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(54) **Drawer assembly**

(57) The invention relates to a drawer assembly (2, 2', 2") comprising a drawer (4, 4'), which comprises at least one compartment (24,24') for receiving a detergent agent, a housing (26, 26', 26"), which comprises an opening (28) to receive the drawer (4, 4') therein, and a disengageable retaining device to delimit a movement of the drawer (4, 4') with respect to the housing (26, 26', 26"), wherein the retaining device comprises at least one stopping element (32,32',32'') and at least one catching element (16,16') adapted to engage with the at least one stopping element (32,32',32'') , wherein an upper wall element (30) or cover and/or side wall (45) of the housing (26, 26', 26") comprises the at least one stopping element (32,32'32''), and wherein a side wall (8, 8') of the drawer (4, 4') or an intermediate wall (14) of the drawer (4, 4') comprises the at least one catching element (16,16').

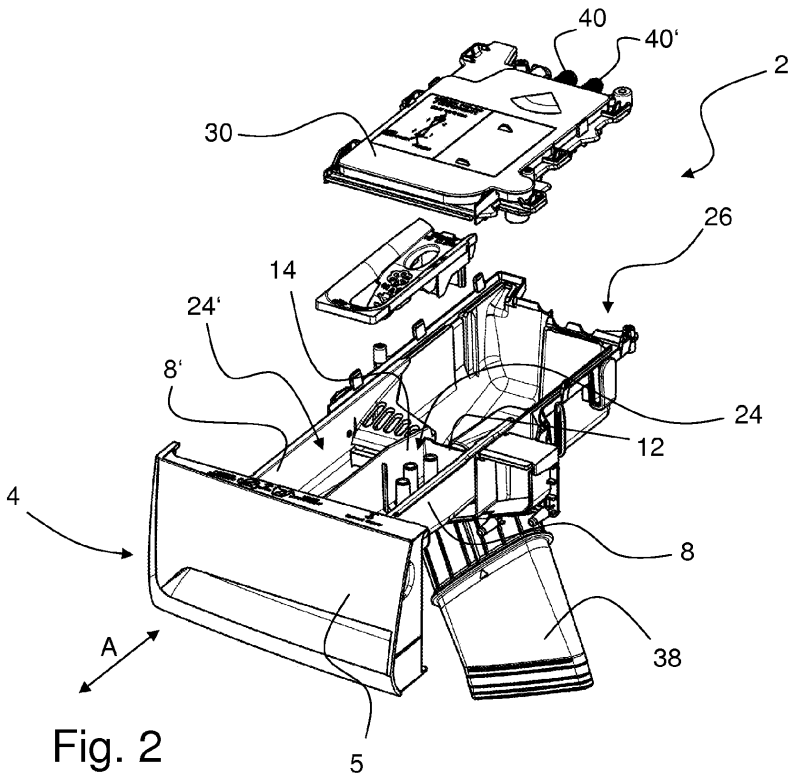

Fig. 2

EP 2 372 011 A1

Description

[0001] The invention relates to a drawer assembly for a washing machine or a washing machine having dryer function, wherein the drawer assembly comprises a retaining device.

[0002] DE 195 05 292 C2 discloses a drawer for a detergent agent. The drawer is received in a housing and is provided with a locking device to prevent accidental removal of the drawer from the housing. A retaining element of the locking device is located at a cover plate of the drawer, which is movable in height and which can be reached by a hand or fingers of an operator. A corresponding stopping element of the locking device is located at a lower side of the top cover of the housing. By pushing the cover plate of the drawer downwards, the retaining element is disengaged from the stopping element and the drawer can be pulled out of the housing.

[0003] It is an object of the invention to provide an improved drawer assembly comprising a retaining device.

[0004] The invention is defined in claim 1. Particular embodiments are set out in the dependent claims.

[0005] According to claim 1, a drawer assembly comprises a drawer, which comprises at least one compartment for receiving a detergent agent, like a washing agent or fabric softener. The drawer is received in an opening of a housing of the assembly. For example the housing can be an integral part of or can be mounted within a washing machine or a washing machine having dryer function, which can be either top-loaded or front-loaded. The assembly further comprises a disengageable retaining device which is adapted to delimit a movement of the drawer with respect to the housing, in particular the retaining device is adapted to set one, two or more prefixed positions of the drawer with respect to the housing. In particular the retaining device provides at least one retaining position for the drawer in the housing. For example the retaining device allows a withdrawal of the drawer, until the drawer reaches a retaining position where the retaining device prevents further withdrawal of the drawer. Thereby it is prevented that the drawer is unintentionally or accidentally completely removed from the housing. The retaining device comprises at least one stopping element and at least one catching element adapted to engage with the at least one stopping element. An upper wall element or cover or a side wall of the housing comprises the at least one stopping element and at least one side wall or at least one intermediate wall of the drawer comprises the at least one catching element. Side walls of the housing are the longitudinal walls of the housing which are parallel to the pull-out or withdrawal direction of the drawer. Side walls of the drawer are the longitudinal outer walls of the drawer which are parallel to the pull-out or withdrawal direction of the drawer. Intermediate walls are parallel to the pull-out direction of the drawer, i.e. they are longitudinal dividing walls in pull-out direction of the drawer, wherein an intermediate wall divides the drawer in at least two compartments. Preferably, but not necessarily, more than one intermediate wall (i.e. partition wall) is provided to divide the drawer into more compartments for receiving different washing agents, like detergent, softener, bleaching products etc. As at least one side wall or intermediate wall of the drawer comprises the at least one catching element, the compartment(s) of the drawer are fully accessible for an operator, i.e. the access is not restricted by the at least one catching element. Thereby the drawer is easier to clean and it is easier for an operator to meter detergent into the compartment (s).

