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(54) FLUID CONTROL SHUTOFF VALVE DEVICE AND SANITARY FLUID RECEPTACLE DEVICE

(57) A fluid control shutoff valve device for being used with sanitary receptacles such as washbasins or bathtubs comprising a fluid inlet structure (1), a fluid outlet structure (2), and a fluid pathway (3) leading from the fluid inlet structure to the fluid outlet structure, and a valve body (4) axially movable between a pushed-down closing position (4a) blocking the fluid pathway and a pushed-up open position (4b) unblocking the fluid pathway, wherein the valve body has a user-accessible push surface (5) forming a face end of the valve body. The fluid control shutoff valve device further comprises a push-push actuation mechanism (6) configured to move the valve body between the closing position and the open position. The invention further relates to a sanitary fluid receptacle device equipped with such fluid control shutoff valve device.

A stationary fringe surface (7) is provided having an access opening (8) through which the push surface of the valve body is accessed, where the push surface is located below the fringe surface when the valve body is in its closing position. The fluid inlet structure is located at least partly axially above an axial level of the push surface when the valve body is in its closed position, and is located below the fringe surface adjacent to a bottom side thereof.

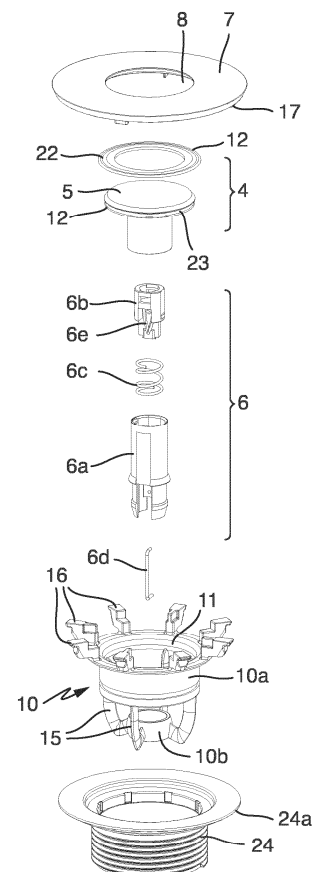


Fig. 1

Description

[0001] The invention relates to a fluid control shutoff valve device according to the preamble of claim 1 and to a sanitary fluid receptacle device according to the preamble of claim 9.

[0002] The fluid control shutoff valve device thus comprises a fluid inlet structure, a fluid outlet structure, and a fluid pathway leading from the fluid inlet structure to the fluid outlet structure, and a valve body axially movable between a pushed-down closing position blocking the fluid pathway and a pushed-up open position unblocking the fluid pathway, wherein the valve body has a user-accessible push surface forming a face end of the valve body. The fluid control shutoff valve device further comprises a push-push actuation mechanism configured to move the valve body between the closing position and the open position. The invention further relates to a sanitary fluid receptacle device equipped with such fluid control shutoff valve device.

[0003] Fluid control shutoff valve devices of this type and of similar types are widely known. The push surface of the valve device is arranged to be accessible for being pushed by the user and thus defines a user interface for operating the valve device by the user. By having the push-push actuation mechanism implemented, the valve device is of a so-called push-push type where the user acts by a push force on the push surface both to switch the valve from its closed to its open position and to switch the valve from its open to its closed position. The valve body is moved by this user actuation between the pushed-down closing position and the pushed-up open position. This means that these positions represent two different axial positions, i.e. two different positions on a same axis, where the valve body stably remains in each of these positions until being actuated by the user again. The axial direction here is thus understood to mean the direction parallel to the translational movement of the valve body, and the up and down directions are understood to refer to the respective axial movement direction of the valve body. Push-push actuation mechanisms of this type are conveniently known for use in such valve devices.

[0004] Such fluid control shutoff valve devices are used, for example, in sanitary equipment where a receptacle, such as a bathtub or a sink, is filled with water for use and the water is then discharged from the receptacle after use. For this purpose, the shutoff valve device is arranged preferably in a bottom region of the receptacle and can be closed and opened by the user to keep the water in the receptacle or discharge it therefrom, as desired. The fringe surface of the valve device may be arranged near to or flush with a surrounding part of the bottom region of the receptacle or may be an integral part of the receptacle. When using a spring for the push-push actuation mechanism, in a favourable option the spring force can be used perfectly to align the push button in the receptacle.

[0005] Fluid control shutoff valve devices of the type mentioned in the outset are disclosed in patent publication FR 2 712 165 B1 and utility model publication DE 20 2006 007 565 U1. In these prior art devices, the valve devices are arranged in a bottom region of a sanitary fluid receptacle, such as a bathtub or a sink, where the valve body in either of its pushed-down closing position and pushed-up open position protrudes with a push disk from the bottom of the receptacle, where an upper, outer surface of the push disk forms the push surface.

[0006] It is the technical problem underlying the invention to provide a fluid control shutoff valve device of the type mentioned at the outset which offers improvements over the prior art devices mentioned above as regards, in particular, low fabrication effort, reliable valve function, compact design and/or favourable appearance, and to provide a sanitary fluid receptacle device equipped with such fluid control shutoff valve device.

[0007] The invention solves this problem by providing a fluid control shutoff valve device having the features of claim 1 and a sanitary fluid receptacle device having the features of claim 9. Advantageous developments of the invention are specified in the dependent claims, the wording of which is hereby made part of the description by reference. This in particular includes all embodiments of the invention that result from the combinations of features which are covered by the dependencies of the dependent claims.

[0008] According to the invention a stationary fringe surface is provided having an access opening through which the push surface of the valve body is accessed. Stationary here means that the fringe surface remains unmoved when the valve body moves between its open and closed positions. The fringe surface may be established by a surface of a housing or other constructional element of the valve device or by a surface of a separate constituent assigned to the valve device, including the case that the fringe surface forms a surface region of a corresponding receptacle, such as a bathtub or a sink, in which the valve device is arranged. The push surface is located below the fringe surface when the valve body is in its pushed-down closing position. The fluid inlet structure is located at least partly axially above the push surface when the valve body is in its closed position, and/or the fluid inlet structure is located on the fringe surface or below the fringe surface adjacent to a bottom side thereof.

