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- (71) Applicant: ECOLAB INC. [US/US]; 370 Wabasha Street N, St. Paul, Minnesota 55102-1390 (US).
- (72) Inventors; and
- (71) Applicants (for US only): ZETTLITZER, Günter [DE/DE]; Rambergerweg 11B, 83346 Bergen (DE). KOCH, Hans [DE/DE]; Adlgasserstr. 105, 83334 Inzell (DE).
- (74) Agent: MICHALSKI HÜTTERMANN & PARTNER PATENTANWÄLTE MBB; Speditionstr. 21, 40221 Düsseldorf (DE).

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(54) Title: VALVE FOR A DISPENSER

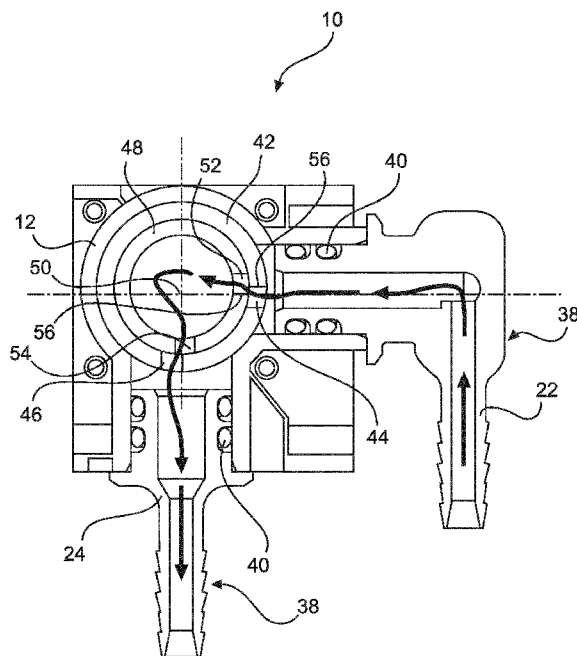


Fig. 2

(57) Abstract: A safety valve (10), in particular for a dispenser (16) for dispensing a substance (18) in form of a fluid, comprises a valve housing (12) with at least one inlet (22) and at least one outlet (24) fluid permeable connected to an internally arranged inlet opening (44) and an internally arranged outlet opening (46), a rotary slide (48) with at least a first valve port (52), wherein the rotary slide (48) is rotatable around a first axis (50) into an opened and/or closed position, and at least one rotary element (30) connected to the rotary slide (48) for actuating the safety valve (10) by rotating the rotary element (30) into the opened and/or closed position, wherein in the opened position, the first valve port (52) and the rotary slide (48) cooperates with the inlet opening (44) and/or the outlet opening (46) in order to enable the flow of a fluid from the inlet (22) to the outlet (24), while blocking the flow of the fluid in the closed position, wherein the rotary element (30) is a functional part (32) of the dispenser (16). Designing the rotary element (30) as a functional part of the dispenser (16), which must be handled by a person working on the dispenser (16), for example refilling the substance, the safety valve (10) is activated and the person is protected from being sprayed or contaminated by the substance (18).

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VALVE FOR A DISPENSER

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Technical field of the invention

The present invention relates to a safety valve in
10 particular for a dispenser for dispensing a substance in
form of a fluid.

Background of the invention

15 Substances used for cleaning, in particular in industrial
washing systems, are often solid substances which usually
need to be dissolved and/or diluted by a fluid, for
example by water, in a dispenser. Dispensers for
dispensing such substance are usually part of a dosing
20 system, for example of a flushing or spraying dosing
system, which are widely used in industrial, medical or
household applications.

The substance that is to be dosed by the dosing system is
25 usually held within the dispenser and may be a fluid, a
paste or a solid but soluble substance, which may be
dissolved by spraying or flushing the solid substance,
for example with water. The substance which may be
dissolved by spraying or flushing is provided to the
30 dosing system in form of a fluid which may then be dosed
as desired. The dispenser may be connected to the water
mains and the water for spraying or flushing the

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substance may be pressurized, for example with a pressure of about 6 bar. Therefore, it is necessary to provide safety measures for protecting a person performing a refill, repair or service work on the dispenser of the
5 flushing or spraying dosing system.

Thus, there is a permanent need to increase the safety for a person working on the dispenser of a dispensing system.

10

It is therefore an object of the present invention to provide an improved safety valve for a dispenser, which enhances the safety for a person working on the dispenser of the dispensing system, by providing a reliable
15 interruption of the water supply of the dispenser.

SUMMARY OF THE INVENTION

This object is solved by means of a safety valve for a
20 dispenser for dispensing a substance as a fluid, having the features of claim 1. Preferred embodiments, additional details, features, characteristics and advantages of the object of the invention of said safety valve are disclosed in the sub-claims.

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In a general aspect of the invention, the safety valve, in particular for a dispenser for dispensing a substance
30 in form of a fluid, comprises a valve housing with at least one inlet and at least one outlet fluid permeable connected to an internally arranged inlet opening and an

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internally arranged outlet opening, a rotary slide with at least a first valve port, wherein the rotary slide is rotatable around a first axis into an opened and/or a closed position, and at least one rotary element
5 connected to the rotary slide for actuating the safety valve by rotating the rotary element into the opened and/or closed position, wherein the opened position, the first valve port of the rotary slide cooperates with the inlet opening and/or the outlet opening in order to
10 enable the flow of a fluid from the inlet to the outlet, while blocking the flow of the fluid in the closed position, wherein the rotary element is a functional part of the dispenser.

15 The safety valve may be used with a dispenser of a dosing system, in particular of a flushing or spraying dosing system, wherein the substance that is to be dosed in form of a fluid may be held in the dispenser and may be dissolved in the dispenser, for example by flushing or
20 spraying the substance with water, in particular with hot and/or pressurized water. The substance may be a fluid, a paste or a water soluble solid. The dispenser may be connected to the water mains, wherein the safety valve is provided in order to enable the shut-off of the water
25 supply and for stopping the flushing or spraying of the substance, when a person is working on the dispenser, for example refilling the substance. The safety valve may comprise a valve housing, with at least one inlet and at least one outlet, wherein the inlet may for example be
30 fluid permeable connected to the water mains and the outlet may be connected to a flushing or spraying element of the dispenser for spraying or flushing the substance.

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The valve housing may be formed as part of or may be formed integrally with a dispenser housing. The inlet may be connected fluid-permeable to an inlet opening which is arranged internally inside the valve housing, wherein the outlet may be connected to an internally arranged outlet opening. In between the inlet opening and the outlet opening, a rotary slide with at least a first valve port may be arranged, wherein the rotary slide is rotatable around a first axis into an opened and/or closed position. In the opened position, a fluid, for example water, may pass through the inlet to the inlet opening and may reach the outlet opening by passing the first valve port of the rotary slide and may flow through the internally arranged outlet opening in order to exit through the outlet. In the closed position, the rotary slide may be rotated around the first axis in either direction, so that the valve port is rotated away from the inlet opening or the outlet opening, so that the inlet opening or the outlet opening is blocked by the rotary slide so that no fluid, in particular water, may flow from the inlet to the outlet. Thus, the flow of water is interrupted and the spraying or flushing of the substance is stopped. The rotary slide may be arranged at least partially inside the valve housing. A rotary element, which may be arranged outside the valve housing, may be connected to the rotary slide for actuating the safety valve by rotating the rotary element into the opened and/or closed position. The rotary element connected to the rotary slide may be a functional part of the dispenser. A functional part of the dispenser may be a part that must be handled, for example by rotational and/or translational movement, by a person working on the

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dispenser, for example when repairing or refilling the substance inside the dispenser. The functional part of the dispenser may be rotatable around the first axis and/or may be connected to the rotary slide by a
5 transmission.