[0006] According to a preferred embodiment at least a portion of the drawer assembly is deformable to overcome or disengage the retaining device. E.g. to remove the drawer from the housing for replacement or cleaning. That means in use the drawer is withdrawn into a retaining position, where the at least one catching element engages with the at least one stopping element. Then at least a portion of the drawer assembly, e.g. the at least one catching element and/or the side wall comprising the catching element, is deformed to overcome or disengage the retaining device, such that the the drawer can be fully extracted from its housing. Deformability, in particular elastic deformability, can be provided by using elastic material like an elastomer for the respective portion(s) of the assembly, e.g. for the catching element and/or stopping element. Alternatively or additionally at least a portion of the side wall where the catching element is arranged, a portion of the at least one intermediate wall where the catching element is arranged and/or a portion of the upper wall element and/or of the side wall where the stopping element is arranged, and/or the stopping element itself is elastically deformable, in particular by forming the respective portion of the assembly of molded plastic or metal which is deformable to overcome the retaining device.

[0007] Preferably, when the drawer assembly is mounted in a washing machine, i.e. the drawer assembly is in its operational position, the at least one catching element and the at least one stopping element are arranged such that the at least one catching element and/or the at least one stopping element is deformed or is moved in a direction which lies in a horizontal or substantially horizontal plane. In other words the at least one catching element or the stopping element moves horizontally to overcome the retaining device or retaining position.

[0008] According to a preferred embodiment, when the drawer assembly is mounted in an operational position in a washing machine or a washing machine comprising a dryer function, the intermediate wall is arranged in a substantially vertical plane.

[0009] Preferably the intermediate wall is formed integrally, i.e. in one-piece, with the drawer, in particular by injection molding. Thereby less individual elements have to be assembled which saves time when assembling the drawer.

[0010] Preferably deforming a deformable portion of the drawer assembly is accomplished by manually de-

forming the portion, e.g. the side wall, intermediate wall or cover. E.g. an operator presses or pushes against a side wall or catching element of the drawer, such that an engaged catching element disengages from the corresponding stopping element and the drawer can be fully extracted. Alternatively or additionally an increased pulling or withdrawal force is applied when the drawer is in the retaining position, such that the deformable portion of the assembly is deformed by the withdrawal or pull-out force, e.g. the catching element, stopping element, side wall and/or cover is deformed thereby. The deformability of at least a portion of the drawer assembly provides two easy and straightforward ways for disengaging the retaining device. Further, as the retaining device is disengaged by deforming a portion of the drawer assembly, like the side wall, the retaining device requires no movable parts, e.g. like levers, hinges or springs. Thereby the drawer assembly or retaining device, respectively, comprises less components, whereby the assembly is easier to produce and more robust in use.

[0011] Preferably the at least one catching element is formed integrally with the side wall or intermediate wall. Alternatively or additionally the at least one stopping element is formed integrally with the cover of the housing. For example by injection molding. Thereby the assembly comprises less individual components, whereby the drawer assembly can be assembled in shorter time. Preferably the upper wall element comprising the at least one stopping element is arranged at a top plate of a washing machine, or a cover plate of a housing which is mounted within a washing machine. According to a preferred embodiment, the upper wall element is part of a water dispensing unit, which is adapted to supply water into compartment(s) of the drawer. Preferably the at least one stopping element is formed together with such a dispensing unit (upper wall element) by injection molding.

[0012] The at least one catching element can be arranged at any of the side wall surfaces, i.e. at an inner surface, an outer surface and/or upper surface of the side wall. In other words, the at least one catching element can be arranged on one of the vertical or substantially vertical side surfaces, i.e. the inner surface which faces a compartment of the drawer or the outer surface which faces outwards with respect to a compartment of the drawer. Additionally or alternatively the at least one catching element is arranged at the (horizontal) upper surface of the side wall, i.e. the surface of the wall which connects the two vertical surfaces. Alternatively or additionally the at least one catching element can be arranged at one or each of the two vertical or substantially vertical side/lateral surfaces of the at least one intermediate wall and/or at the (horizontal) upper surface of the intermediate wall connecting the vertical surfaces. The terms horizontal/vertical refer to a position of side walls and intermediate walls in an operating position of the drawer assembly within a washing machine. In particular, the at least one catching element can extend over an inner surface to an outer surface of a wall or from a vertical side surface of a wall to an upper horizontal surface of the wall. For example, when the catching element is located on an outer surface, i.e. outside the compartment(s), or upper horizontal surface of a side wall, the catching element does not limit the space or volume of a compartment of the drawer.

[0013] Preferably the at least one catching element protrudes from a surface of the at least one side wall or the at least one intermediate wall, alternatively or additionally at least a portion of the at least one catching element is recessed from a surface of the at least one side wall or the at least one intermediate wall, wherein the at least one stopping element comprises a corresponding recessed/protruding feature to catch the or interlock with the protruding catching element. In particular an interlocking feature between the stopping element and catching element can be at least partially triangle-shaped, cylinder-shaped, ball-shaped and/or hemispherical. When an interlocking feature is provided, the retaining device prevents the movement of the drawer in both the withdrawal direction and the inserting (pushing) direction, when the drawer is in the retaining position. I.e. such an interlocking feature secures the drawer in the retaining position also against accidental or unintentional insertion of the drawer, e.g. during metering detergent into a compartment of the drawer.

[0014] Preferably the at least one catching element comprises a catching surface which is adapted to engage with or rest against a stopping surface of the at least one stopping element in pull-out direction of the drawer. In contrast to an interlocking feature, the engagement of the catching surface with the stopping surface of the retaining device prevents a removal of the drawer only in the withdrawal direction of the drawer, wherein the drawer can be pushed from a retaining position back into the housing without resistance from or having to disengage the retaining device. Preferably the catching surface and/or the stopping surface is/are inclined with respect to the pull-out or withdrawal direction of the drawer. Preferably the catching element and the stopping element are correspondingly inclined. An inclination of the catching surface and/or stopping surface with respect to the withdrawal direction of the drawer redirects a pulling force exerted on the drawer in a direction basically perpendicular to the inclined catching and/or stopping surface. Due to the redirected force, a deformable or elastic portion of the drawer, e.g. the catching element, stopping element, side wall or an intermediate wall, is deformed and the retaining device is disengaged. Due to the inclined engaging surfaces, it is easier to overcome the retaining element or force. Further, less force or stress is exerted on the catching element and the stopping element in withdrawal direction, whereby the material is less stressed and a longer service life of the retaining device, i.e. of the assembly, is achieved.

