003] A known solution of the device and of the handle disinfection method are presented in the disclosure of the international patent application WO 2006/074454. According to this known solution, the device and the method of door handle disinfection contain a dosing unit for a bactericide agent, such as a disinfecting agent, an anti-bacterial solution or a cleaning agent onto the door handle at controlled intervals. The device described herein also includes a source of a liquid or a gaseous disinfecting agent, a spraying nozzle configured for transferring the liquid or gaseous disinfecting agent from the source to the nozzle and for dosing the liquid or gaseous disinfecting agent onto the handle. The device also includes a controller for drawing the liquid or the gaseous disinfecting agent. The disinfecting agent is transferred here onto the door handle at intervals, wherein the intervals are adjusted according to ambient conditions. The controller is independent of any form of manual activation in this case. According to this known solution, a system for disinfection of the door handle using a disinfecting agent in an aerosol can with a valve and a fixture for installation of the aerosol can valve is delivered. The front wall of the device also contains a sensor activating the spraying actuator. The sensor may be optical, infrared, mechanical, electric or may be a combination of these sensor types. The actuator activates spraying when a person or motion is detected by the sensor near the handle or if an interruption or vibration of a light beam is detected. The dosing unit of the spraying device may be for example controlled in order to regularly dose the bactericidal agent, at pre-set intervals.

[0004] In another solution known from the publication of the international application no. WO 2019/210113, handle disinfection implemented by placing a dosing unit with a disinfecting medium inside the handle module is provided for, where the medium is released mechanically or electrically. The use of a disinfecting liquid depends on the internal design of the handle and / or on its use, wherein the elements of such a handle are different in terms of the disinfecting medium dosing unit, such that the handle may use alternative design solutions. In a solution according to the invention, it is provided for that the disinfecting medium is dosed directly on the external surface of the door handle. According to some embodiment of the invention, the disinfecting liquid is dosed directly onto the hand of the user.

[0005] The liquid pump is connected with the liquid container here and is configured for pumping the liquid from the container to a line. In some embodiments of the invention, the line is functionally connected with the liquid pump. In other embodiments of the invention, the line may be functionally connected directly with the liquid container.

[0006] The disinfecting liquid pump is a membrane pump, operated by mechanically pressing the pump membrane in order to push out a certain volume of liquid from the liquid container, through the liquid pump and into the line. In other embodiments of the invention, other pump types may be used, including mechanical or electric pumps. In some embodiments of the invention, the liquid pump may be activated manually by the user, for example, the user may press the membrane of the liquid pump in order to operate the liquid pump.

[0007] The used liquid may be a disinfecting liquid with sterilising, disinfecting, anti-septic, anti-microbial properties and / or with other disinfecting or cleaning properties. Active ingredients present in the disinfecting liquid may include disinfecting liquids based on alcohol, such as isopropyl alcohol, ethanol, n-proponal and other alcohol-based liquids; or alcohol-free disinfecting liquids, such as, inter alia, benzalkonium chloride comprising a chemical disinfecting agent, triclosan as an anti-septic agent, thymol as an organic anti-bacterial agent and / or other non-alcoholic disinfecting liquids.

[0008] In another embodiment known from the patent disclosure EP 2428627, the device in the form of a door handle includes a unit used to move the door and a disinfecting agent dosing unit, connected with the handle of the rotary lock for simultaneous release of the disinfecting agent onto the hand of the user, through a port, when the handle is rotated. The unit includes a rotary lock handle connected with a door lock and a port located in the rotary lock handle. The handle is a part of the unit used to move the door, it enables manipulation of the door lock and is attached to the door. The handle contains a disinfecting agent dosing unit. The handle contains a hollow, C-shaped line, movably connected to a pair of handle bushings attached to the door. The dosing unit includes a pump, a line running from the disinfecting agent container, a Y-line, ducts supplying the disinfecting agent and a handle. The pump is installed on a pair of pump guides, to the handle bushing. The pump contains a pump piston, a pump spring and a ball valve, connected in order to pump the liquid between the lines. The disinfecting agent penetrates the handle material in order to come into contact with the hand manipulating the handle.

Another solution of a permeable handle includes providing a handle surface made of perforated material. A spring support, a spring and a spring plate are located inside the handle, hear the handle bushing. Together, these elements form a pressing unit holding the handle inside, such that pulling the handle applies a pressing force, causes the pump to dose the disinfecting agent and restores the handle to the initial position. This way, each time the door handle is pulled, some of the disinfecting liquid is applied from the handle onto the hand of the user.

[0009] According to the invention, the door handle with disinfection contains an upper body in the form of a disinfecting liquid container, a pump feeding said liquid, a disinfecting liquid transport line, and at least one disinfecting liquid outlet nozzle. The handle contains a pin with square cross-section, rotatably placed inside the square of the door lock, and a spring restoring the horizontal, resting position of the handle, and a socket in which the door handle is installed.