The safety valve according to the present invention has a few advantages over devices according to the state-of-the-art. For example, by designing the rotary element as
10 a functional part of the dispenser, which must be handled by a person working on the dispenser, for example refilling the substance, the shutoff valve is forcefully activated and the person is protected from being sprayed or contaminated by the substance or hot water. Even if
15 the operator forgets to shut-off or disconnect the water mains, a safe operating or handling of the dispenser is ensured. Furthermore, an accidental activation of the dispenser and thus a contaminating of the operator with the substance or water is avoided as the safety valve is
20 only opened once the functional part of the dispenser has been returned into its original position, for example the closed position. Another advantage of the improved safety valve is the simple construction and the simple activating mechanism so that equipment costs and
25 mechanical expenses for the dispenser may be reduced.

A2

In another embodiment of the invention, the at least first valve port and the inlet or outlet opening are
30 designed in form of cooperating control slits comprising an opening angle α , in particular wherein $\alpha \leq 10^\circ$, preferably $\alpha \leq 6^\circ$, most preferably $\alpha \leq 4^\circ$. The

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cooperating control slits may comprise cooperating control edges for controlling the flow of the fluid, in particular the water, through the first valve port and the inlet or outlet opening. The cooperating control

5 edges may be arranged on opposing sides of the control slits facing each other, wherein one control edge is arranged on the at least first valve port and the cooperating control edge on the inlet or outlet opening. By rotating the rotary slide, for example from the opened

10 into the closed position, the distance between the control edges may be reduced, until they overlap, at which moment the flow of water is interrupted and the spraying or flushing of the substance is stopped. The opening angle α is the angle that the rotary slide needs

15 to be rotated around the first axis from an opened position to the closed position wherein in the closed position, the safety valve is closed and no fluid may pass the first valve port and the inlet or outlet opening. The control slits may be designed in form of

20 narrow slits extending along at least part of the first axis. The width of the control slits in a direction around the first axis may influence the opening angle α , wherein narrow slits with a very small width around the first rotary axis may provide for a very small opening

25 angle α . The opening slits may be arranged and designed so that the opening angle α is smaller than 10° , preferably smaller than 6° and most preferably smaller than 4° . By designing the first valve port and the inlet or outlet opening in form of control slits, the

30 hysteresis of the safety valve may be kept very small, for example 10° , 6° or 4° . Hence, the hysteresis of a

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safety valve comprising an opening angle α according to the invention is much smaller than the hysteresis of a common ball valve, which may have a hysteresis and an opening angle of about 80°. This has the advantage that the safety valve is activated as soon as the functional part of the dispenser is rotated, for example by 10°, 6° or 4° around the first axis. Therefore, a spraying or flushing of the substance is deactivated by the shutoff valve as soon as the functional part of the dispenser is rotated by the opening before any substance or water may exit the dispenser, so that the operator is protected from being sprayed or contaminated by the chemical or the hot water. The small hysteresis of the safety valve has also the advantage that a spraying or flushing of the substance may only start after the functional part of the dispenser has been completely, for example less than 4°, closed.

A3

In another preferred embodiment of the invention, the functional part of the dispenser is an access cover of the dispenser for accessibly covering an opening in the dispenser housing or a container for holding the substance. The substance may be held inside a container, for example inside the dispenser housing, and may be covered by an access cover. The access cover may be designed in form of a dispenser lid covering an opening of the container holding the substance. The access cover or dispenser lid may be connected to the rotary slide so that when an operator lifts the access cover or dispenser lid, for example by rotating it around the first axis, the safety valve is automatically activated after

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rotating the access cover or dispenser lid around the opening angle α . A restart of the flushing or spraying operation of the dispenser is only possible after the access cover or dispenser lid has been fully closed

5 before the safety valve opens and allows the fluid to pass through the safety valve. Also, the container holding the substance may be rotatable arranged inside the dispenser housing, so that a person refilling the substance needs to rotate the container, for example

10 sideways, out of the dispenser housing in order to refill the substance. The container for holding the substance may be the functional part of the dispenser and may be connected to the rotary slide, so that by rotating the container into a position for refilling the substance,

15 the safety valve may be activated once the container is rotated around the opening angle α . The container and/or the dispenser housing may be designed in a way that the opening of the container for refilling the substance may only be accessible after the container has been rotated

20 around the opening angle α . This has the advantage that the safety valve stops the flushing or spraying operation before opening for refilling the substance of the container is accessible by the operator thus avoiding the operator being harmed by the substance or hot water.

25

A4

In a particular preferred embodiment of the invention, the access cover comprises a framed flap, in particular wherein the frame of the flap comprises a variable height

30 along its circumference. The height of the frame may relate to the opening angle and may be designed in a way so that no fluid may exit the dispenser until the shutoff

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valve is activated. The frame of the flap may be designed in a way that the frame overlaps the container holding the substance at least until the access cover is rotated to the opening angle α . This has the advantage that the opening covered by the access cover is closed for as long as the water and/or the dissolved substance is flowing and at least until the opening angle α is reached so that a person operating the access cover is protected from being sprayed by the substance or hot water.

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A5

In a further preferred embodiment, the valve housing comprises a valve liner for holding the rotary slide, wherein the valve liner comprises the inlet opening and/or the outlet opening. The valve liner may be designed according to the shape of the rotary slide, for example in form of a cylindrical or a plane valve liner. The inlet opening and/or the outlet opening may be designed in form of opening slits, for example of an essentially rectangular shape, and may be arranged parallel and/or angled to the first axis. The valve liner and the rotary slide held by the valve liner may be of high tolerances in order to avoid any leakage of a fluid, in particular of water of the pressurized water mains, especially in a closed position of the safety valve. The valve liner may be arranged inside the valve housing and may be designed in one piece or as an extra part being inserted into the valve housing. As the valve liner and the rotary slide need high tolerances in order to provide only a small leakage or to avoid the leakage of a fluid, production costs may be reduced by designing the valve liner as an external part.

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A6

In a further preferred embodiment, the valve liner is at least partially arranged inside the valve housing and is
5 connected to the outside of the valve housing. The valve liner may be connected to the valve housing, in particular to the outside of the valve housing, by a support plate, in order to provide a non-rotatably attachment of the valve liner to the valve housing. This
10 provides an efficient way for assembling the valve liner and the safety valve.

A7

In a further preferred embodiment of the invention, the
15 rotary slide is designed in form of an at least partial hollow cylinder, wherein at least the first valve port is arranged in a lateral area and/or a frontal area of the rotary slide. The design of the rotary slide in form of an at least partial hollow cylinder has the advantage
20 that the fluid may pass through the rotary slide from the inlet opening to the outlet opening while allowing a second valve port which may correspond to the outlet port may be integrated into the rotary slide, thus further increasing the safety and reliability of the safety
25 valve. The first and/or second valve port may be designed in form of slits, which may be arranged in parallel or at an angle, for example partially helically shaped, around the first axis.