[0009] This configuration of the shutoff valve provides distinct advantages. The push surface of the valve body is maintained at an axial level below the fringe surface at least when the valve body is pushed down to its closing position. This is generally favourable in terms of the design and appearance of the valve device and its surrounding environment, such as, for example, a bottom wall of a sanitary or other receptacle. Although the push surface of the valve body is positioned below the axial level of the stationary fringe surface, it is easily accessible by the user through the access opening in the fringe

surface. An additional benefit is that in contrast to usual state of the art mechanisms the push button is not exposed in a way that may cause the user to accidentally open or close the shutoff valve. Another benefit is that a body part, e.g. lying in the bathtub, has no risk to collide with the normally uprising valve part or push surface.

[0010] Further, the push surface may preferably extend flush with the fringe surface when the valve body is pushed up to its open position. In any case, a height difference, i.e. axial distance, between the stationary fringe surface and the axially movable push surface can be kept comparatively low even when the valve body is in its pushed-up open position. This again is generally favourable in terms of the design and appearance of the valve device and its surrounding environment.

[0011] The fluid inlet structure is favourably adapted to this configuration of the stationary fringe surface and the movable push surface of the valve body in that it is located fully or partly at an axial level above the pushed-down push surface, i.e., when the valve body is in its pushed-down closing position, and/or located in the fringe surface itself, for example by providing one or more corresponding inlet openings therein, or below the fringe surface adjacent to a bottom side of the fringe surface, such as a bottom side of a fringe body having the fringe surface as its upper, outer surface.

[0012] In a development of the invention the fluid control shutoff valve device comprises a valve base body which includes an annular valve seat, and the valve body comprises a valve disk having an upper side which forms the push surface and having a valve seat contact region on a lower side cooperating with the annular valve seat. This configuration of the valve elements which accomplish the shutoff function of the valve, i.e., the valve base body with its valve disk on the one hand and the associated annular valve seat on the other hand, provides advantages regarding appearance and compactness as well as functional reliability of the valve device. The valve disk is used by its push surface as the user interface of the valve and at the same time provides the valve shutoff function by cooperating via its valve seat contact region with the annular valve seat. The valve body with its valve disk is axially moved relative to the stationary annular valve seat to selectively open and close the shutoff valve. In alternative embodiments, the valve seat contact region cooperating with the annular valve seat is provided on the valve body remote from the valve disk, if this may be desirable in corresponding appliances. In any case the valve base body preferably fits in a watertight manner in the fluid inlet structure to provide for a completely watertight valve. For this an O-ring may be used around the valve base body.

[0013] In a development of the invention the valve base body is pot-shaped comprising on an upper axial end region the annular valve seat and on a lower axial end region a support structure configured to support the push-push actuation mechanism and comprising an open sidewall structure between its axial end regions.

This construction of the valve base body is favourable in terms of compactness and reliable function as well as easy fabrication, assembling and disassembling of the valve device. Pot-shaped here means that it is not a completely closed pot but allows to have recesses or the like for fluid communication. The pot-shape of the valve base body enables to have the annular valve seat formed on one axial end region and the support structure for the push-push actuation mechanism on an opposite axial end region. The interior of the pot-shape can be used to allow the fluid to pass therethrough and to receive the push-push actuation mechanism which may have a substantially shaft-like constitution known as such. The sidewall of the pot-shape of the valve base body is formed with an open structure, that means it allows the fluid to pass through this sidewall structure. In alternative embodiments another, conventional construction may be used for the valve base body, or the push-push actuation mechanism on the one hand and the annular valve seat on the other hand may be arranged at two different body parts of the valve device.

[0014] In a refinement of the invention the push-push actuation mechanism comprises an actuation shaft supported on the support structure of the valve base body and axially extending to a central region of the valve disk on its lower side. This construction of the push-push actuation mechanism and its arrangement has advantages in combination with the pot-shape of the valve base body. The interior of the pot-shape can be used to receive the actuation shaft of the push-push actuation mechanism so that this actuation shaft can axially extend to the central region of the valve disk. The use of the interior of the valve base body to receive the actuation shaft supports a compact design of the valve device. Also, the valve base body and the push-push actuation mechanism can be easily disassembled, e.g. to remove hairs or replace broken/damaged parts. In alternative embodiments, a push-push actuation mechanism having another, conventional design may be used, or the push-push actuation mechanism may be arranged in a different, conventional manner in the valve device.

[0015] In another refinement of the invention the fluid inlet structure comprises at least one radial inlet opening located at an axial level between the valve seat and the fringe surface. This realization of the fluid inlet structure allows to have the fluid entering the valve device in radial direction at an axial level between the valve seat and the fringe surface. In this case, no axial inlet openings are needed in the fringe surface or the push surface to establish the fluid inlet structure. In addition, no inlet openings to allow the fluid to enter the valve device are needed in a surrounding environment where the valve device is installed. In alternative embodiments, the fluid inlet structure may comprise one or more axial inlet openings in the fringe surface and/or the push surface or valve disk of the valve body, or one or more inlet openings provided in a surrounding environment, such as a surrounding wall of a sanitary fluid receptacle. The

radial direction here means the direction orthogonal to the axial movement of the valve body and to the axial or length axis of the valve body.

[0016] In a further refinement of the invention the valve base body comprises an axial spacer structure between the fringe surface and the valve seat to provide the at least one radial inlet opening. This measure provides an easy way to establish the one or more radial inlet openings for the fluid inlet structure by having the axial spacer structure arranged at the valve base body. This spacer structure provides for axial space between the fringe surface and the valve seat which establishes the one or more radial inlet openings. The axial spacer structure may be an integral part of the valve base body or may be mounted thereto as a separately fabricated part. Preferably, the axial spacer structure may include a plurality of spacer elements equally distributed in peripheral direction on the valve base body. In a preferred embodiment the fringe surface can be attached to the spacer structure with a rotational open/close motion. In alternative embodiments, the one or more radial inlet openings may be formed in some other manner, for example by providing the valve base body with one or more radial bores at an axial level between the fringe surface and the valve seat.

[0017] In a still further refinement of the invention the fringe surface is provided by an upper surface of a fringe body mounted on the axial spacer structure. Advantageously, in this case, the axial spacer structure of the valve base body is used to support the fringe body, where the upper surface of the fringe body establishes the fringe surface. Preferably, the fringe body may be removably mounted on the axial spacer structure so that it can be removed therefrom, for example for maintenance and/or cleaning purposes. In alternative embodiments, the fringe body may be an integral part of the valve base body and its axial spacer structure.