[0015] Preferably the at least one catching element and additionally or alternatively the at least one stopping element comprise a beveled or chamfered portion in form

of a shallow wedge, which is effective in push direction of the drawer. For example, a beveled portion of a catching element forms a shallow wedge or ramp which provides a continuously and slowly increasing surface, e.g. from a side wall of the drawer to an outmost or most protruding point of a protruding catching element. When reinserting the drawer into the housing, e.g. after cleaning the drawer, the beveled portion provides a continuously increasing ramp by which the retaining device can be easily overcome in inserting direction. I.e. the beveled portion facilitates a deformation of a deformable portion of the housing, e.g. a side wall, and facilitates thereby a reinsertion of the drawer into the housing.

[0016] According to a preferred embodiment, the retaining device comprises at least two catching elements and alternatively or additionally at least two stopping elements to provide at least two retaining positions for the drawer in the housing. For example, in a first retaining position the drawer is completely inserted in the housing and in a second retaining position the drawer is partially withdrawn from the housing, wherein an accidental or unintentional (complete) removal of the drawer from the housing is prevented, e.g. when the drawer is pulled-out for metering washing detergent into a compartment of the drawer.

[0017] According to a preferred embodiment the housing comprises two stopping elements adapted to engage with one catching element. Preferably the two stopping elements are spatially offset from each other in the longitudinal direction (pull/push direction A) of the drawer. A first stopping element at a front region (close or proximal to the opening in the housing for receiving the drawer) and a second stopping element in a back or rear region of the housing (distal to the opening in the housing for receiving the drawer), wherein the drawer comprises a catching element at a rear region of a side wall or intermediate wall, i.e. distal to a front panel of the drawer. This embodiment provides two retaining positions. In a first retaining position the catching element is adapted to engage with the first stopping element when the drawer is partially drawn out of the housing into a position where it is possible to pour or meter detergent into a drawer compartment. Thereby an accidental or unintentional removal of the drawer from the housing is prevented. In a second retaining position, the catching element of the drawer is adapted to engage with the second stopping element of the housing when the drawer is completely inserted in the housing. Thereby the drawer is fixed in the closed position, such that a resistance is provided against withdrawing the drawer from the housing. This resistance can be overcome by pulling at the drawer with sufficient force to deform the catching element, second stopping element and or a portion of the drawer/housing where one of these elements is arranged, such that the retaining force or resistance is overcome.

[0018] Alternatively or additionally two catching elements are provided to engage with one stopping element. Preferably the two stopping elements are spatially offset from each other in the longitudinal direction (pull/push direction A) of the drawer. A first catching element is arranged at a rear region of a side wall or intermediate wall of the drawer (distal to a front panel of the drawer) and a second catching element is arranged at a front region of a side wall or intermediate wall of the drawer (proximal to a front panel of the drawer). In a first retaining position, the first catching element is adapted to engage with the (one) stopping element, when the drawer is partially withdrawn from the housing, e.g. to meter detergent into a compartment of the drawer. Thereby accidental or unintentional removal of the drawer from the housing is prevented. In a second retaining position the second catching element is adapted to engage with the (one) stopping element when the drawer is completely inserted in the housing. Thereby the drawer is securely held in the housing, for example during a washing program or a spin cycle. The drawer can be removed from the housing as described above by pulling with sufficient force at the drawer, such that a deformable portion of the drawer assembly is deformed, whereby the resistance, i.e. the retaining force of the retaining device, is overcome.

[0019] Preferably at least two catching elements are arranged at the same side/intermediate wall or at two opposing side walls or at a side wall and an intermediate wall or at each of at least two intermediate walls of the drawer.

[0020] Reference is made in detail to a preferred embodiment of the invention, an example of which is illustrated in the accompanying figures, which show:

Fig. 1	an exterior view of a washing machine with a drawer assembly,
Fig. 2	an exploded view of a drawer assembly according to a first embodiment,
Fig. 3	a perspective top view of a drawer of the drawer assembly of Fig. 2,
Fig. 4	a perspective bottom view into a receiving opening of a housing of the drawer assembly of Fig. 2,
Fig. 5	a perspective view of a detail of the housing of Fig. 4,
Figs. 6a-6c	details of partial cross-sectional top views of the drawer assembly of Fig. 2 before, during and after disengaging a retaining device of the drawer assembly,
Figs. 7a and 7b	a cross-sectional top view of a drawer assembly according to a second embodiment and a detail thereof,
Figs. 8a and 8b	a cross-sectional top view of a drawer

assembly according to third embodiment and a detail thereof, and

Fig. 9 a cross-sectional view of a catching element and stopping element used for the drawer assemblies of Figs. 2, 7 and 8.

[0021] Fig. 1 depicts a detail of a washing machine 42 comprising a drawer assembly 2, wherein a drawer 4 of the assembly 2 is partially pulled out of its housing 26 or casing or drawer receptacle (Fig. 2).

[0022] Fig. 2 shows an exploded view of the drawer assembly 2 of Fig. 1. The drawer 4 is partially withdrawn or pulled-out of the housing 26. The drawer 4 comprises two side walls 8, 8', a back wall 12, a front wall 6 (Fig. 3), a front panel 5 and a longitudinal intermediate or dividing wall 14. The intermediate wall 14 divides the drawer 4 in two compartments 24, 24', each adapted to receive a detergent agent like a softener or washing agent. The housing 26 comprises an upper wall element 30, which is a water dispenser and comprises water inlets 40, 40', which are connectable to a water supply of the washing machine 42 to supply water into the compartments 24, 24'. The housing 26 further comprises a duct 38 to guide water or water mixed with detergent from the drawer assembly 2 into a washing tub, not illustrated, of the washing machine 42. Arrow A depicts the withdrawal and insertion direction of the drawer 4.