30 A8

In a preferred embodiment of the invention, the rotary slide comprises a flat area, wherein at least the first

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valve port is arranged in the flat area of the rotary slide. The rotary slide may be designed in form of a flat-shaped element, rotatable around the first axis, and comprising at least the first valve port, for example in
5 form of a slit. The first valve port may be designed in form of a slit arranged parallel and/or at an angle to the first axis, or in particular at least partially helically shaped, curved or radially arranged. Designing the rotary slide in form of a flat-shaped element has
10 the advantage that the size of the safety valve may be further reduced while increasing the safety of an operator of the dispenser comprising the safety valve.

A9

15 In a further preferred embodiment of the invention, the rotary slide and the rotary element are connected by a flange, a plug connection and/or a positive locking connection. This has the advantage that the rotary element may be connected torque-proof to the rotary
20 slide, avoiding any relative movement between the rotary element and the rotary slide which would reduce the safety by increasing the opening angle α .

A10

25 In a further preferred embodiment of the invention, the inlet and/or the outlet is designed in form of a connector removably connected to the valve housing. The removable connector may be a standard part which allows for reducing the production costs and also increases the
30 ability to adapt the safety valve to different types of dispensers.

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A11

A further aspect of the present invention is a dispenser
in particular for dispensing a solid but soluble
substance, for a flushing and/or spraying dosing system,
5 comprising at least one safety valve as previously
described.

A12

A further aspect of the present invention is the system,
10 in particular a flushing and/or spraying dosing system,
comprising at least one dispenser as described above with
at least one safety valve as previously described.

The aforementioned components, as well as the claimed
15 components and the components to be used in accordance
with the invention in the described embodiments, are not
subject to any special exceptions with respect to their
size, shape, material selection and technical concept
such that the selection criteria known in the pursuant
20 field can be applied without a limitation.

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DESCRIPTION OF THE FIGURES

Additional details, features, characteristics and advantages of the object of the invention are disclosed in the sub-claims, the figures and the following description of the respective figures and examples, which - in exemplary fashion - show an embodiment and an example of a safety valve according to the invention.

10 In the drawings:

Fig. 1 shows a perspective view of a dispenser comprising a safety valve according to the present invention;

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Fig. 2 shows a cross-sectional drawing of a safety valve in an opened position;

Fig. 3 shows a cross-sectional drawing of a safety valve with an opening angle α ;

20

Fig. 4 shows a safety valve in a closed position;

Fig. 5 shows the safety valve of Fig. 4 in a closed position with an opening angle α of about 90° ;

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Fig. 6A shows a perspective view of an access cover in form of a framed lid;

30 Fig. 6B shows a perspective view of an access cover with a frame of variable height;

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Fig. 7 shows an access cover attached to the rotary slide; and

Fig. 8 shows a perspective view of the safety valve in
5 a disassembled display.

The illustration in Fig. 1 shows an embodiment of the present invention. In Fig. 1, a safety valve 10 is shown with a valve housing 12 arranged inside a dispenser housing 14 of a dispenser 16 of a dosing system, in particular of a flushing or spraying dosing system. The substance 18 that is to be dosed by the dispenser 16 is held in a container 20 of the dispenser 16. The substance 18 may be a liquid substance, a paste, or a solid but
10 soluble substance. For dissolving a solid substance 18 for example, the dispenser 16 may be connected to a water mains, not shown, with water entering through an inlet 22 of the safety valve 10 and exiting the safety valve 10 through an outlet 24, in order to be directed to a
15 spraying element, not shown, where the water, which may be of a higher temperature and which may be pressurized, is sprayed onto the substance 18, in order to dissolve the substance 18 so that the substance 18 may be dosed in form of a fluid. The container 20 of the dispenser 16 may
20 comprise an opening 26 for refilling the substance 18 inside the container 20. The opening 26 is covered by an access cover 28 which is a rotary element 30 connected to the safety valve 10. The rotary element 30, the access cover 28, is a functional part 32 of the dispenser 16, as
25 the rotary element 30, i.e. the access cover 28, must be operated, for example lifted, by an operator for refilling the substance 18 inside the container 20 of the

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dispenser 16. By opening the access cover 28, the operator activates the safety valve 10 which immediately shuts off the water supply thus protecting the operator from being contaminated with the substance or being
5 sprayed by water or dissolved substance 18. The access cover 28 is designed in form of a framed lid wherein the frame 34 comprises a variable height around its circumference, wherein the height of the frame is designed in a way to provide an overlap 36 with the
10 container 20 of the dispenser 16. The overlap 36 is designed in a way that the access cover 28 overlaps the container 20 until the safety valve 10 is activated and the water supply interrupted.

15 Fig. 2 shows in the cross-sectional view the safety valve 10 in an opened position. The inlet 22 and the outlet 24 of the safety valve 10 are designed in form of removable connectors 38 which are arranged inside the valve housing 12 and comprise seals 40 in order to avoid a leakage of a
20 fluid, in particular the water. Inside the valve housing 12, a valve liner 42 is arranged, wherein the valve liner 42 comprises an inlet opening 44 corresponding to the inlet 22 and an outlet opening 46 corresponding with the outlet 24. Inside the cylindrical valve liner 42, a
25 cylindrical and at least partially hollow rotary slide 48 is arranged, wherein the rotary slide 48 is arranged rotatably around a first axis 50 inside and coaxially with the valve liner 42. The rotary slide 48 comprises a first valve port 52 cooperating with the inlet opening 44
30 and a second valve port 54 cooperating with the outlet opening 46. In the illustrated opened position, water enters the inlet 22, for example from the water mains,

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and passes through the inlet opening 44 through the first valve port 52 into the rotary slide 48, and then passing the second valve port 54 and the outlet opening 46 in order to exit the safety valve through the outlet 24. The first and second valve port 52, 54 and the inlet and outlet opening 44, 46 may be designed in form of slits arranged in parallel to the first axis 50. The edges of the valve port 52, 54 and the inlet and outlet opening 44, 46 may be designed in form of control edges 56, which cooperate in order to enable the closing of the inlet and/or outlet opening 44, 46 by rotating the rotary slide 48 and thus the valve port 52 and/or 54 around the first axis in order to close the safety valve and stop the flow of water.

15

In Fig. 3, the safety valve 10 is shown in a closed position, wherein in the closed position, the rotary slide 48 is rotated around the first axis by an opening angle α . The opening angle α is the angle by which the rotary slide 48 needs to be rotated from the opened position until the control edges 56 of for example the first valve port 52 and the inlet opening 44 meet, thus shutting off the flow of water by blocking the inlet opening 44 completely. The opening angle α shown in Fig. 3 may be about 6° . The rotary slide 48 may be rotated further, as shown in Fig. 4, for example by rotating the functional part, not shown, of the dispenser even further, wherein the functional part may be designed in form of an access cover 28, covering a container 20 holding a substance 18. In a position where the functional part of the dispenser may be fully opened, for example the access cover, the opening angle α may be

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about 90°. In this position, the safety valve is still in a closed position, although the water may pass through the inlet opening 44 and through the second valve port 54 into the inside of the rotary slide 48. As the outlet
5 port 46 is still closed and blocked by the rotary slide 48, no water may leave the safety valve, thus ensuring the function of the safety valve.