[0018] In a development of the invention the valve body in its open position fluid-tightly closes the access opening of the fringe surface. By this measure, any fluid flow through the access opening of the fringe surface is prevented when the valve body is in its pushed-up open position. In other words, the access opening is not part of the fluid inlet structure.

[0019] Preferably, the push surface of the valve body is made to conform in shape with the access opening of the fringe surface, for example by providing both with a circular or oval or polygonal shape. This allows to substantially close the access opening of the fringe surface by the push surface of the valve body when the valve body is in its pushed-up open position, at least in an optical appearance, be it fluid-tightly or not. This can be advantageous in terms of the design and look of the valve device and its surrounding environment.

[0020] The sanitary fluid receptacle device according to the invention comprises a receptacle body, which may, for example, be a bathtub or sink, and further comprises a drain opening formed in the receptacle body and a fluid control shutoff valve device according to the invention

arranged in the drain opening. The sanitary fluid receptacle device according to the invention thus benefits from the effects and advantages of the fluid control shutoff valve device according to the invention as mentioned above by having this valve device implemented in the drain opening of its receptacle body.

[0021] In a development of the invention the fringe surface extends substantially flush with a surrounding part of the receptacle body or extends with a height difference to the surrounding part of the receptacle body which is lower than 10 mm, preferably lower than 5 mm, and more preferably lower than 3 mm. This measure further contributes to a desirable look and appearance of the arrangement of the receptacle body and the shutoff valve device implemented therein. Namely, any height difference between the fringe surface of the valve device and the surrounding part of the receptacle body is kept zero or at a comparatively low value which can be predetermined in accordance with the needs and the appliance at hand. As an additionally favourable feature of the invention, the height difference between the push surface of the valve body and the fringe surface can be kept comparatively low. For example, the push surface may extend flush with the fringe surface when the valve body is in its pushed-up open position, as mentioned above.

[0022] An advantageous embodiment of the invention is illustrated in the drawings. This and further embodiments of the invention will be explained in more detail below. In the drawings:

- Fig. 1 is a perspective exploded top view of an exemplary embodiment of the fluid control shutoff valve device according to the invention,
- Fig. 2 is a perspective exploded bottom view of the fluid control shutoff valve device of Fig. 1,
- Fig. 3 is perspective view of the fluid control shutoff valve device of Fig. 1 with a valve body in a pushed-down closing position,
- Fig. 4 is a perspective view of a bottom part of a receptacle body of a sanitary fluid receptacle device with the fluid control shutoff valve device of Fig. 1 implemented therein and in the closed position of its valve body,
- Fig. 5 is a longitudinal sectional view of the fluid control shutoff valve device of Fig. 1 with its valve body in the pushed-down closing position,
- Fig. 6 is the perspective view of Fig. 3 with the valve body in the pushed-up open position,
- Fig. 7 is the perspective view of Fig. 4 with the valve body in the pushed-up open position, and
- Fig. 8 is the sectional view of Fig. 5 with the valve

body in the pushed-up open position.

[0023] As illustrated in the drawings, showing an exemplary embodiment, the fluid control shutoff valve device according to the invention comprises a fluid inlet structure 1, a fluid outlet structure 2, and a fluid pathway 3 which extends in the valve device from the fluid inlet structure 1 to the fluid outlet structure 2. The valve device further comprises a valve body 4 which is axially movable between a pushed-down closing position 4a blocking the fluid pathway 3 and a pushed-up open position 4b unblocking the fluid pathway 3. Due to this characteristic, a valve body like the valve body 4 is also commonly called valve closure body.

[0024] The shutoff valve device further comprises a push-push actuation mechanism 6 configured to move the valve body 4 axially and thus translationally between the closing position 4a and the open position 4b. Any conventional construction of the push-push actuation mechanism 8 can be used which is known as such to the skilled person and thus needs no further explanation here.

[0025] The valve body 4 comprises a user-accessible push surface 5 which forms a face end of the valve body 4. The push surface 5 thus constitutes a user interface which can be accessed by the user to operate the valve device. More specifically, the user directly actuates the movable valve body 4 of the valve device by pushing its push surface 5 and with the assistance of the push-push actuation mechanism 6. The push surface 5 may preferably not be a convex surface but, e.g., a level surface.

[0026] For the shutoff valve device according to the invention, a stationary fringe surface 7 is provided which comprises an access opening 8 through which the push surface 5 of the valve body 4 is accessed. The fringe surface 7 is arranged such that the push surface 5 is located below the fringe surface 7 when the valve body 6 is in its pushed-down closing position 4a. The fringe surface 7 may preferably be a level surface.

[0027] This characteristic can further be used, if desired, to have the push surface 5 of the valve body 4 in its pushed-up open position 4b not substantially protruding above the surrounding fringe surface 7. In particular, in corresponding embodiments like the embodiment shown, the push surface 7 of the valve body 4 extends substantially flush with the surrounding fringe surface 7 when the valve body 4 is in its pushed-up open position 4b, as best seen in Figs. 6 to 8. This feature is favourable for many appliances of the shutoff valve device, in particular when used on a bottom part of a sanitary receptacle, such as a bathtub or a sink. More specifically, the push surface 5 and the fringe surface 7 together may form a planar surface in the pushed-up open position 4b of the valve body 4.

[0028] The fluid inlet structure 1 of the shutoff valve device is located completely or partly at an axial level above the push surface 5 when the valve body 4 is in its pushed-down closing position 4a, and/or it is located in

the fringe surface 7 or below the fringe surface 7 adjacent to a bottom side 9 of the fringe surface 7. In the embodiment shown, the fluid inlet structure 1 is located substantially above the pushed-down location of the push surface 5, i.e. with the valve body 4 in its closing position 4a, and it is located below the fringe surface 7 adjacent its bottom side 9.

[0029] In advantageous embodiments, like the embodiment shown, the shutoff valve device comprises a valve base body 10 on which an annular valve seat 11 is formed. Further, the valve body 4 comprises a valve disk 12 having an upper side which forms the push surface 5. The valve disk 12 comprises a valve seat contact region 13. This valve seat contact region 13 cooperates with the valve seat 11. That means, the valve is closed by bringing the valve seat contact region 13 in abutting, fluid-tight contact against the valve seat 11, while the valve is opened by moving the valve seat contact region 13 away from the valve seat 13. The fluid pathway 3 passes through the interior of the annular valve seat 11 and can thus be blocked by the valve body 4 when the valve body 4 in the closing position 4a abuts with its valve seat contact region 13 against the annular valve seat 11.