[0010] According to the invention, the door handle with disinfection is characterised in that it contains a lower rotary body with a handle. The handle contains an inlet chamber for the disinfecting liquid, connected with the supply line of the disinfecting liquid, wherein the aforementioned inlet chamber of the disinfecting liquid is connected to at least one axial duct supplying the disinfecting liquid to the interface between the socked surface and the handle surface. The aforementioned handle socket position contains at least one axial groove, parallel to the longitudinal axis of the handle, supplying the disinfecting liquid onto the working surface of the handle.

[0011] In the solution according to the invention, the end of the piston of the disinfection liquid pump is preferably supported by a cam in the lower rotary body of the handle, and the piston moves inside the pump cylinder in both directions, according to the cam profile, while the pump unit is provided with a liquid inlet into the pump chamber and a liquid outlet to the flexible line supplying the inlet chamber of the disinfection liquid leading to the handle.

[0012] The end of the piston of the disinfecting liquid pump is preferably additionally supported on the track of a ratchet placed rotatably on the rotation axis in the bottom rotary body of the handle, where the ratchet includes an arc-shaped aperture with a rotation limiting element, while the bottom arm of the ratchet is connected flexibly with the piston of the rotation limiting element of this ratchet, while the cylinder of the aforementioned limiting element is installed such that it can move into the housing of the bottom rotary body of the handle.

[0013] The ratchet is preferably installed rotatably on the axis of the bottom rotary body, in a working position set using a spring.

[0014] In a preferable embodiment of the invention, a circumferential groove supplying liquid to at least one axial groove on the inner surface of the handle socket is located on the surface of the door handle, within the area of the outlet of at least one duct supplying the disinfecting liquid.

[0015] In a preferable embodiment of the invention, the pump includes a body and a piston spring, wherein the piston moving to its lowest position supplies a dose of the disinfecting liquid into the supplying line, wherein the disinfecting liquid is supplied under gravity in the highest position of the piston, to the dosing pump unit supplying a dose of the disinfecting liquid.

[0016] The outlet of the disinfecting liquid line is preferably pressed into the supplying opening of the liquid inlet chamber leading to the handle, wherein this inlet chamber supplying opening is provided inside with circumferential rings.

[0017] The inlet to the disinfecting liquid line is preferably pressed into the axial opening in the bottom of the pump unit, wherein this opening in the bottom of the pump unit is provided inside with circumferential rings.

[0018] The previously proposed solutions are based on a door handle with disinfection in general. Each time the undisinfected handle is touched poses a real hazard of the user spreading bacteria, viruses or pathogenic microbes from the handle surface. The problem to be solved is to avoid the dosing of the disinfecting liquid onto the skin and to propose a solution, in which the liquid is applied onto the handle surface and at a precisely defined time, when the hand of the user no longer touches the door handle.

[0019] In a solution according to the invention, the surface of the door handle intended for disinfection is covered with the disinfecting liquid thanks to a solution in the form of axial grooves in the socket used to install the door handle, acting as nozzles. The grooves are located on the inner surface of the socket used to install the door handle, parallel to the handle axis.

[0020] Thanks to the use of a delaying mechanism comprising a brake with a brake spring connected with a ratchet cooperating with the dosing pump piston, liquid spraying is delayed compared to the main operation of the handle, i.e. to its motion within the range between 0° and ca. 30° intended to open and/or lock the door. Once pressed by the user, the door handle rotates from the horizontal position, within the range of ca. -30° in order to open or close the door. In the solution according to the invention, when the handle is released by the user, the handle returns automatically to the 0° position thanks to the spring action inside the door lock and a few seconds later the liquid is dosed onto the handle. The handle is disinfected in the device according to the invention after use by the user and before use by another user.

[0021] The delay in liquid application onto the handle surface is possible thanks to the fact that when the user presses the handle and sets it in motion, the piston inside the supplying pump is raised on the working surface of the cam comprising a part of the rotary body of the handle. This results in compression of the piston spring acting with its decompression force onto the piston and in an adequate amount of the liquid flowing into the pump

chamber. During piston motion, the piston of the delaying unit in the form of a limiting element moves inside the delaying unit and the braking spring in this unit becomes compressed. The locking element in the form of a bolt slides inside the lock, and the door becomes unlocked. The door is ready to be opened. The user holds the handle.

[0022] When the door is open and the handle is released by the user, during the return motion of the handle in the range between ca. -30° to the horizontal position, the piston remains ready to pump the liquid which previously entered the pump chamber inside the supplying pump, through the radial ducts inside the handle and to the axial grooves on the internal surface of the handle socket, acting as nozzles. The piston spring is compressed in this case.