A functional part in form of an access cover 28 is shown
10 in Fig. 6A attached to the rotary slide 48 which is arranged inside the valve housing 12. In this position, the functional part 32 would be covering the opening not shown of the container not shown so that the safety valve
10 would be open allowing water to pass in order to
15 dissolve the soluble substance 18. If the access cover 28 would be opened by for example about 90°, as shown in Fig. 6B, the actuating of the access cover 28 would operate and rotate the rotary slide 48 of the safety
valve 10, thus closing the safety valve 10 and ensuring
20 the safety of the operator. The functional part 32 of the dispenser 16 in form of the access cover 28 may be connected to the rotary slide 48 by a positive locking connection 58. This ensures and provides a torque-proof connection of the access cover 28. The access cover 28 is
25 designed in form of a framed lid wherein the frame 34 comprises a variable height around its circumference. The variable height of the frame 34 is designed in a way that an opening, not shown, is covered until the opening angle α is reached, thus ensuring that an operator might not be
30 contaminated or sprayed when opening or operating the access cover 28.

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Fig. 7 shows that the access cover 28, which is the rotary element 30 of the safety valve, is connected by a positive locking connection 58 to the rotary slide 48. Enabling a rotation of the rotary element 30 around the first axis 50 at least until the opening angle α is reached, before an opening is accessible.

Fig. 8 shows a perspective view of a disassembled safety valve 10, the rotary slide 48 is designed in form of a cylindrical and at least partial hollow cylinder, comprising a positive locking connection 58 at its distal end, which in an assembled state would be arranged outside the valve housing 10. The rotary slide 48 comprises at least one first valve port 52, which is arranged in form of a control slit 60 in parallel to the first axis 50. The first valve port 52 corresponds in an assembled state to an inlet opening 44, which is also designed in form of a control slit 60, and which is arranged inside a cylindrical shaped valve liner 42. The valve liner 42 is connectable to the outside of the valve housing 12 by a support plate 62 and four connecting means 64, in form of screws. The inlet 22 and the outlet 24 are designed in form of removable connectors 38, which may be arranged inside the valve housing 12 and may be sealed by seals 40. In an assembled state, the rotary slide 48, which is at least partially arranged inside the valve liner 42, may also be sealed by seals 40 in order to avoid any leakage of the fluid to the outside of the safety valve 10.

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The particular combinations of elements and features in the above detailed embodiments are exemplary only; the

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interchanging and substitution of these teachings with other teachings in this and the patents/applications incorporate by reference are also expressly contemplated. As those skilled in the art will recognize, variations, 5 modifications, and other implementations of what is described herein can occur to those of ordinary skill in the art without departing from the spirit and the scope of the invention as claimed. Accordingly, the foregoing description is by the way of example only and is not 10 intending as limiting. In the claims, the wording "comprising" does not exclude other elements or steps, and the identified article "a" or "an" does not exclude a plurality. The mere fact that certain measures are recited in mutually different dependent claims does not 15 indicate that a combination of these measures cannot be used to advantage. The inventions scope is defined in the following claims and the equivalents thereto. Furthermore, reference signs used in the description and claims do not limit the scope of the invention as 20 claimed.

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List of reference signs

	10	safety valve
	12	valve housing
5	14	dispenser housing
	16	dispenser
	18	substance
	20	container
	22	inlet
10	24	outlet
	26	opening of container
	28	access cover
	30	rotary element
	32	functional part
15	34	frame
	36	overlap
	38	connector
	40	seal
	42	valve liner
20	44	inlet opening
	46	outlet opening
	48	rotary slide
	50	first axis
	52	first valve port
25	54	second valve port
	56	control edges
	58	positive locking connection
	60	control slit
	62	support plate
30	64	connecting means

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Claims

1. A safety valve, in particular for a dispenser (16) for dispensing a substance (18) in form of a fluid, comprising a valve housing (12) with at least one inlet (22) and at least one outlet (24) fluid permeable connected to an internally arranged inlet opening (44) and an internally arranged outlet opening (46), a rotary slide (48) with at least a first valve port (52), wherein the rotary slide (48) is rotatable around a first axis (50) into an opened and/or closed position, and at least one rotary element (30) connected to the rotary slide (48) for actuating the safety valve (10) by rotating the rotary element (30) into the opened and/or closed position, wherein in the opened position, the first valve port (52) and the rotary slide (48) cooperates with the inlet opening (44) and/or the outlet opening (46) in order to enable the flow of a fluid from the inlet (22) to the outlet (24), while blocking the flow of the fluid in the closed position, wherein the rotary element (30) is a functional part (32) of the dispenser (16).

2. The safety valve according to claim 1, characterized in that the at least first valve port (52) and the inlet opening (44) or outlet opening (46) are designed in form of cooperating control slits (60) comprising an opening angle α , in particular wherein $\alpha \leq 10^\circ$, preferably $\alpha \leq 6^\circ$, most preferably $\alpha \leq 4^\circ$.

3. The safety valve according to claim 1 or 2, characterized in that the functional part (32) of the dispenser (16) is an access cover (28) of the dispenser

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(16) for accessibly covering an opening (26) in the dispenser housing (14) or is a container (20) for holding the substance (18).

5 4. The safety valve according to claim 3, characterized in that the access cover (28) comprises a framed flap, in particular wherein the frame (34) of the flap comprises a variable height along its circumference

10 5. The safety valve according to any of the claims 1 to 4, characterized in that the valve housing (12) comprises a valve liner (42) for holding the rotary slide (48), wherein the valve liner (42) comprises the inlet opening (44) and/or the outlet opening (46).

15 6. The safety valve according to claim 5 characterized in that the valve liner (42) is at least partially arranged inside the valve housing (12) and/or is connected at the outside of the valve housing (12).

20 7. The safety valve according to any of the claims 1 to 6, characterized in that the rotary slide (48) is designed in form of an at least partial hollow cylinder, wherein at least the first valve port (52) is arranged in
25 a lateral area and/or a frontal area of the rotary slide (48).

8. The safety valve according to any of the claims 1 to 6, characterized in that the rotary slide (48) comprises
30 a flat area, wherein at least the first valve port (52) is arranged in the flat area of the rotary slide (48).

...

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9. The safety valve according to any of the claims 1 to 8, characterized in that the rotary slide (48) and the rotary element (30) are connected by a flange, a plug connection and/or a positive locking connection (58).

5

10. The safety valve according to any of the claims 1 to 9, characterized in that the inlet (22) and/or the outlet (24) is designed in form of a connector (38) removably connected to the valve housing (12).

10

11. A dispenser, in particular for dispensing a solid but soluble substance (18), for a flushing and/or spraying dosing system, comprising at least one safety valve (10) according to claims 1 to 10, and at least one
15 functional part (32).

12. A system, in particular a flushing and/or spraying dosing system, comprising at least one dispenser (16) according to claim 11 with at least one safety valve (10)
20 according to claims 1 to 10.

...