[0030] In advantageous embodiments, like the embodiment shown, the valve base body 10 is pot-shaped and comprises the valve seat 11 on an upper axial end region and a support structure 14 on a lower axial end region, where the support structure 14 is configured to support the push-push actuation mechanism 6. Further, the valve base body 10 comprises an open sidewall structure 15 between its axial end regions. In corresponding embodiments, like the embodiment shown, the valve seat 11 is formed on an axial outer side of a sleeve-shaped part 10a of the valve base body 10, and the support structure 14 is formed by another sleeve-shaped part 10b of the valve base body 10 having a sleeve diameter lower than that of the sleeve-shaped part 10a carrying the valve seat 11. The open sidewall structure 15 in this example consists of a plurality of support arms equally distributed in peripheral direction, where each support arm extends between the two sleeve-shaped parts 10a, 10b.

[0031] The push-push actuation mechanism 6 can be of any conventional construction suited for the present case. In corresponding embodiments, the push-push actuation mechanism 6 comprises, as in the embodiment shown, an actuation shaft supported on the support structure 14 of the valve base body 10. The actuation shaft axially extends from the support structure 14 to a central region of the valve disk 12 on the lower side of the valve disk 12, as best seen in Figs. 5 and 8. In the embodiment shown, the actuation shaft of the push-push actuation mechanism 6 comprises a holding sleeve part 6a configured to be snap-connected to the support structure 14, a valve body coupling part 6b fixedly mounted to the lower side of the valve disk 12 and comprising a heart-shaped cam track 6e, a pin-like cam element 6d comprising a cam cooperating with the cam track 6e, and a biasing spring 6c between the holding sleeve part 6a

and the valve body coupling 6b. In this configuration, the push-push actuation mechanism 6 defines the two different axial positions of the valve body 4, i.e. the pushed-down closing position 4a and the pushed-up open position 4b, by a corresponding lower and upper rest position of the cam in the heart-shaped cam track 6e, as best seen in Figs. 5 and 8.

[0032] In corresponding embodiments, as in the embodiment shown, the fluid inlet structure 1 comprises at least one radial inlet opening 1a located at an axial level between the valve seat 11 and the fringe surface 7. In the embodiment shown, the fluid inlet structure 1 comprises a plurality of radial inlet openings 1a equally distributed in peripheral direction.

[0033] In corresponding realizations, the valve base body 10 comprises an axial spacer structure 16 between the fringe surface 7 and the valve seat 11 to provide the at least one radial inlet opening 1a, as in the embodiment shown. More specifically, in the embodiment shown, the axial spacer structure 16 comprises a plurality of spacer elements equally distributed in peripheral direction and protruding in axial and radially outward direction from a radial flange 10c of the sleeve part 10a of the valve base body 10. The spaces left in peripheral direction between the axial spacer elements of the spacer structure 16 define the radial inlet openings 1a of the fluid inlet structure 1.

[0034] In advantageous embodiments, like the embodiment shown, the fringe surface 7 is provided on an upper surface of a fringe body 17 mounted on the axial spacer structure 16. In the embodiment shown, the fringe body 17 is mounted on the axial spacer elements of the axial spacer structure 16 via a bayonet coupling 21. Alternatively, any other conventional connection means can be used, preferably a rotational open/close motion or other releasable connection means.

[0035] In corresponding embodiments, like the embodiment shown, the valve body 4 in its open position 4b fluid-tightly closes the access opening 8 of the fringe surface 7. In the embodiment shown, a sealing ring 22 is used, as best seen in Fig. 8, where this sealing ring 22 is used to seal the access opening 8 as well as to establish the valve seat contact region 13 of the valve body 4. In other words, in the closing position of the valve body 4, the sealing ring 22 is fluid-tightly pressed against the valve seat 11 with its lower side, while in the open position of the valve body 4, the sealing ring 22 is fluid-tightly pressed with its upper side against a lower side of the fringe body 17 in its portion surrounding the access opening 8. The sealing ring 22 is thus a sealing means of the valve body 4 and more specifically of the valve disk 12. To this end, a radial outer groove 23 is formed along the periphery of the valve disk 12 in which the sealing ring 22 is received.

[0036] In corresponding embodiments, like the embodiment shown, the valve device further comprises a sleeve connection part 24 having an outer thread for threadedly connecting the valve device to a successive

downstream fluid guidance system, such as a fluid discharge or drain system. For example, the valve device may be threadedly connected through the sleeve connection part 24 to an inlet of a drain device or water discharge tube as used, for example, at the outlet of sanitary bathtubs, sinks, and shower drain systems. The pot-shaped valve base body 10 is inserted into the sleeve connection part 24 such that its sleeve-shaped part 10a with the axial spacer structure 16 rests with its flange 10c on a supporting radial flange 24a of the sleeve connection part 24. A sealing element, not shown in the drawings, may be arranged between the radial flange 24a and the sanitary fluid receptacle device. The bottom end of the valve base body 10 and of the sleeve connection part 24 establishes the fluid outlet structure 2 in this case.

[0037] Figs. 4 and 7 show the exemplary illustrated shutoff valve device according to the invention used to controllably open and close a sanitary receptacle. In other words, Figs. 4 and 7 show an exemplary embodiment of the sanitary receptacle device according to the invention, which receptacle device may, for example, be a bathtub or sink. As seen from Figs. 4 and 7, the sanitary receptacle device of the invention comprises a receptacle body 18, a drain opening 19 formed in the receptacle body 18, and a fluid control shutoff valve device 20 inserted into the drain opening 19, where the fluid control shutoff valve device according to the invention is used for this shutoff valve device. The sanitary receptacle device is only shown partly in an environment of the shutoff valve device 20. More specifically, Fig. 4 shows the arrangement with the shutoff valve device in the closed position having the valve body 4 with its push surface 5 pushed-down, while Fig. 7 shows the arrangement with the shutoff valve device in its open position having the valve body 4 and thus its push surface 5 pushed-up.