[0023] The brake spring of the limiting element remains compressed inside the delaying unit.

[0024] When the user removes the hand from the door handle, the locking element in the form of the bolt slides out of the lock, thus locking the door. The handle was released by the hand of the user. The ratchet motion limiting element slows down the ratchet rotation until the end of the pump piston meets the cutout in the curve of the ratchet. This results in a sudden release of potential energy of the piston spring and its sudden motion downwards, resulting in sudden pumping of a dose of the disinfecting liquid stored inside the pump unit, through the flexible line, to the handle chamber. The liquid passes from this chamber, through the axial ducts, to the circumferential duct on the surface of the handle and further, to the carved axial grooves on the internal surface of the socket of the lower body, in which the door handle is installed. The outlets of these axial grooves, parallel to the working surface of the door handle touched during regular use of the handle, act as spraying nozzles.

[0025] Disinfection in the solution according to the invention takes place at the target location on the handle by dosing a dose of the disinfecting agent from axial grooves onto the handle surface with a delay. Thanks to the operation of the brake provided as a limiting element, the ratchet may control the motion of the piston pump, ensuring its delay. Within the specified time window, when the pump piston is released from the ratchet groove, the liquid is suddenly pumped into the inlet of the line connecting the pump with the lower rotary body.

[0026] The disinfecting module is the main functional element of the handle unit, the functionality of which is ensured in particular through the use of the supplying line with a ratchet mechanism and a ratchet motion brake. The handle is disinfected after the phase of return motion of the handle to the resting position. The handle motion downwards intended to open the door is executed through the muscle force of the user, by pressing the handle and guiding it down, until the tilt angle is ca. -35°. The handle returns to the initial position at 0° automatically, the handle returns to the starting point relatively quickly thanks to the spring mechanisms. The brake in the form of a limiting element delays the disinfection process in relation to the handle release, providing a time window between handle release by the hand of the user and the release of the pump piston from the ratchet groove, thanks to the action of the limiting element. This takes place with a delay of several seconds, implemented by the ratchet cooperating with the limiting element, as disclosed above.

[0027] The task of the invention was implemented and it consisted of direct application of the disinfecting liquid onto the handle surface instead of the hand of the user. The handle is generally located near the door lock, with the option of using the handle with locks other than door locks, for example also as a window handle. The disinfected handle can be used for opening and closing, after each disinfection. The handle may be used, for example, as a handle indoors and outdoors, for example, with entry gates, roofed spaces or with doors or windows of utility buildings.

[0028] The object of the invention has been presented in embodiments in the attached drawing, in which individual figures of the drawing represent as follows:

Fig. 1 - a view of the door handle unit.
Fig. 2 - an expanded view of the unit according to Fig. 1.
Fig. 3 - rotary lower body of the handle viewed towards the handle installation opening.
Fig. 4 - body according to Fig. 3 in a perspective view.
Fig. 5 - body according to Fig. 3 viewed towards the axis of symmetry of the square used to install the handle inside the lock.
Fig. 6 - a view of the interior of the lower handle body.
Fig. 7 - a cross-section through the lower handle body with the plane coinciding with the axis of symmetry of the pump piston.
Fig. 8 - a schematic cross-section of the bottom of the container and of the lower pump body with the plane coinciding with the axis of symmetry of the pump piston with the disinfection liquid line presented for the door handle being pressed.
Fig. 9 - a cross-section according to Fig. 8 with the ratchet and the cam guiding the pump piston presented at the resting position of the door handle.
Fig. 10 - a cross-section according to Fig. 9 with the door handle being pressed.
Fig. 11 - a cross-section through the handle in the lower body socket in the area of radial ducts and of the circumferential groove.

[0029] Fig. 1 shows the handle unit viewed towards the surface of the door in which it is installed. An identical handle unit is installed on the other side of the door. The handle unit includes a top container 1 of the disinfecting liquid, a cover 2, a lower rotary body 3 and a handle 4.

In this embodiment, the handle 4 has round cross-section. This does not exclude the use of any other shape of the cross-section of the handle 4 in other embodiments. The entire handle unit is installed in the door in a known way, such that the handle 4 cooperates with the door lock through a known square pin.

[0030] The handle unit is shown in Fig. 2 in an expanded view. The top container 1 of the disinfecting liquid contains a lid 2 on top, which allows liquid topping up and contains a known lock unit securing the lid 2 against unauthorised opening and topping up of the disinfecting liquid. An opening cooperating with the lock bolt of the top lid 2 is visible in the top part of the container 1. In other embodiments, the lock of the lid 2 may be provided as a different solution. In this disclosure, the used term liquid means a disinfecting liquid.