[0023] Fig. 3 shows a perspective top view of the drawer 4 of Fig. 1 with the front panel 5 removed. A protrusion 16, which forms a catching element of a retaining device 16, 32 of the drawer assembly 2 is arranged at an inner lateral side of side wall 8.

[0024] Fig. 4 depicts a perspective view of the housing 26 without the drawer 4. The viewing direction is from the front, i.e. into the opening 28 of the housing 26 for the drawer 4, and from below, such that the inner surface of the upper wall element 30 is shown through the opening 28 of the housing 26. The upper wall element 30 comprises a stopping element 32 of the retaining device 16, 32, which is adapted to engage with the protrusion 16 of the drawer 4 to prevent accidental or unintentional removal of the drawer 4 from its housing 26.

[0025] Fig. 5 shows a detail of the housing 26 of Fig. 4 in a perspective view from below. The upper wall element 30 or cover of the housing 26 comprises the stopping element 32. The stopping element 32 comprises a stop portion or stopping surface 34, which engages with a catch portion or catching surface 18 of the protrusion 16 of the drawer 4, when the drawer 4 is in a retaining position (Fig. 6a). The stopping element 32 further comprises a chamfer 36, which facilitates a (re)insertion of the drawer 4 into the housing 26.

[0026] Figs. 6a to 6c show details of a partial cross sectional top views of the drawer assembly 2. The top views of the assembly 2, i.e. of the housing 26 with the drawer 4 therein, are cut in a plane through the stopping element 32. The positions of the drawer 4, stopping element 32, protrusion 16 and side wall 8 are shown before (Fig. 6a), during (Fig. 6b) and after (Fig. 6c) disengaging the retaining device 16, 32 of the drawer assembly 2.

[0027] Fig. 6a depicts the drawer assembly 2 in a retaining position, i.e. in a position where the protrusion 16 engages with the stopping element 32. In particular, a catch portion 18 or surface of the protrusion 16 engages with the stop portion 34 of the stopping element 32. The side wall 8 is elastically deformable in a direction basically perpendicular to the withdrawal direction. I.e. when the side wall 8 is deformed outwards (here: to the right), the protrusion 16, i.e. the catch portion 18, moves in a horizontal plane and disengages from the stopping element 32, i.e. stop portion 34.

[0028] There are two possibilities or methods to overcome or disengage the retaining device. A first method to disengage the retaining device is accomplished by pulling at the drawer 4 in withdrawal direction, such that the side wall 8 is deformed outwards. I.e. the movement of the side wall 8 and therefore of the protrusion 32 lies in a plane which is horizontal or substantially horizontal when the assembly 2 is mounted in a washing machine, i.e. in an operational position of the assembly 2. The pulling force in withdrawal direction is redirected by the inclined surfaces of the chamfer 36 and catch portion 18 in a direction perpendicular to the inclined surfaces, whereby the deformable side wall 8 is deformed outwards by force until the protrusion 16 disengages from the stopping element 32, i.e. until the protrusion 16 is pulled beyond the stopping element 32.

[0029] An alternative method for disengaging the retaining device is provided by pulling the drawer 4 out of the housing 26 until the protrusion 16 engages with the stopping element in a retaining position (Fig. 6a). In this position of the drawer 4 a marked push portion 22 is visible for a user. The user can manually push the side wall 8 outwards, until the protrusion 16 is disengaged from the stopping element 32 (Fig. 6b) and then the user can finally completely pull-out the drawer 4 from its housing 26.

[0030] Fig. 6b shows the drawer assembly 2 in an intermediate step during withdrawal of the drawer 4 from the housing 26. The marked push portion 22 as indicated by the mark is pushed manually outwards and therefore a deformable portion 10 of the elastically deformable side wall 8 is deformed outwardly. Now the drawer 4 can be drawn beyond the retaining position (Fig. 6a), i.e. the drawer 4 with the protrusion 16 can be withdrawn beyond the stopping element 32 as depicted in Fig. 6c. After the stopping element 32 is overcome, the operator can release the force exerted on the marked push portion 22 and the elastically deformable side wall 8 returns into its initial shape (Fig. 6c). Then the drawer 4 can be easily withdrawn from the housing 26, e.g. for replacement or cleaning.

[0031] When reinserting a drawer 4 into the housing 26, the protrusion 16 has to overcome the stopping ele-

ment 32 in reverse direction, i.e. in pushing direction as depicted in Fig. 6c. The protrusion 16 comprises a beveled portion 20, i.e. a shallow wedge, which continuously increases in height up to the most protruding point of the protrusion 16. When inserting the drawer 4 into the opening 28 of the housing 26 into a position as depicted in Fig. 6c, the beveled portion 20 provides that the pushing force is redirected, basically perpendicular to the beveled portion surface, such that the deformable side wall 8 is pushed outwardly. When the most protruding point of the protrusion 16 is passed, the side wall 8 returns into its initial shape, i.e. the retaining device is engaged as depicted in Fig. 6a. During insertion of the drawer 4, the chamfer 36 of the stopping element 32 slides along the beveled portion 20 and reduces thereby the wear on the material and facilitates the insertion of the drawer 4. Alternatively or additionally the drawer 4 can be reinserted into the housing 26 by manually deforming the side wall 8 outwardly as described above during insertion of the drawer 4 and releasing the side wall 8 when the protrusion 16 is beyond the stopping element 32.

[0032] Fig. 7a shows a cross-sectional top view of a second embodiment of a drawer assembly 2' comprising two stopping elements 32, 32'. Elements at least functionally corresponding to elements described above with reference to the first embodiment are marked with the same reference numerals. The assembly 2' of Fig. 7a basically corresponds to the assembly 2 of Fig. 2, wherein the assembly 2' additionally comprises a second stopping element 32' arranged at housing 26'. Fig. 7a shows the assembly 2' with the drawer 4 completely inserted in the housing 26'. The second stopping element 32' is arranged at a rear region of the housing 26' and engages with the protrusion 16 of the drawer 4, such that the drawer 4 is securely held in its closed position within the housing 26'. Fig. 7b shows a detail of the rear region of the assembly 2' where the protrusion 16 is engaged with the stopping element 32' in a retaining position.