[0038] In advantageous embodiments, like the embodiment shown, the fringe surface 7 of the shutoff valve device 20 extends substantially flush with a surrounding part of the receptacle body 18, as seen in Figs. 4 and 7. Alternatively, there may be some minor height difference between the fringe surface 7 and a surrounding part of the receptacle body 18, which height difference may preferably be no more than 10 mm and, if desired, more specifically not more than 5 mm or not more than 3 mm.

[0039] This characteristic favourably adds to the characteristic that the push surface 5 of the valve body 4 axially remains at or below the level of the fringe surface 7, as explained above. In this case, the implementation of the shutoff valve device 20 in the receptacle body 18 shows an advantageous design and appearance, where the push surface 5 does not or at least not remarkably protrude upwards from the level of the fringe surface 7, and the fringe surface 7 in turn does not substantially protrude upwards from the surrounding part of the receptacle body 18, if at all.

[0040] As apparent from the embodiment shown and the other embodiments explained above, the invention

provides an advantageous fluid control shutoff valve device which has improvements over the prior art in particular concerning compact design, favourable appearance low fabrication effort, and/or reliable valve function. Specifically, this shutoff valve device allows for having it compactly integrated in a sanitary fluid receptacle, such as a bathtub or a sink, or other fluid storing receptacle with a favourable look in that the valve body may end with its push surface substantially flush with a surrounding region of the receptacle in particular when the valve body is in its open position.

Claims

1. Fluid control shutoff valve device, preferably sanitary shut-off valve device, comprising

- a fluid inlet structure (1), a fluid outlet structure (2), and a fluid pathway (3) leading from the fluid inlet structure (1) to the fluid outlet structure (2),
- a valve body (4) axially movable between a pushed-down closing position (4a) blocking the fluid pathway (3) and a pushed-up open position (4b) unblocking the fluid pathway (3), wherein the valve body (4) has a user-accessible push surface (5) forming a face end of the valve body (4), and
- a push-push actuation mechanism (6) configured to move the valve body (4) between the closing position (4a) and the open position (4b),

characterized in that

- a stationary fringe surface (7) is provided having an access opening (8) through which the push surface (5) of the valve body (4) is accessed, where the push surface (5) is located below the fringe surface (7) when the valve body (4) is in its closing position (4a), and
- the fluid inlet structure (1) is located at least partly axially above the push surface (5) when the valve body (4) is in its closing position (4a), and/or is located in the fringe surface (7) or below the fringe surface (7) adjacent to a bottom side (9) of the fringe surface (7).

2. Fluid control shutoff valve device according to claim 1, further **characterized in that** it comprises a valve base body (10) which includes an annular valve seat (11), and **in that** the valve body (4) comprises a valve disk (12) having an upper side which forms the push surface (5) and having a valve seat contact region (13) on a lower side cooperating with the valve seat (11).
3. Fluid control shutoff valve device according to claim 2, further **characterized in that** the valve base body

(10) is pot-shaped comprising on an upper axial end region the valve seat (11) and on a lower axial end region a support structure (14) configured to support the push-push actuation mechanism (6) and comprising an open sidewall structure (15) between its axial end regions.

4. Fluid control shutoff valve device according to claim 3, further **characterized in that** the push-push actuation mechanism (6) comprises an actuation shaft (6a) supported on the support structure (14) of the valve base body (10) and axially extending to a central region of the valve disk (12) on its lower side.

5. Fluid control shutoff valve device according to any of claims 2 to 4, further **characterized in that** the fluid inlet structure (1) comprises at least one radial inlet opening (1a) located at an axial level between the valve seat (11) and the fringe surface (7).

6. Fluid control shutoff valve device according to claim 5, further **characterized in that** the valve base body (10) comprises an axial spacer structure (16) between the fringe surface (7) and the valve seat (11) to provide the at least one radial inlet opening (1a).

7. Fluid control shutoff valve device according to claim 6, further **characterized in that** the fringe surface (7) is provided by an upper surface of a fringe body (17) mounted on the axial spacer structure (16).

8. Fluid control shutoff valve device according to any of claims 1 to 7, further **characterized in that** the valve body (4) in its open position (4b) fluid-tightly closes the access opening (8) of the fringe surface (7).

9. Sanitary fluid receptacle device, preferably a bathtub or sink device, comprising a receptacle body (18), a drain opening (19) formed in the receptacle body (18), and a fluid control shutoff valve device (20) arranged in the drain opening, **characterized in that** the fluid control shutoff valve device is one according to any of claims 1 to 8.

10. Sanitary fluid receptacle device according to claim 9, further **characterized in that** the fringe surface (7) extends substantially flush with a surrounding part of the receptacle body (18) or extends with a height difference to the surrounding part of the receptacle body (18) which is lower than 10 mm, preferably lower than 5 mm, and more preferably lower than 3 mm.