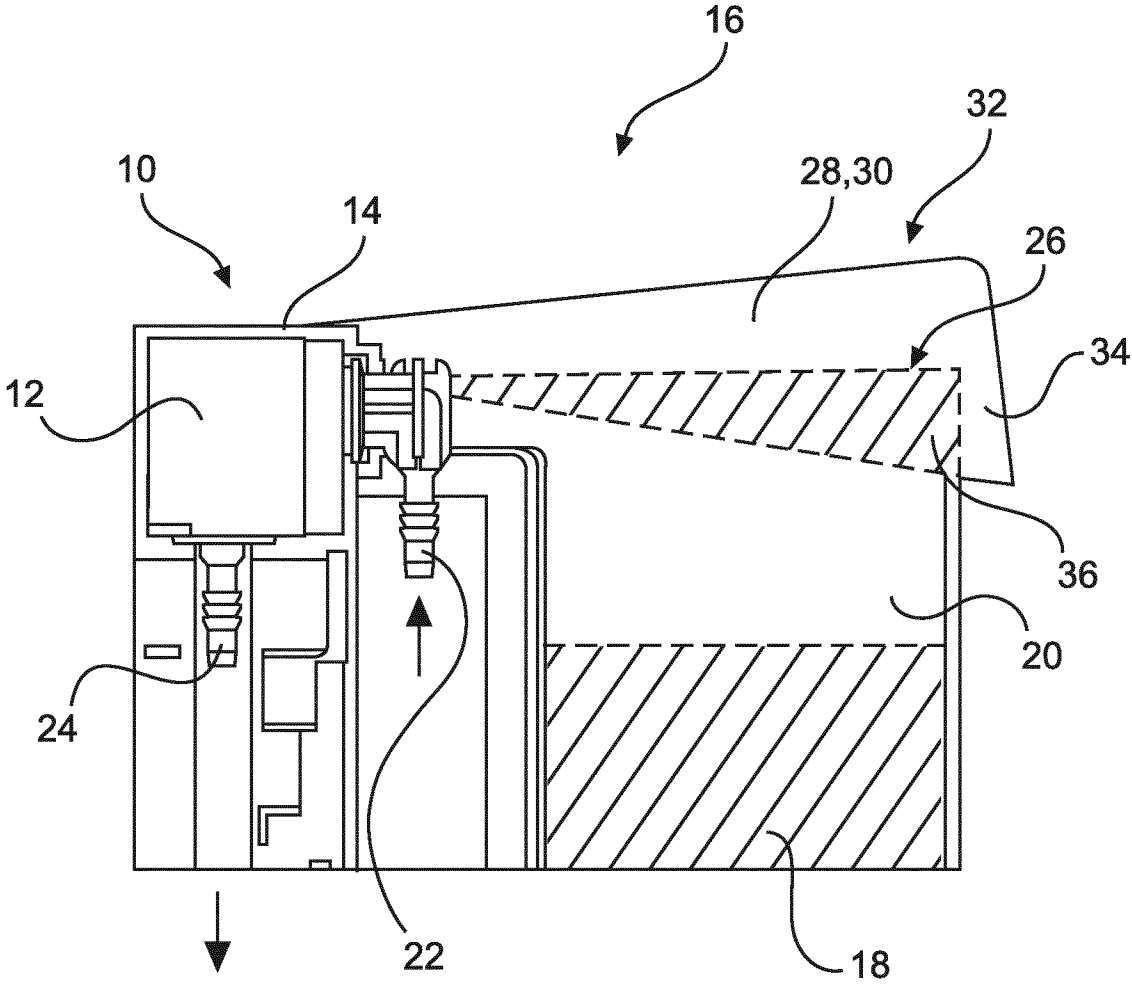


Fig. 1

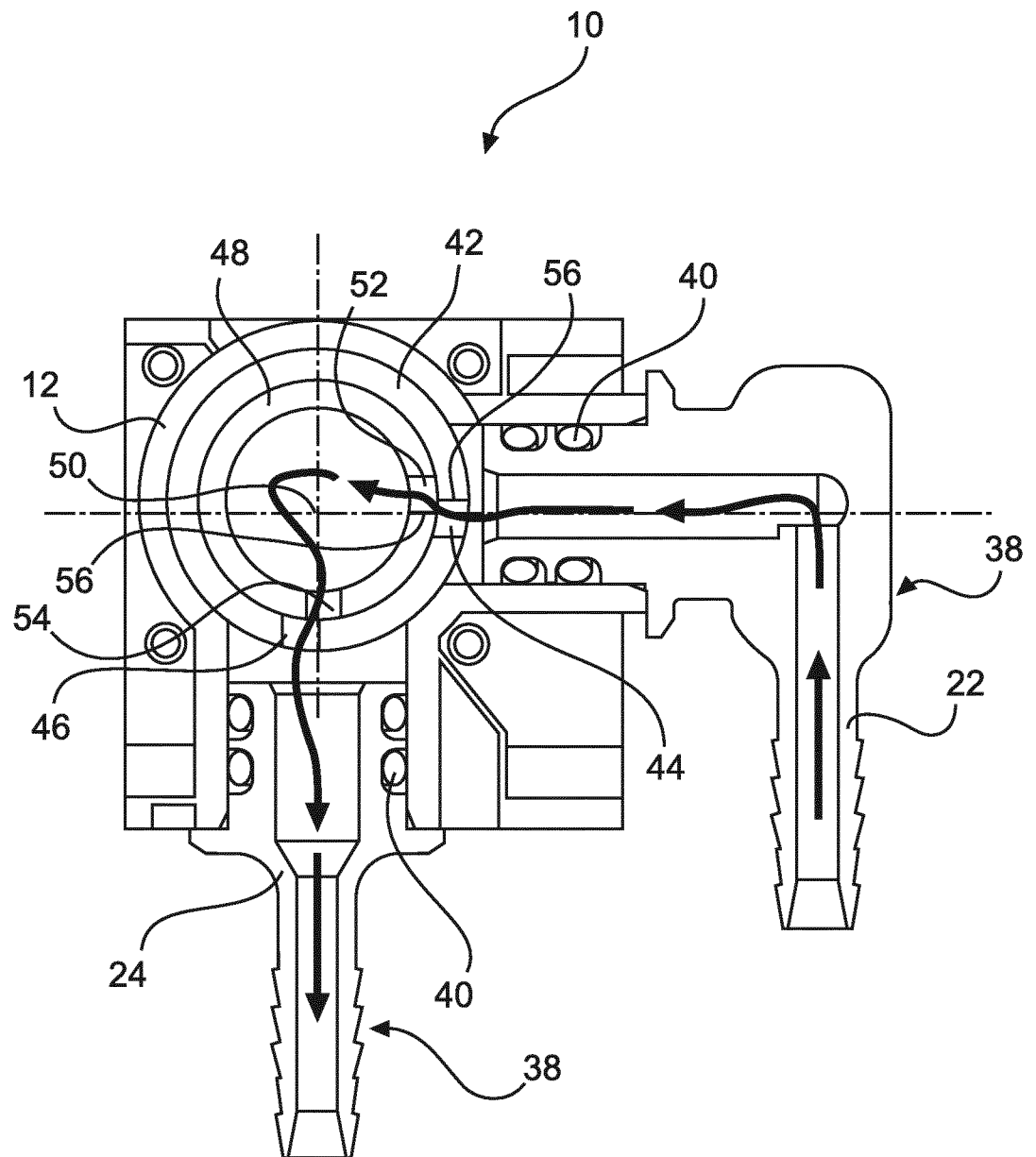