[0031] In the bottom part of Fig. 2, the lower rotary body 3 is shown. It shows, respectively, the handle 4, the lower rotary body 3, the pump liquid 5, the liquid line 6, the ratchet 7, the limiting element 14 of the return motion of the ratchet and the square pin 8, opening and closing a known bolt (not shown in the figures) of the door lock operated using the door handle.

[0032] Fig. 3, Fig. 4 and Fig. 5 present various views of the lower rotary body 3 of the handle unit. Fig. 3 shows the body 3 viewed towards the handle installation opening. These figures show bushing 9, perpendicular to the handle (not shown in this case). Fig. 4 and Fig. 5 show the opening 10 for installation of a known square pin cooperating with the known door lock.

[0033] These Fig. 4 and Fig. 5 show a cam 11 cooperating with a piston 12 of the liquid pump 5. This cooperation is shown in more detail in Fig. 9 and Fig. 10 and shall be discussed further in the text. Fig. 4 and Fig. 5 show the cam 11 guiding the piston 12 of the liquid pump 5. The end of the piston 12 rests on the cam 11. During pressing of the handle 4 and clockwise rotation of the lower rotary body 3, this rotation causes the piston 12 of the pump 5 to slide on the cam 11 and to raise upwards, collecting a dose of the liquid from the top container 1 to the pump unit 5. In this embodiment, the lower rotary body 3 is a metal cast, machined into the final form. In other embodiments, the lower body 3 may be made using different technologies and materials.

[0034] Fig. 6 shows the lower rotary body removed from the housing of this body. It shows the ratchet 7, covering the cam 11 in this view. The ratchet 7 is an element independent from the cam 11 and contains a groove, on which the end of the piston 12 cooperating with the cylinder 13 of the pump 5 slides, as is shown in Fig. 9 and Fig. 10. The end of the piston 12 simultaneously cooperates with the groove of the cam 11 and with the groove of the ratchet 7. This is shown schematically in Fig. 9.

[0035] Fig. 8 shows schematically the route of the flexible liquid line leading to the lower rotary body 3. In the opening in the bottom 28, the line 6 is pressed into the opening, where circumferential rings 27 are located. Similar rings 27 are present in the opening in the handle 4. The flexible line 6 expands in these openings under liquid pressure, while the circumferential rings 27 seal the connections and prevent the line 6 from moving out of the openings.

[0036] Fig. 9 shows that the bottom arm 16 of the ratchet 7 is rotatably connected with the piston 17 of the limiting element 14 of the ratchet 7. The limiting element 14 is a known solution containing liquid and delaying motion of the piston 17, but only in one direction. Thus, the limiting element 14 slows down the return motion of the ratchet 7 to the resting position when the handle 4 is released by the user. The limiting element 15 of the rotation range of the ratchet 7 is also shown here. Upon release of pressure of the user hand applied to the handle 4, action of the limiting element 14 causes the lower rotary body 3 to return to the horizontal position, and thus the handle 4 returns to the horizontal position when the handle 4 is released by the user with regular speed.

[0037] However, action of the limiting element 14 of the ratchet return motion causes the ratchet 7 to return to the resting position with a delay. As a result of this, the piston 12 of the pump 5 falls under the action of its own spring 23, also with a delay, and thus after the hand of the user releases the handle. After the release by the ratchet 7, during falling, piston 12 of the pump 5 supplies a dose of the liquid to line 6 and to the chamber 19 of the handle 4 with a delay. The motion of the pump piston 12 is sudden in this case, as the selection 20 on the ratchet 7 edge releasing the piston 12 has side edges perpendicular to the axis of rotation of the ratchet 7. Thus, the piston 12 of the pump 13 suddenly falls under the action of its own spring 23, shown in Fig. 7 to Fig. 10, generating a liquid dose pulse via the line 6 to the chamber 19 of the handle 4 in the disclosed system supplying this chamber 19 in the handle 4, shown in Fig. 8. As described above, this happens with a delay compared to the return of the handle 4 to the horizontal resting position.

[0038] The handle 4 released by the hand of the user returned to the horizontal resting position, and next, as a result of cooperation between the ratchet 7, and in particular, of its bottom arm 16, with the limiting element 14, a dose of liquid was suddenly pumped from the pump unit 5 to the chamber 19 with a delay, also described as time delay here. The liquid left the chamber 19 and reached the circumferential groove 25 through radial ducts 24, from where it was pumped out as a pulse, through axial grooves 21 on the inner surface of the socket 22. The grooves 21 are shown in Fig. 8, as well as in Fig. 11.

[0039] Fig. 11 shows a cross-section through the handle 4 placed in the socket 22 of the lower rotary body 3. The cross-section was made in the area of the chamber 19, the radial ducts 24 and the circumferential groove 25, in the junction area between the surface of the handle 4 and the socket 22 of the lower body 3.