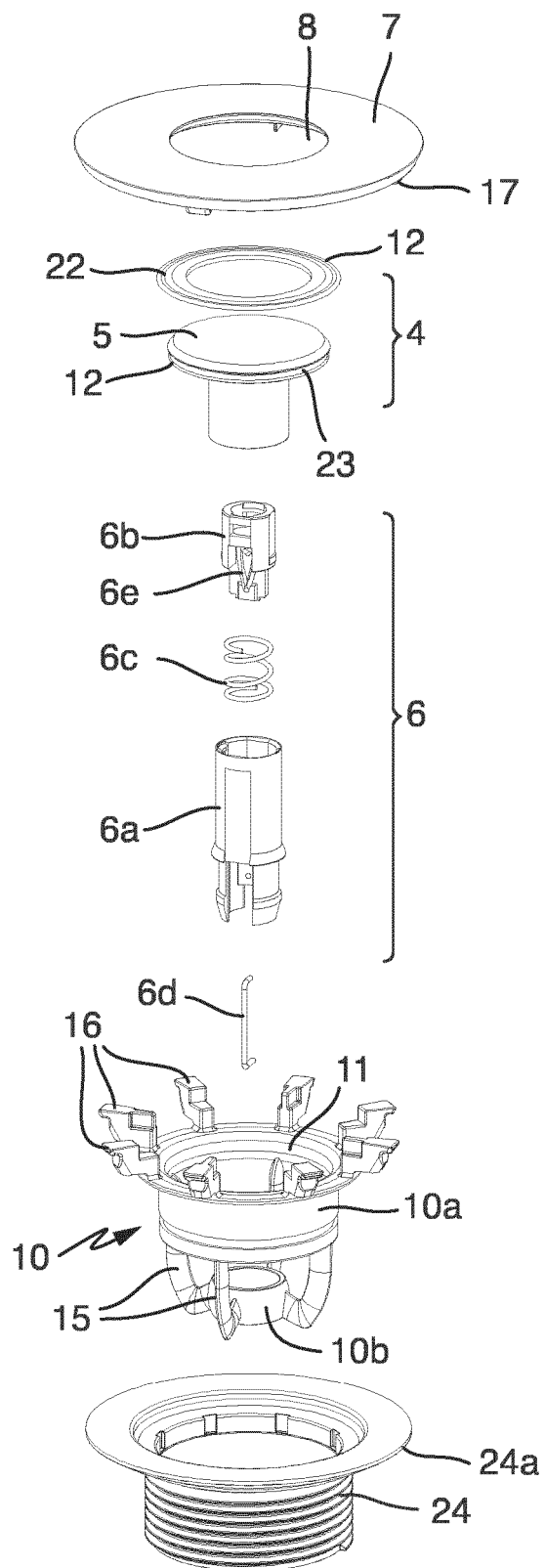


Fig. 1

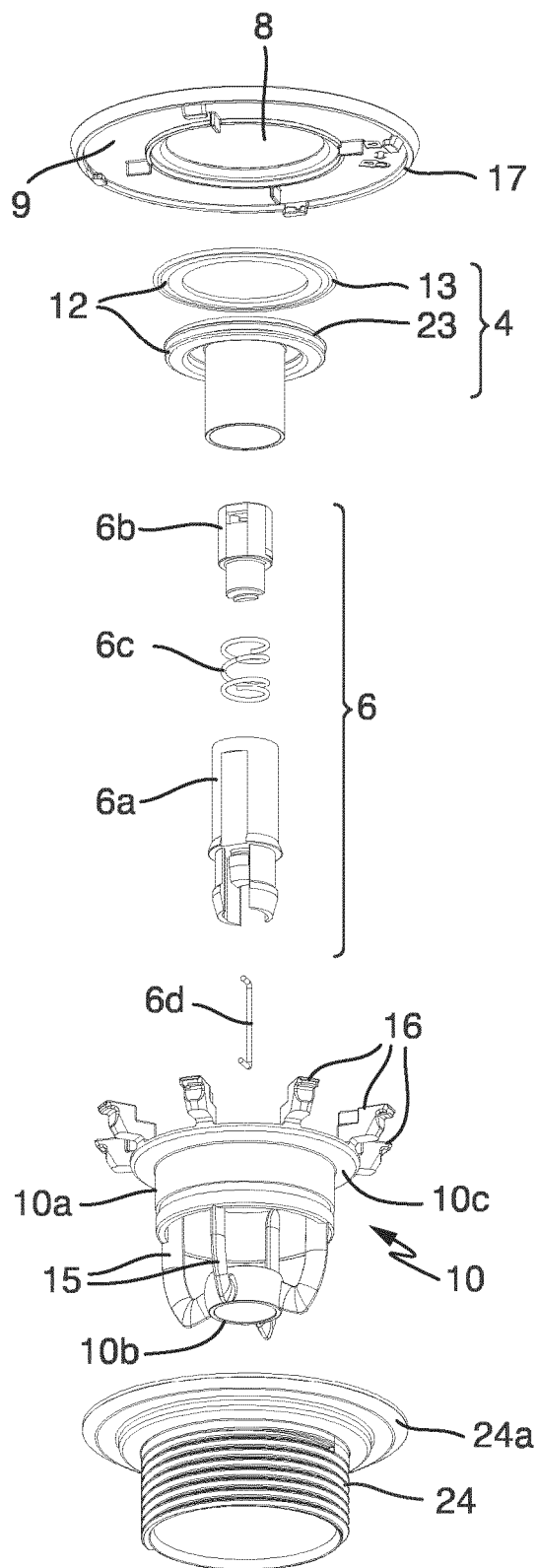
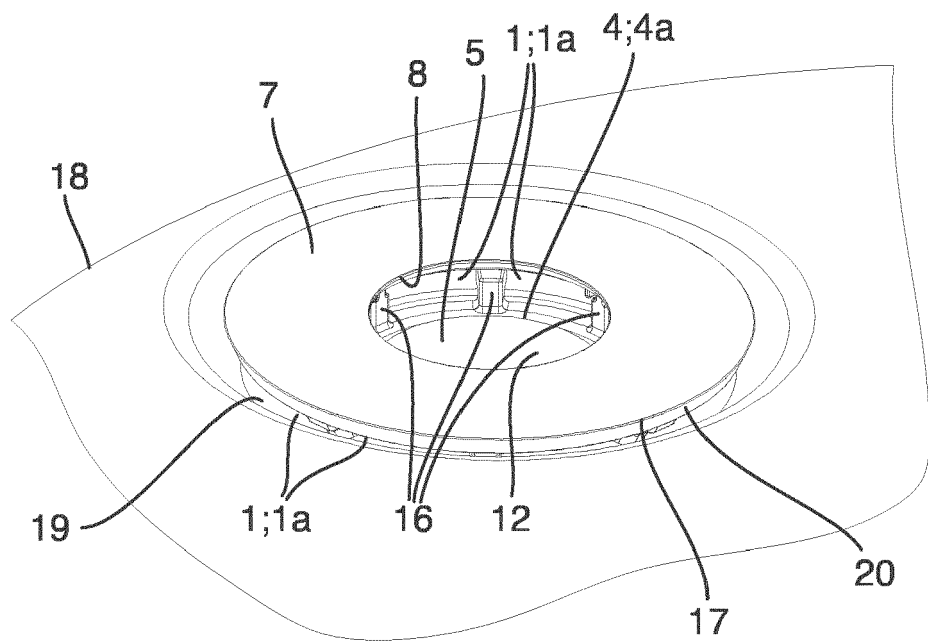
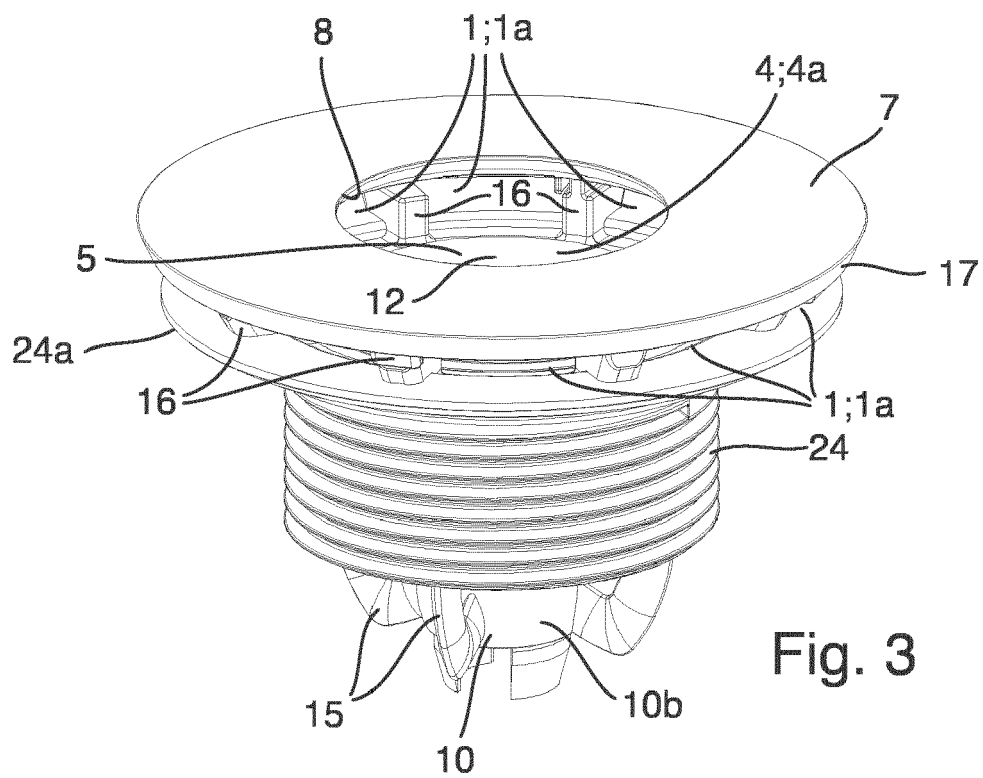
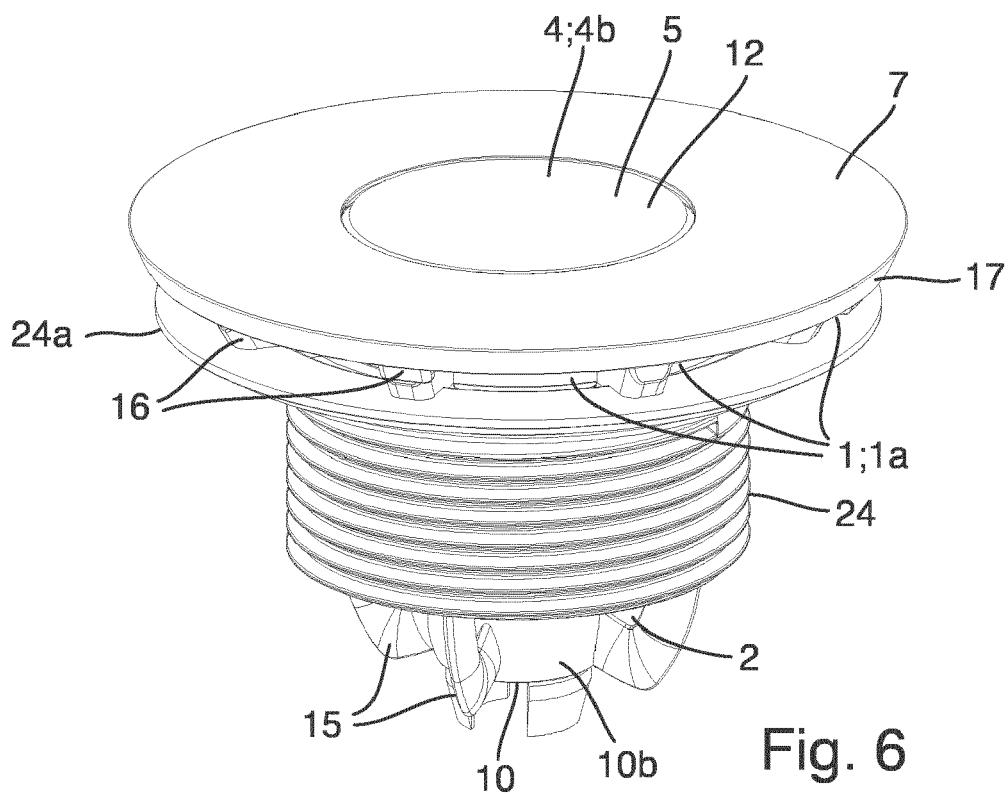