Fig. 2

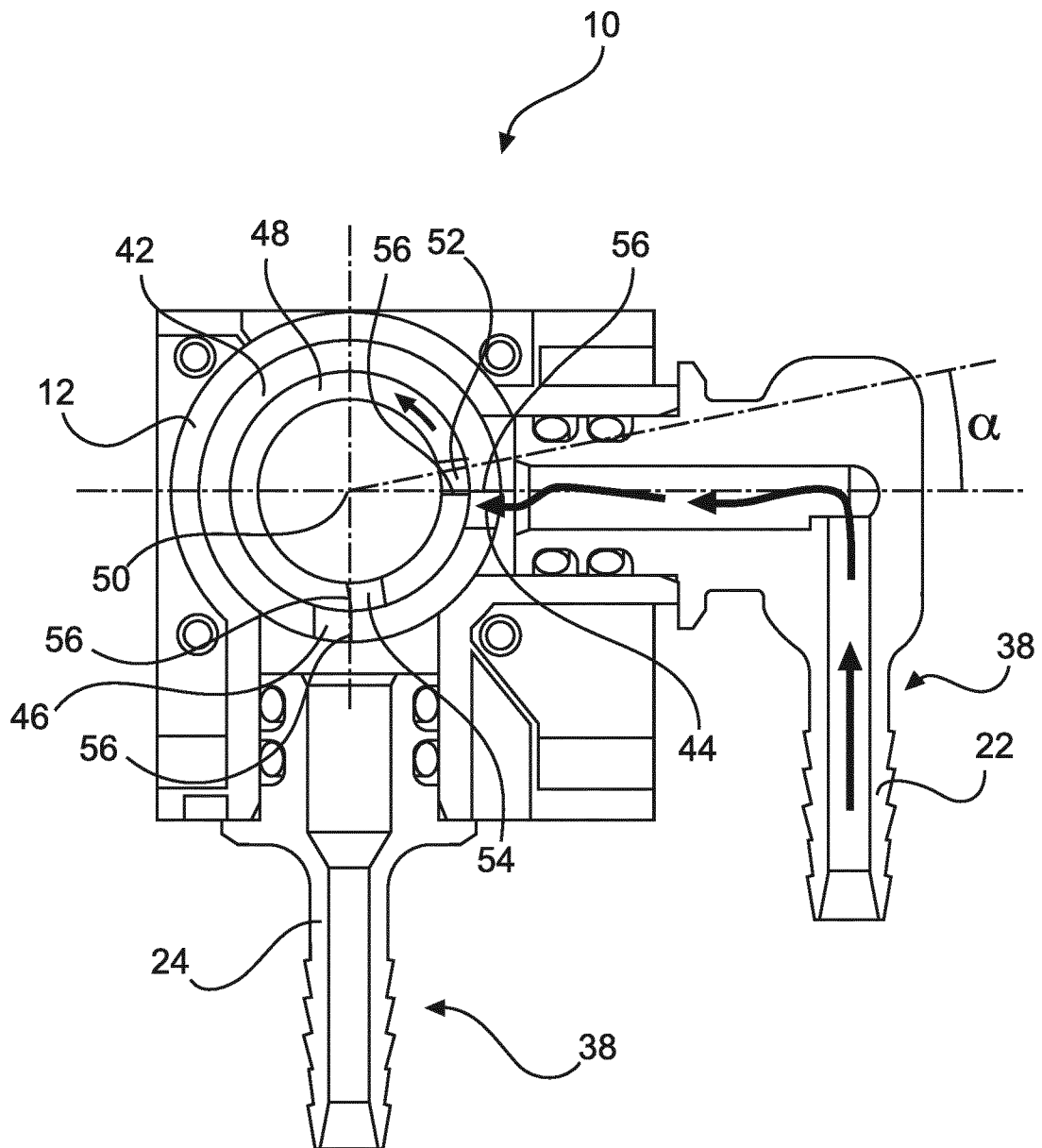


Fig. 3

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