[0033] The assembly 2' provides two retaining positions. A first retaining position where the drawer 4 is partially withdrawn from the housing 26' as described above with respect to the first embodiment of the drawer assembly 2. Figs. 7a and 7b show the second retaining position where the drawer 4 is held in a closed position. The first retaining position can be overcome as described above with respect to the first embodiment of assembly 2. The second retaining position, i.e. the closed position, is overcome by pulling at the drawer 4 with an elevated disengagement force such that a deformable portion of the assembly, i.e. the protrusion 16, the second stopping element 32' and/or a portion of the assembly 2' where the elements are arranged, is deformed to overcome the inhibition of the retaining device. Thereby the inclined surfaces of the stopping element 32' and the protrusion 16 facilitate the overcoming of the retaining device, i.e. of the stopping element 32', as described above with respect to the first embodiment.

[0034] Fig. 8a depicts a third embodiment of a drawer assembly 2" in a cross-sectional top view, wherein the drawer 4' is closed, i.e. fully inserted in housing 26". Elements at least functionally corresponding to elements described above with reference to the first or third embodiment are marked with the same reference numerals. In addition to the stopping element 32 and protrusion 16 as shown in Fig. 2 of the first embodiment, the retaining device of the assembly 2" of Fig. 8a comprises a second protrusion 16', which forms a catching element of a retaining device 16', 32', arranged at an opposite side wall 8' of the drawer with respect to the position of the first protrusion 16; advantageously the second protrusion 16' is arranged at the outer surface of the side wall 8' of the drawer 4' (i.e. at the surface of the side wall 8' which faces outwards with respect to the internal of the drawer 4'). Further, the assembly 2" comprises a second stopping element 32", which is adapted to engage with the second protrusion 16' when the drawer 4' is in a closed position. In this case the second stopping element 32' is arranged at the side wall 45 of the housing 26" facing the side wall 8' of the drawer 4' when the drawer 4' is inserted in the housing 26". Fig. 8b shows a detail of the retaining position where the second protrusion 16' is engaged with the second stopping element 32". Thereby the drawer 4' is securely held within the housing 26". The retaining position can be overcome as described above, by pulling by force at the drawer 4' such that a deformable portion of the drawer assembly 2", e.g. the protrusion 16', is deformed, whereby the drawer can be withdrawn beyond the stopping element 32".

[0035] Fig. 9 depicts a cross-sectional view of the catching element 32 and the (first) stopping element 16 used in the above described drawer assemblies 2, 2', 2" to prevent an unintentional removal of the drawer 4, 4' from the housing 26, 26', 26'. The surfaces of the catch portion 18 and the stop portion 34 are inclined at an angle α, γ with respect to the withdrawal direction A of the drawer 4, 4' or side wall 8. The angles α, γ of the catch portion and the stop portion preferably correspond to each other and are preferably in the range of 30° to 50°, preferably the angles are about 40°.

[0036] More preferably the inclined catching surface 18 and/or the inclined stopping surface 34 is/are inclined with respect to the withdrawal direction A of the drawer 4, 4' at an angle α, γ between 30° and 90°, preferably between 35° and 75° and more preferably between 40° and 60°.

[0037] The inclination angle β of the chamfer 36 on the stopping element 32 is measured with respect to the withdrawal direction A and is preferably in the range of 20° to 40°, it is more preferably about 30°. The angle δ of the bevel 20 of the protrusion 16 with respect to the pull-out direction A is preferably in the range of 10° to 15° and thus provides a shallow ramp for overcoming the stopping element 32 during insertion of the drawer 4, 4' into its housing 26, 26', 26", as described above.

Reference Numeral List:

[0038]

2, 2', 2"	drawer assembly
4, 4'	drawer
5	front panel
6	front wall
8, 8'	side wall
10	elastic portion
12	back wall
14	intermediate wall
16, 16'	protrusion, catching element
18	catch portion or catching surface
20	beveled portion
22	marked push portion
24, 24'	compartment
26, 26', 26"	housing / casing / drawer receptacle
28	opening
30	upper wall element / water dispenser
32, 32', 32"	stopping element
34	stop portion or stopping surface
36	chamfer
38	duct
40, 40'	water inlet
42	washing machine
45	side wall of the housing
A	drawer movement direction / pull and push direction
α, β, γ, δ	inclination angle

Claims

1. Drawer assembly (2, 2', 2") comprising:

a drawer (4, 4') comprising at least one compartment (24, 24') for receiving a detergent agent,
a housing (26, 26', 26") comprising an opening (28) adapted to receive the drawer (4, 4') therein, and
a disengageable retaining device adapted to delimit a movement of the drawer (4, 4') with respect to the housing (26, 26', 26"),
wherein the retaining device comprises at least one stopping element (32, 32', 32") and at least one catching element (16, 16') adapted to engage with the at least one stopping element (32, 32', 32"), and
wherein the at least one stopping element (32, 32', 32") is arranged at the housing (26, 26', 26"), in particular at an upper wall element (30) or at a cover or at a side wall (45) of the housing (26, 26', 26"),
characterized in that
the at least one catching element (16, 16') is arranged at a side wall (8, 8') of the drawer (4, 4') or at an intermediate wall (14) of the drawer (4, 4').

2. Drawer assembly according to claim 1, wherein at least one of the following elements are deformable, in particular elastically deformable, to disengage the retaining device:

the at least one catching element (16, 16'),
the at least one stopping element (32, 32', 32"),
at least a portion of the housing where the at least one stopping element (32, 32', 32") is arranged,
at least a portion of the side wall (8, 8') and/or the intermediate wall (14) where the at least one catching element is arranged.