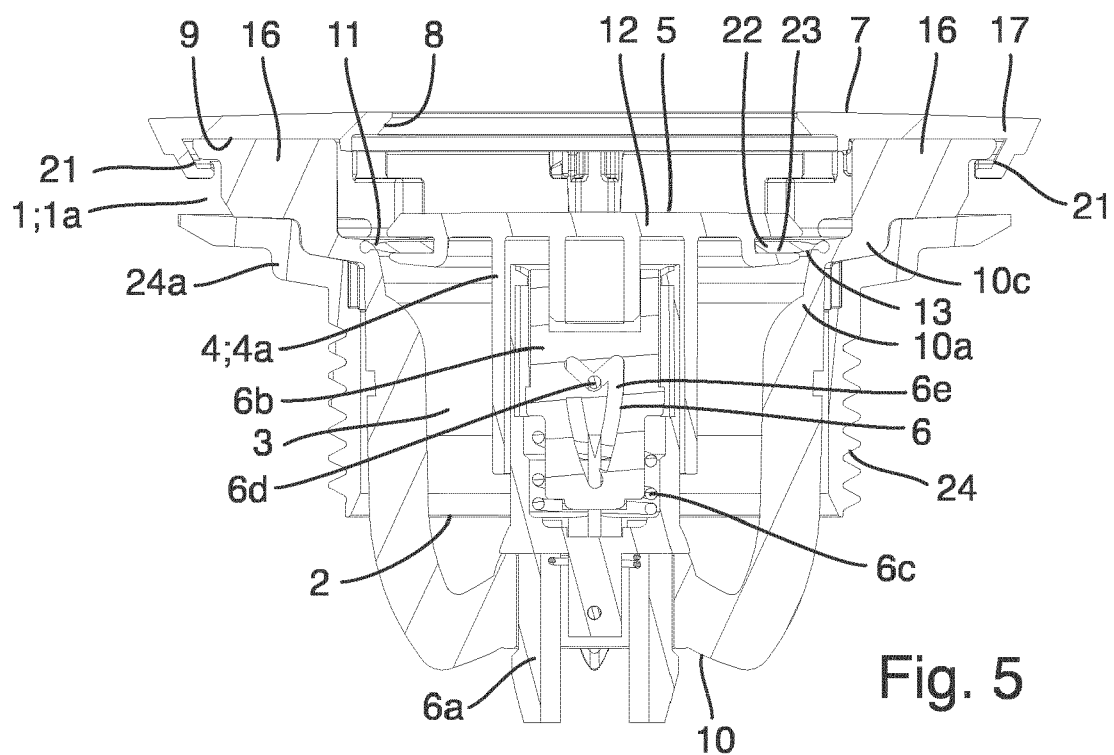
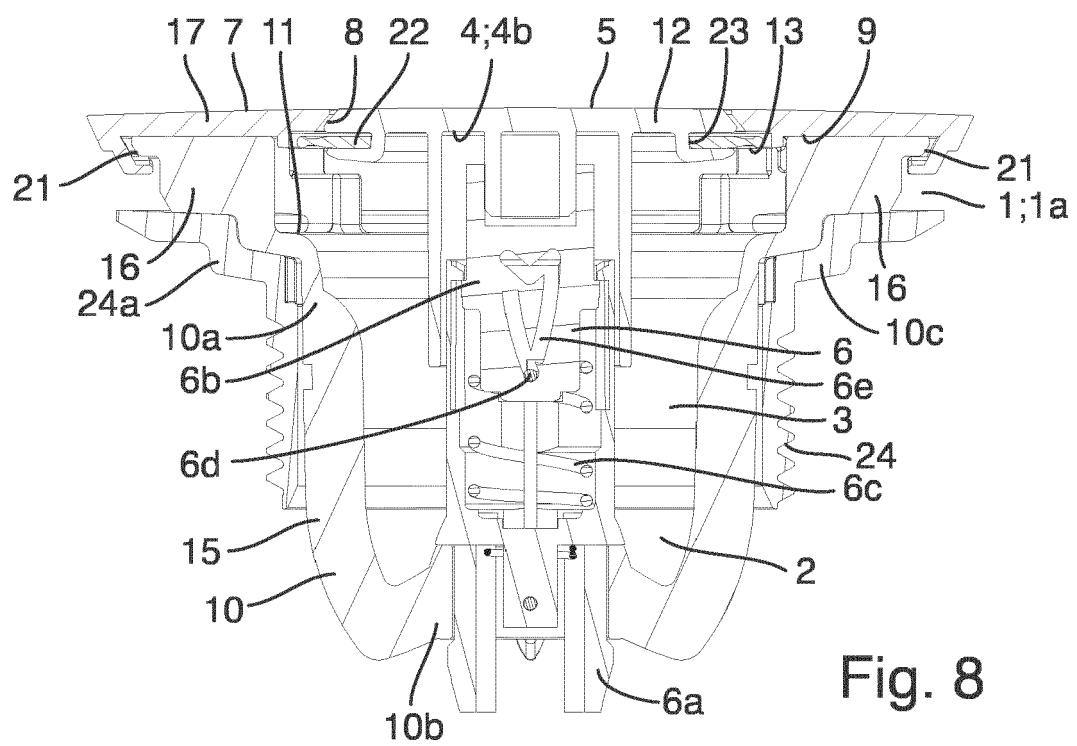
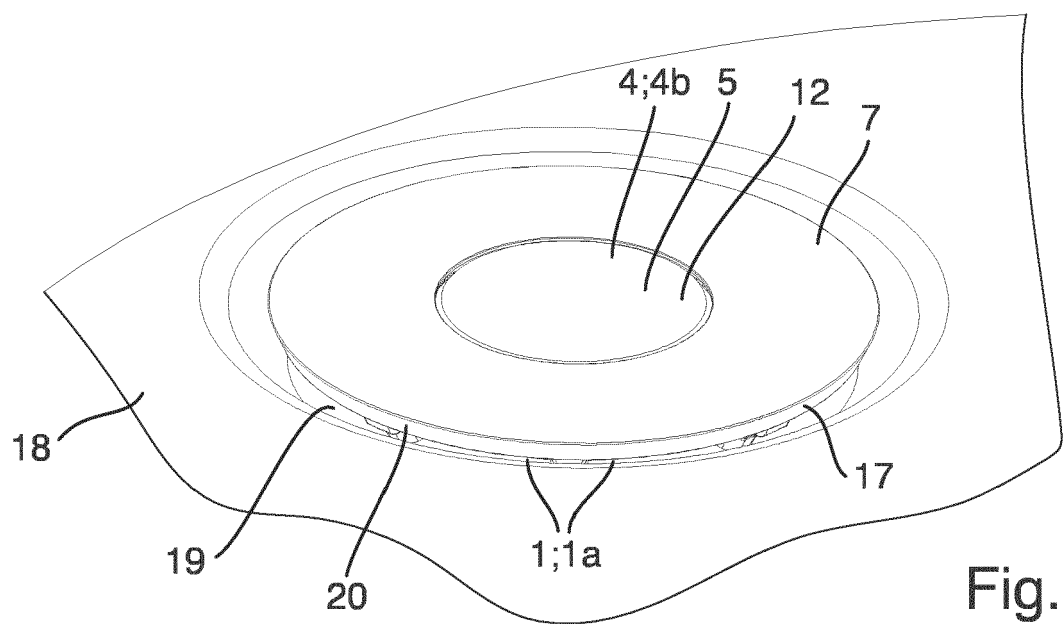


Fig. 2









EUROPEAN SEARCH REPORT

Application Number

EP 24 18 9331

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			E03C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		11 December 2024	Horst, Werner
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