[0040] Four axial grooves 21 running in the direction of the longitudinal axis of symmetry of the handle 4 have

been provided on the inner surface of the socket 22 of the body 3. Grooves 21 have an equilateral triangle cross-section, the height of which is 0.2 mm in this case Fig. 11 shows these grooves 21 magnified to ensure clarity of the figure. The sudden release of liquid from the grooves 21 with the indicated dimensions results in the liquid being sprayed on the handle 4 at four points along the circumference of the handle 4, on top, at the bottom and on both sides. The spraying takes place in the longitudinal direction, in parallel and at the contact point with the surface of the handle 4. The open, axial grooves in the socket 22 are closed by the surface of the handle 4.

[0041] As was already said, the cooperation between the ratchet 7 and the limiting element 14 delays ejection of liquid from the grooves 21 along the surface of the handle 4, compared to the time at which the handle 4 was released by the hand of the user, regardless of how long the user held the handle 4 pressed. Thus, in this solution disinfection takes place only when the door handle is released. The next user of the door touches the handle disinfected with the liquid. Pressing the door handle 4 causes rotation of the lower body 3, the piston 12 of the pump 5 is raised on the cam 11 and the pump unit 5 is filled with a new dose of the disinfecting liquid. When the handle is released again, the disclosed disinfection process repeats.

[0042] In this embodiment, four grooves 21 are located on the inner surface of the socket 22 of the handle 4, running parallel to the axis of symmetry of the handle 4, separated by 90° around the circumference of the socket 22. This is shown in Fig. 11. The liquid is pumped into the chamber 19 of the handle 4 and is sprayed through four ducts 24 into grooves 21 and from these grooves 21 onto the surface of the cylindrical handle 4, on four sides, under the pressure of the piston 12. Other embodiments may include a different number of grooves 21 on the surface of the socket 22, with different shapes and directions. All these grooves shall be supplied with liquid from the circumferential groove 25 on the surface of the handle.

[0043] The cross-section of the outlet of each groove 21 has the shape of an equilateral triangle in this embodiment, with the base aimed towards the surface of the handle 4, with a height of 0.2 mm. At this sizes of the cross-section and of the outlet from the groove 21, the liquid released under pressure is sprayed and lands on the surface of the handle 4, already released by the user. In other embodiments, the grooves 21 may have different shapes and sizes and may be separated differently around the circumference of the socket 22 of the lower rotary body 3 of the handle 4.

List of references used in the figures.

[0044]

1. Top liquid container.
2. Lid.
3. Lower rotary body.
4. Handle.
5. Liquid pump.
6. Liquid line.
7. Ratchet.
8. Square pin.
9. Square pin bushing.
10. Opening.
11. Cam.
12. Piston.
13. Liquid pump cylinder.
14. Ratchet return limiting element.
15. Ratchet rotation limiting element.
16. Bottom arm of the ratchet.
17. Limiting element piston.
18. Limiting element cylinder.
19. Handle chamber.
20. Selection at cam edge.
21. Axial groove on the surface of the handle socket.
22. Handle socket.
23. Liquid pump piston spring.
24. Radial liquid duct.
25. Circumferential groove
26. Ratchet spring.
27. Circumferential rings.
28. Pump unit bottom.

Claims

1. Door handle with disinfection, containing a top body in the form of a disinfecting liquid container, a pump supplying the disinfecting liquid, a line supplying the disinfecting liquid and at least one liquid outlet nozzle providing the liquid onto the handle, a square cross-section pin rotatably installed inside the door lock square, a spring returning the handle to the horizontal resting position, wherein the handle is installed in the socket, **characterised in that** the handle has a lower rotary body (3), wherein in the installation area of the handle (4) in the lower body socket (3), the door handle (4) contains an inlet chamber (19) of the disinfecting liquid, to which the disinfecting liquid supply line (6) is connected, wherein the disinfecting liquid inlet chamber (19) is connected with at least one radial duct (24) supplying the disinfecting liquid to the junction between the surface of the socket (22) and the surface of the handle (4), while the aforementioned surface of the socket (22) of the handle (4) contains at least one axial groove (21) supplying the disinfecting liquid onto the working surface of the handle (4), parallel to the longitudinal axis of the handle (4).

2. A door handle according to claim 1, **characterised in that** the end of the piston (12) of the disinfecting liquid pump (5) rests on the cam (11) in the lower rotary body (3) of the handle (4) and the piston (12)

moves inside the cylinder (13) of the pump (5) in both directions according to the profile of the cam (11), while the liquid pump unit contains a liquid inlet leading to the chamber of the pump (5) and a liquid outlet to the flexible line (6) supplying the chamber (19) of the disinfecting liquid inlet to the handle (4).