3. Drawer assembly according to claim 1 or 2, wherein the at least one catching element (16, 16') and the at least one stopping element (32, 32', 32") are arranged such that, in operational position of the drawer assembly (2, 2', 2"), the at least one catching element (16, 16') and/or the at least one stopping element (32, 32', 32") is adapted to elastically deflect and/or move in a horizontal or substantially horizontal direction so as to disengage the retaining device.

4. Drawer assembly according to any of the previous claims, wherein the intermediate wall (14) is arranged in a vertical plane or substantially vertical plane, when the drawer assembly (2, 2', 2") is mounted in an operational position.

5. Drawer assembly according to any of the previous claims, wherein the intermediate wall (14) is formed integrally with the drawer (4, 4').

6. Drawer assembly according to any of the previous claims, wherein the at least one catching element (16, 16') is arranged at one of two vertical or substantially vertical side surfaces and/or at a horizontal or substantially horizontal upper surface connecting the at least two side surfaces of the side wall (8, 8') or of the intermediate wall (14).

7. Drawer assembly according to any of the previous claims, wherein the at least one catching element (16, 16') is formed integrally with the side wall (8, 8') or the intermediate wall (14) of the drawer (4, 4')

8. Drawer assembly according to any of the previous claims, wherein the at least one stopping element (32, 32', 32") is formed integrally with the upper wall element (30) or cover or side wall (45) of the housing (26, 26', 26").

9. Drawer assembly according to any of the previous claims, wherein the at least one catching element (16, 16') comprises a catching surface (18) adapted to engage with a stopping surface (34) of the at least one stopping element (32, 32', 32") in withdrawal direction (A) of the drawer (4,, 4'), wherein the catching surface (18) and/or the stopping surface (34) is/are inclined with respect to the withdrawal direction (A) of the drawer (4, 4').

10. Drawer assembly according to any of the previous claims, wherein the at least one catching element (16, 16') and/or the at least one stopping element (32, 32', 32") comprises a beveled or chamfered portion (20, 36) effective in push direction (A) of the drawer (4),

11. Drawer assembly according to claim 10, wherein the beveled or chamfered portion (20) of the at least one catching element (16, 16') is inclined with respect to the push or withdrawal direction (A) of the drawer (4, 4') at an angle (δ) between 5° to 20°, preferably between 10° to 15 ° and/or the beveled or chamfered portion (36) of the at least one stopping element (32, 32', 32") is inclined with respect to the push or withdrawal direction (A) of the drawer (4) at an angle (β) between 10° to 45°, preferably between 10° to 30°.

12. Drawer assembly according to any of the previous claims, wherein the retaining device comprises at least two catching elements (16, 16') and/or at least two stopping elements (32, 32', 32") adapted to provide at least two retaining positions of the drawer (4, 4') in the housing (26, 26', 26").

13. Drawer assembly according to any of the previous claims, wherein the assembly comprises a marked portion (22) indicating a manually deformable portion of the drawer assembly (2, 2', 2"), wherein in particular the mark (22) is arranged at or close to an elastically deformable portion of the side wall (8, 8') or the intermediate wall (14) where the at least one catching element (16, 16') is arranged.

14. Drawer assembly according to any of the previous claims, wherein the upper wall element (30) is a water dispenser adapted to feed water into the drawer (4, 4'), wherein in particular the upper wall element is a bottom portion of a water dispenser.

15. Household appliance, in particular a washing machine or a washing machine having dryer function, comprising a drawer assembly (2, 2', 2") according to any of the previous claims.