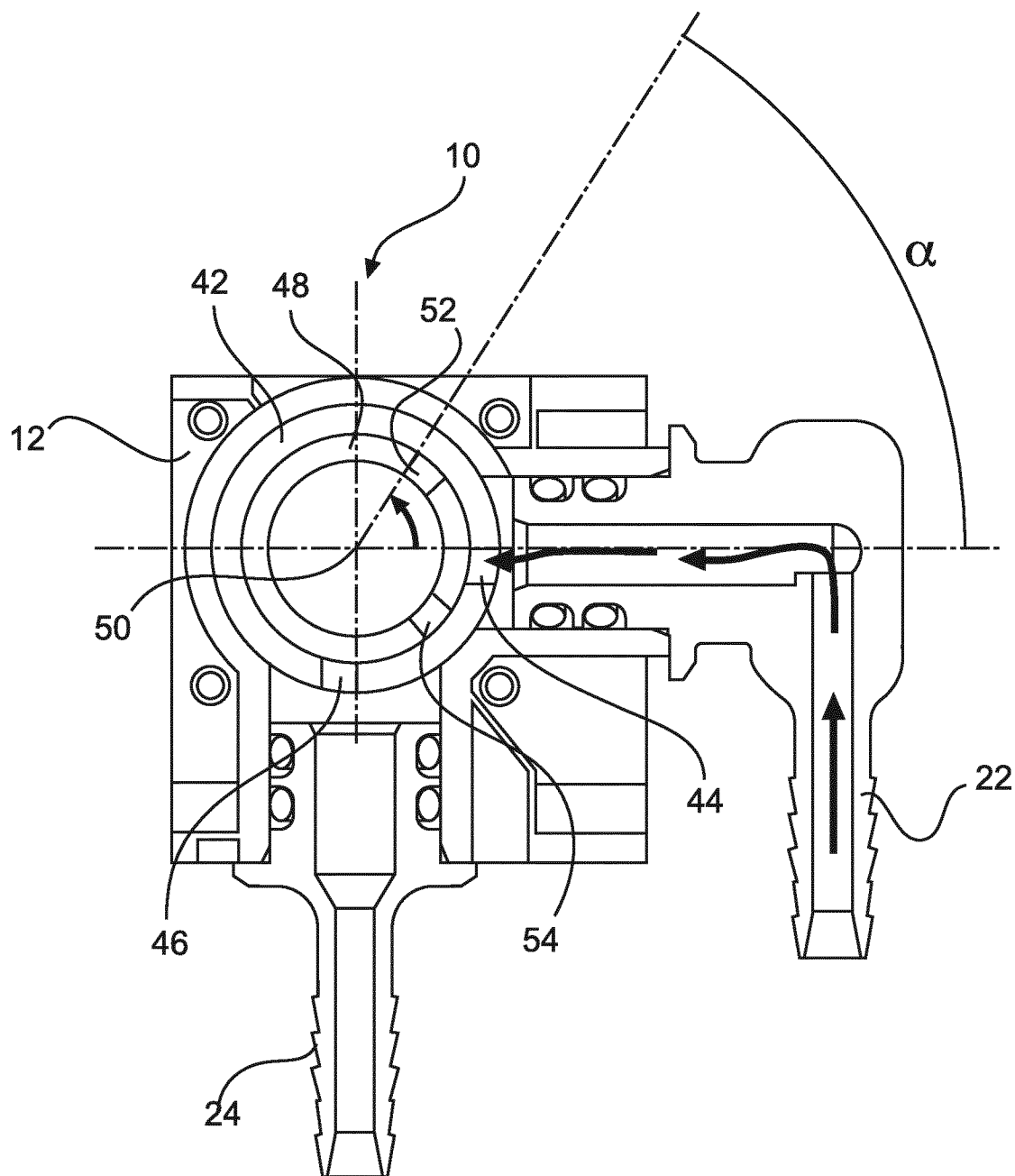
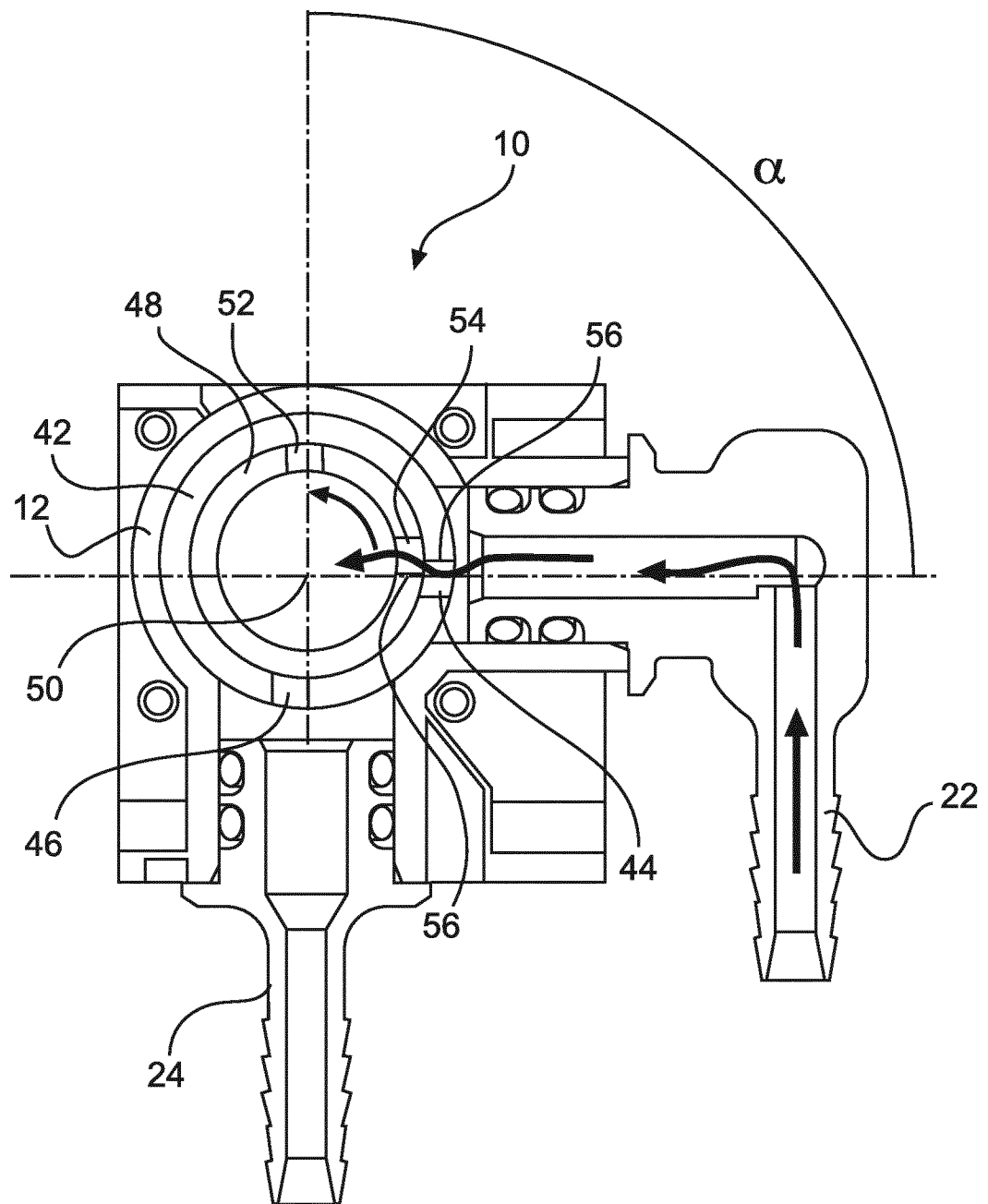