3. A door handle according to claim 1 or 2, **characterised in that** the end of the piston (12) of the disinfecting liquid pump (5) additionally rests on the groove of the ratchet (7) placed rotatably on the axis of rotation in the lower rotary body (3) of the handle (4), where the ratchet (7) contains an arch-shaped aperture with a rotation limiting element (15), while the lower arm (16) of the ratchet (7) is flexibly connected with the piston of the rotation limiting element (17) of this ratchet (7), wherein the cylinder (18) of the limiting element (14) is installed such that it can tilt inside the housing of the lower rotary body (3) of the handle (4).

4. A door handle according to claim 3, **characterised in that** the ratchet (7) is installed rotatably on the axis of the lower rotary body (3) in a working position set using a spring (26).

5. A door handle according to claim 1, **characterised in that** a circumferential groove (25) supplying liquid to at least one axial groove (21) on the inner surface of the socket (22) of the handle (4) is located on the surface of the handle (4), within the area of the outlet of at least one radial duct (24) supplying the disinfecting liquid.

6. A door handle according to claim 1 or 2 or 3, **characterised in that** the liquid pump (5) contains a body and a spring (23) of the piston (12), whereby the piston (12) passing to the lowest position supplies a dose of the disinfecting liquid into the guiding line (6).

7. A door handle according to claim 1, **characterised in that** the outlet of the disinfecting liquid line (6) is pressed into the supplying opening of the liquid inlet chamber (19) leading to the handle (4), wherein this opening supplying the inlet chamber (19) is provided inside with circumferential rings (27).

8. A door handle according to claim 1 or 7, **characterised in that** the inlet to the disinfecting liquid line (6) is pressed into the opening in the bottom (28) of the pump unit (5), wherein this opening in the bottom (28) of the pump unit (5) is provided inside with circumferential rings.(27).

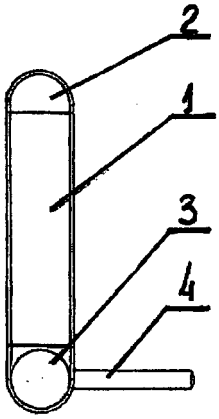


Fig. 1

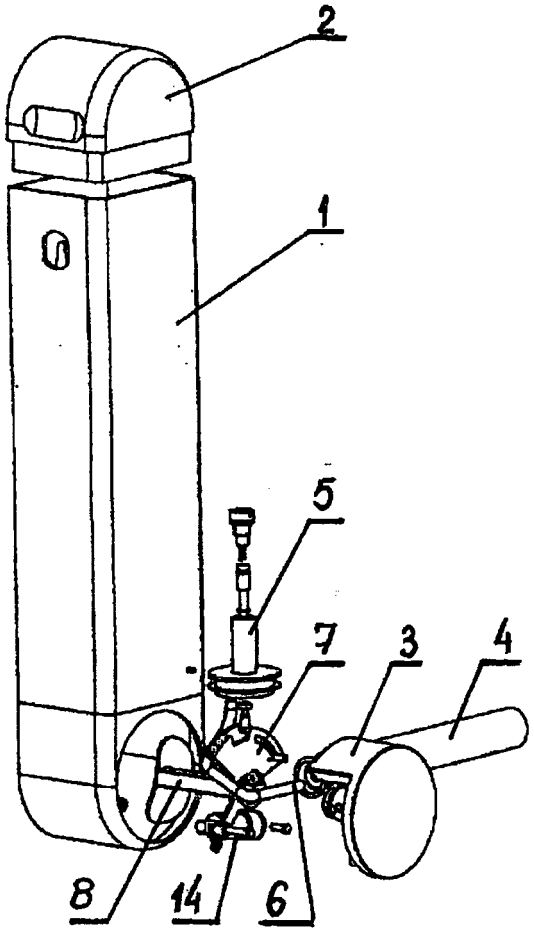
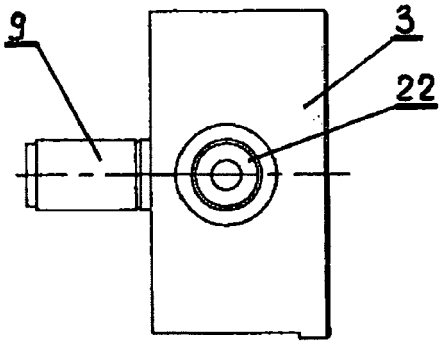