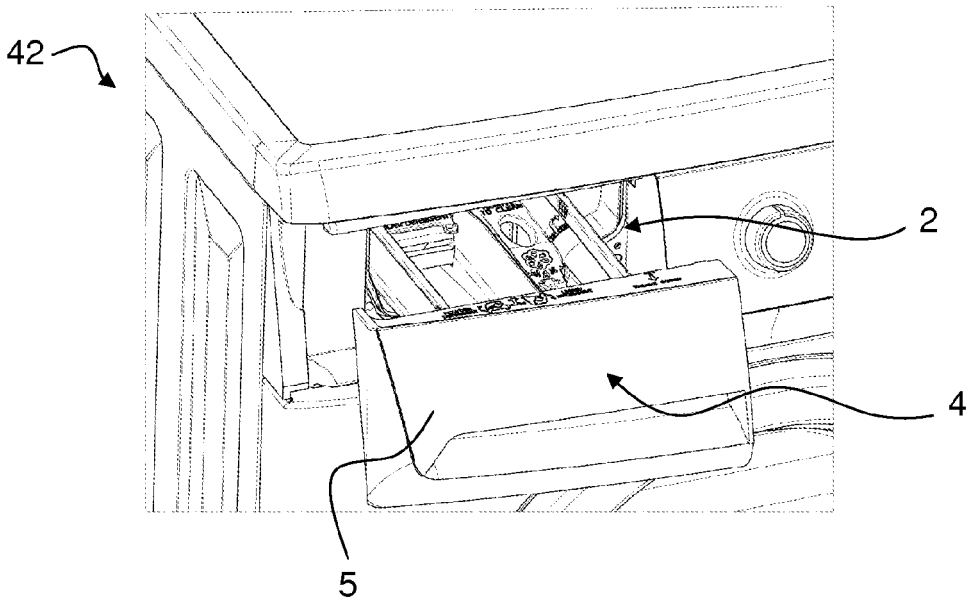

Fig. 1

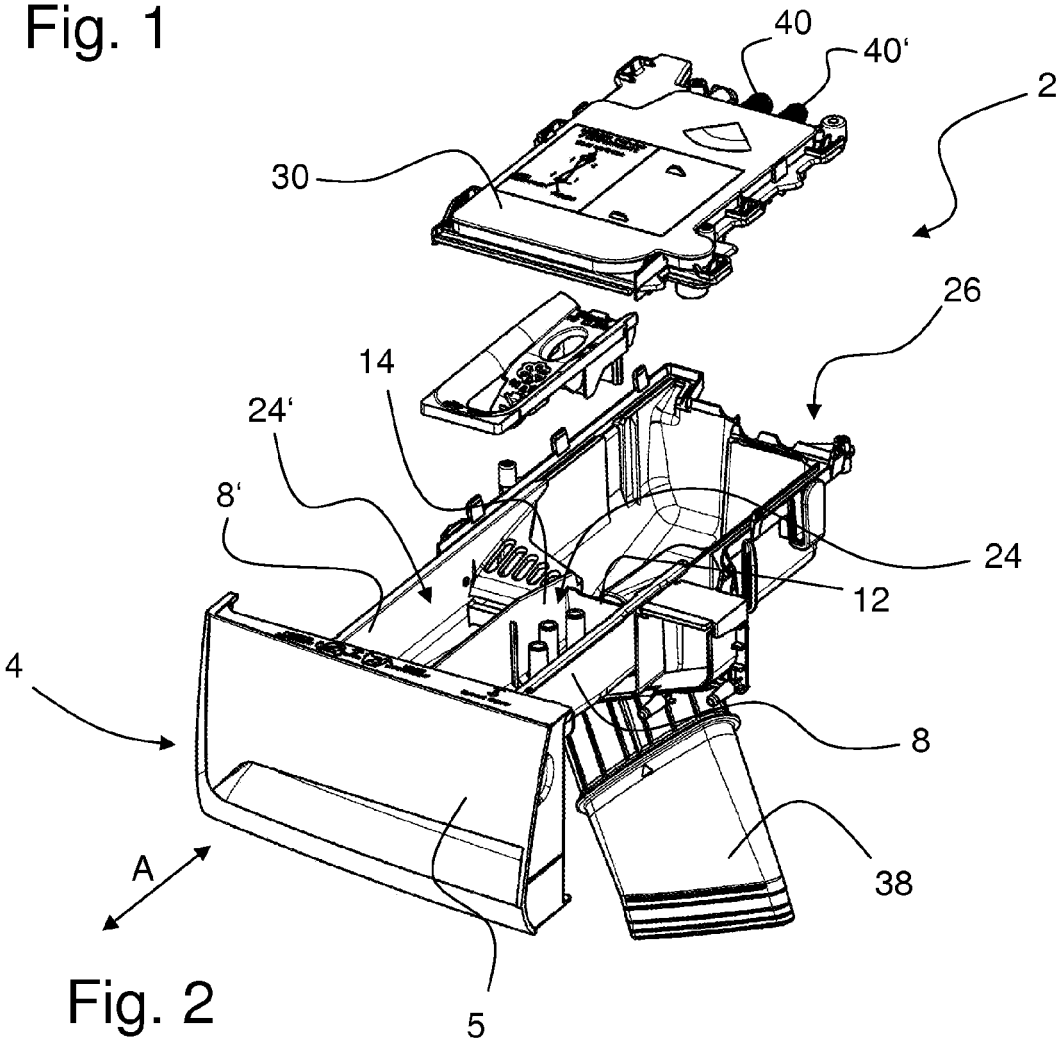

Fig. 2

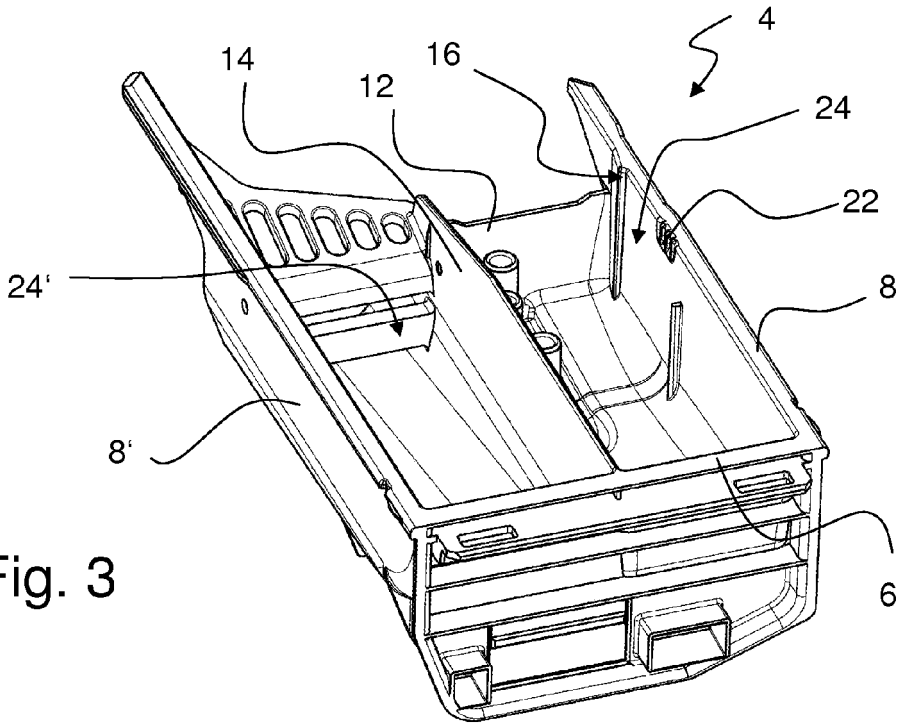

Fig. 3