Fig. 4

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**Fig. 5**

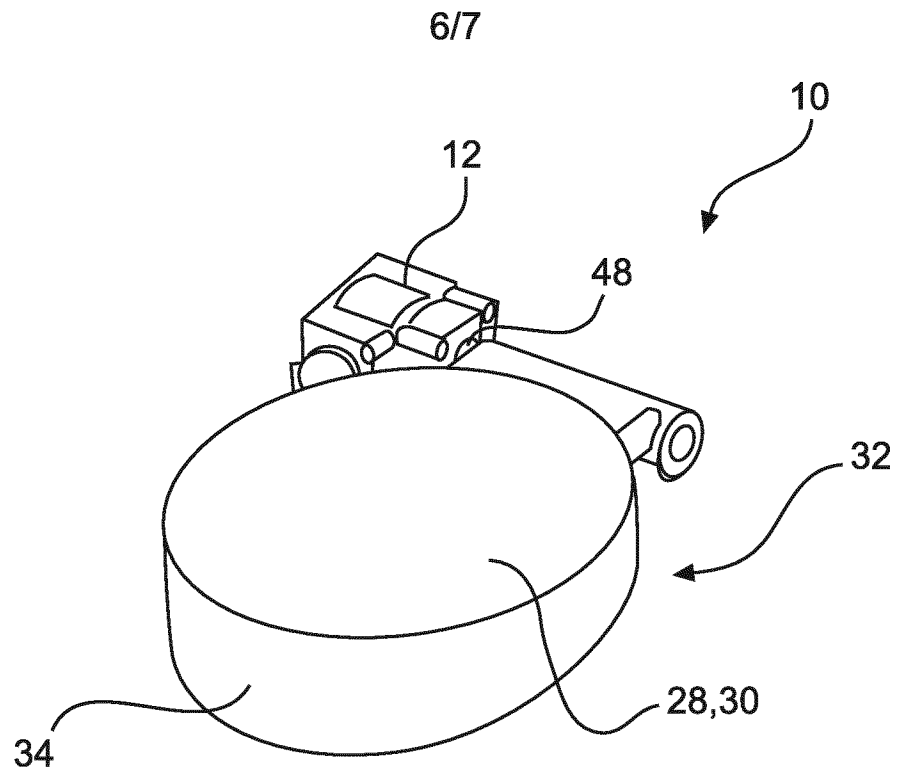


Fig. 6a

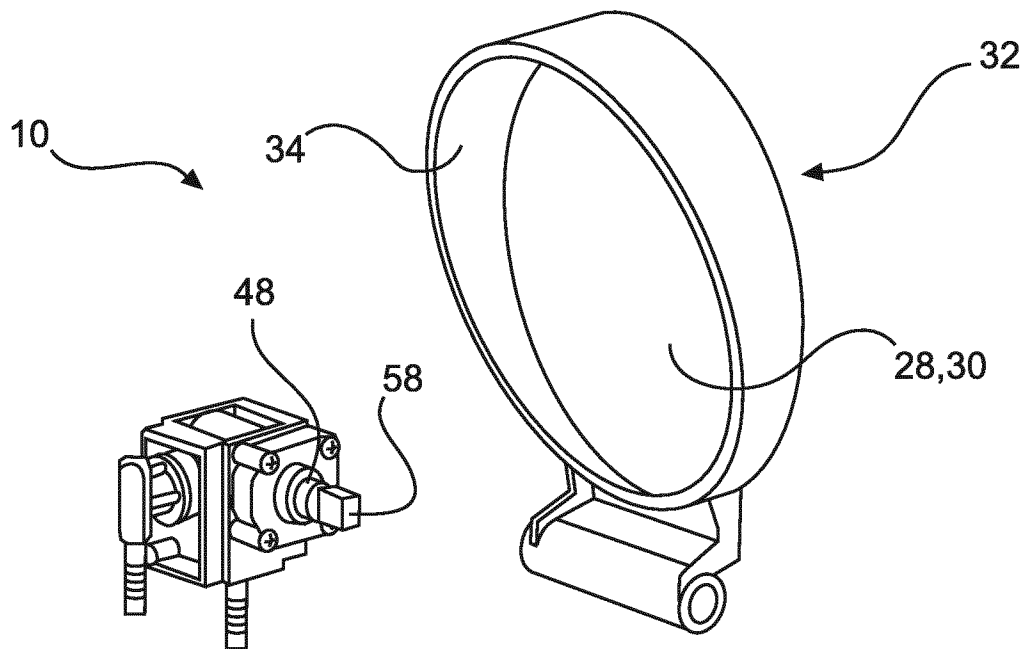


Fig. 6b

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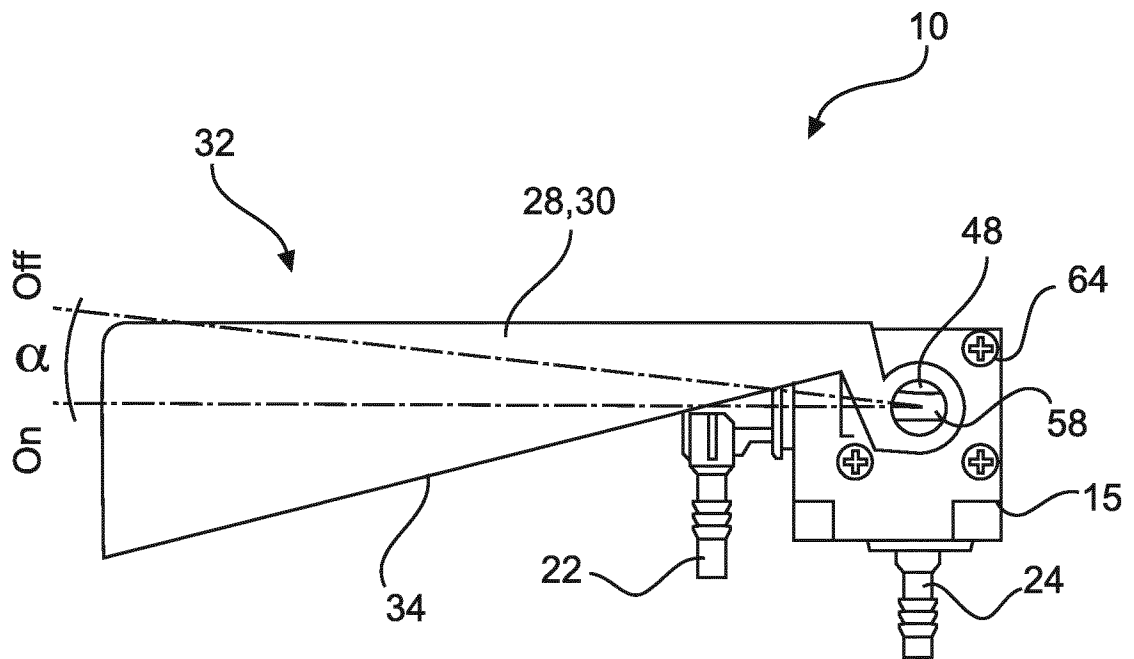


Fig.7

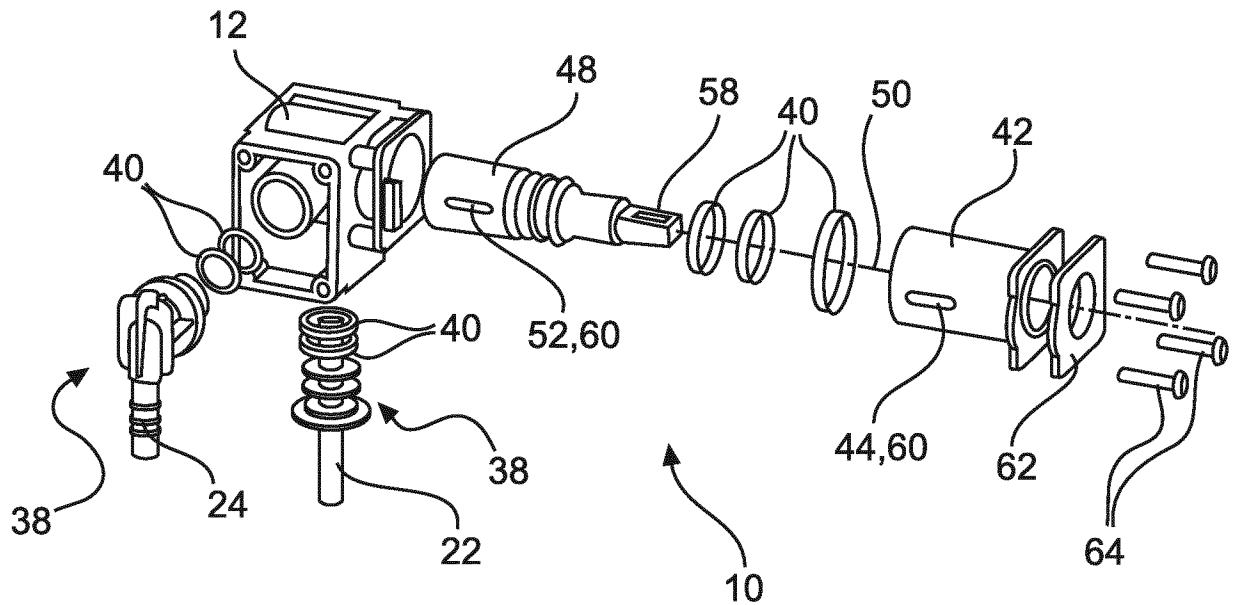


Fig.8

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2013/070315

A. CLASSIFICATION OF SUBJECT MATTER

INV. F16K5/04

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F16K B67D B65D E03D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 223 296 A (STRANGE WADDINGTON ROGOR ET AL) 14 December 1965 (1965-12-14)	1-4,7-12
Y	the whole document	5,6
Y	US 3 451 652 A (CO MAN KODAK) 24 June 1969 (1969-06-24) figure 1	5,6
X	GB 976 585 A (PHILLSCOPE LTD) 25 November 1964 (1964-11-25) the whole document	1-4,7-12
X	DE 857 777 C (DUNKER KARL) 1 December 1952 (1952-12-01) the whole document	1-4,7-12



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

23 May 2014

Date of mailing of the international search report

02/06/2014

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Rusanu, Irina

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2013/070315

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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DE 857777	C	01-12-1952	NONE	