Fig. 2



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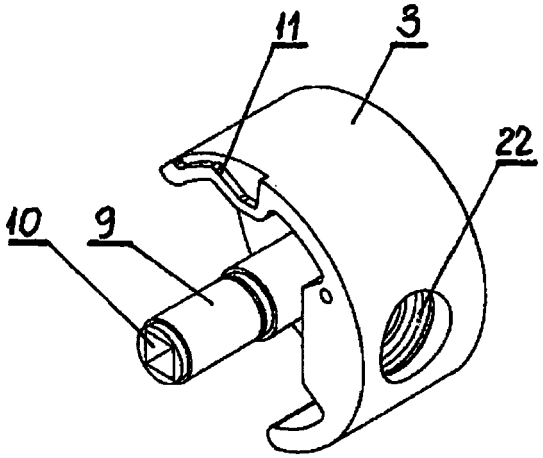

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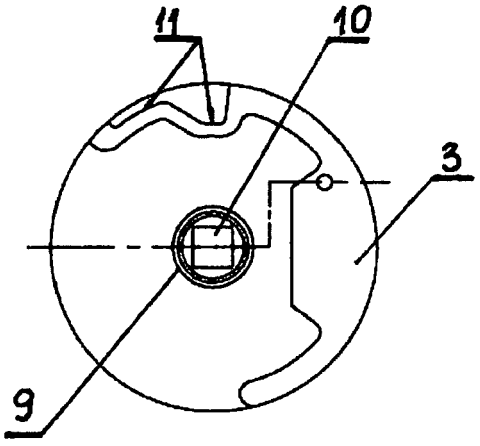

Fig. 5

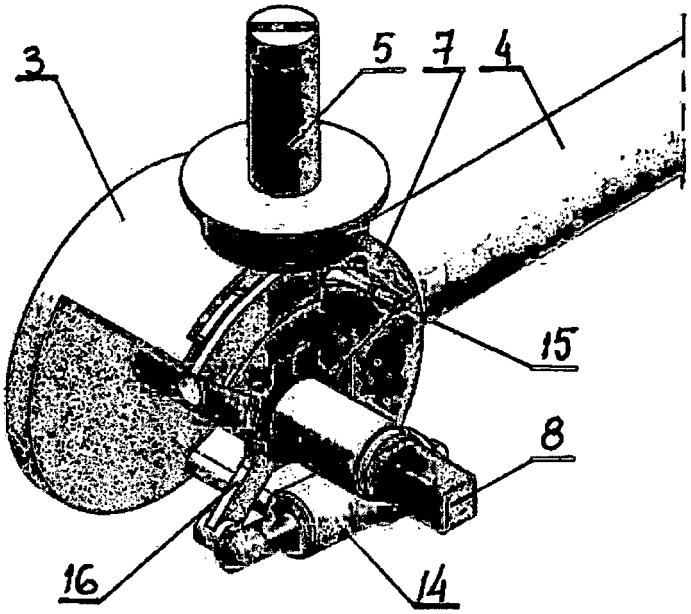

Fig. 6

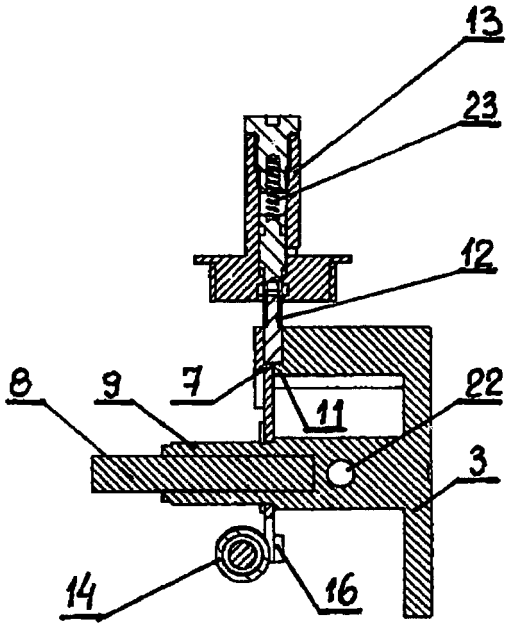

Fig. 7

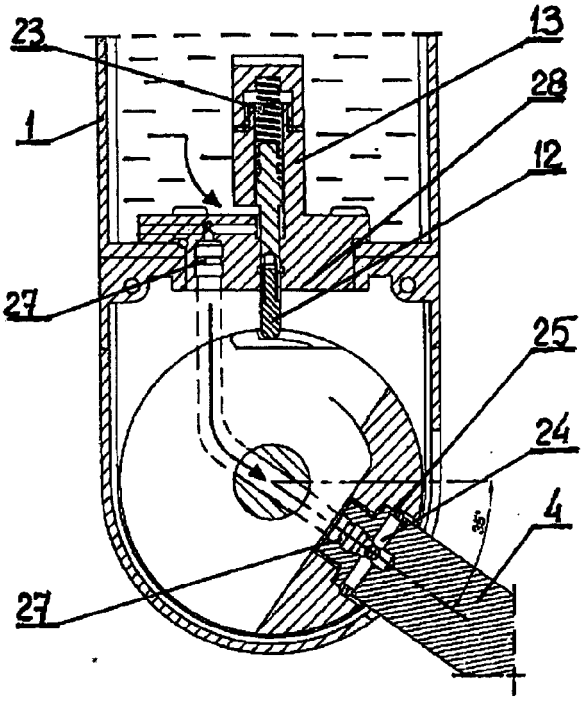

Fig. 8

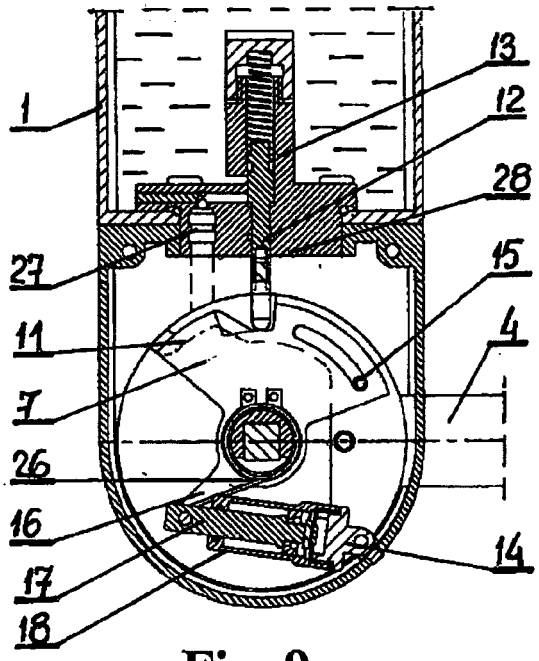

Fig. 9

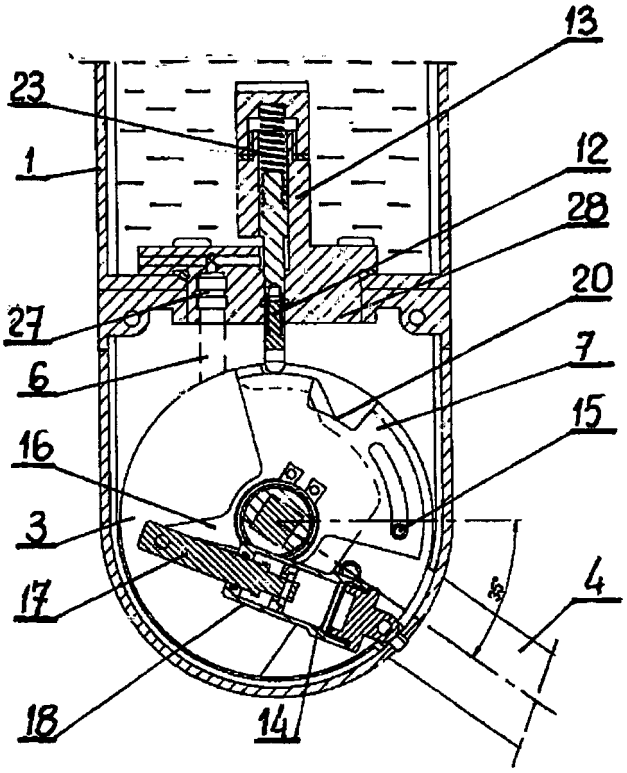

Fig. 10

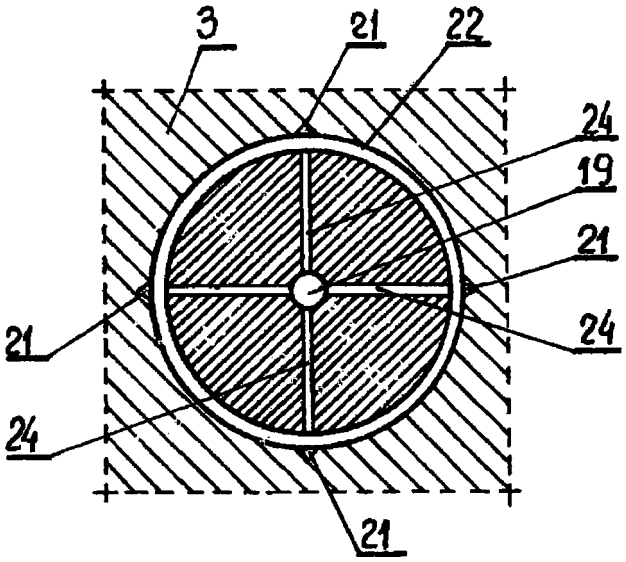

Fig. 11

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EUROPEAN SEARCH REPORT

Application Number
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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	17 January 2022	Koster, Michael

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