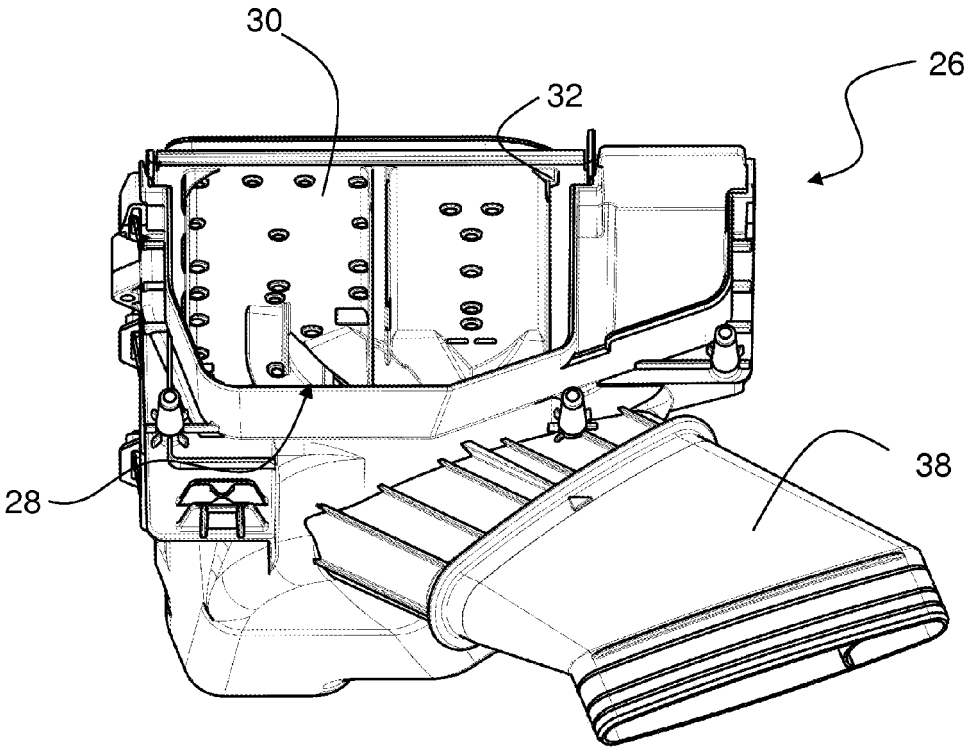

Fig. 4

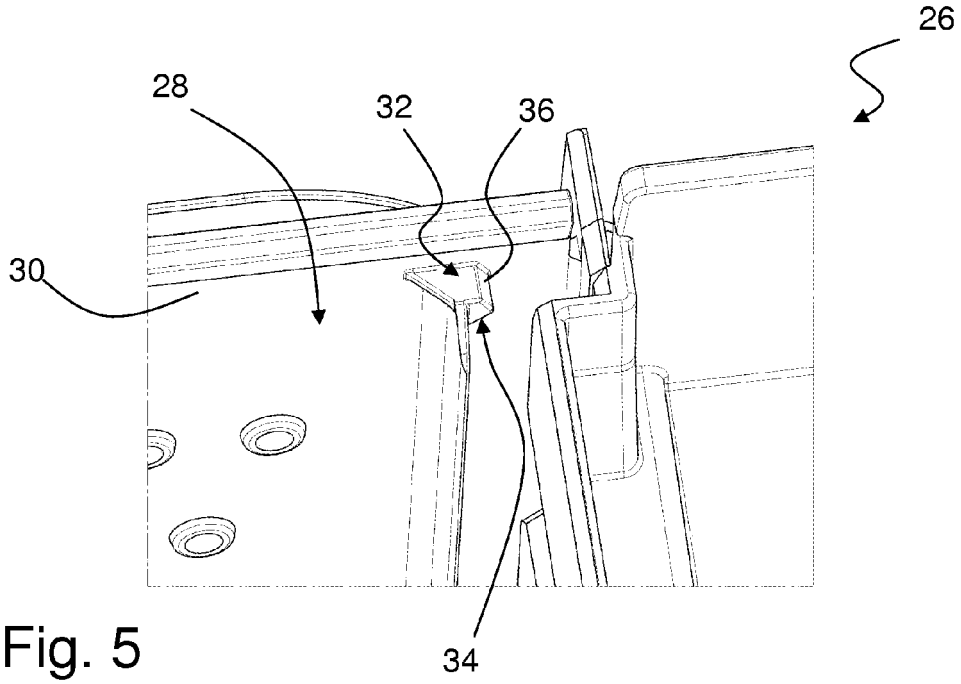

Fig. 5

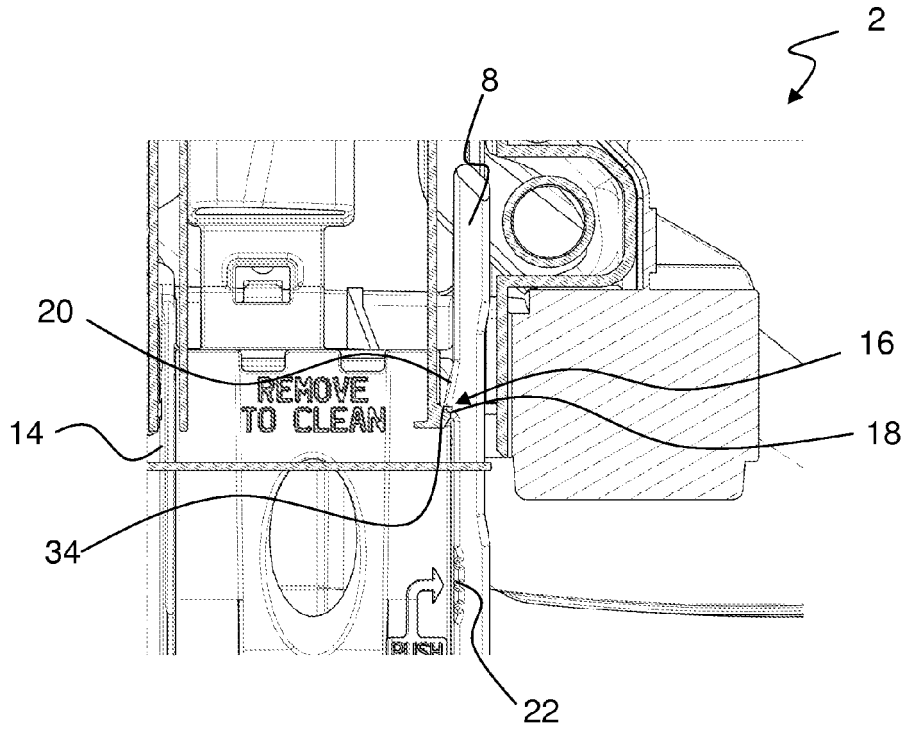

Fig. 6a

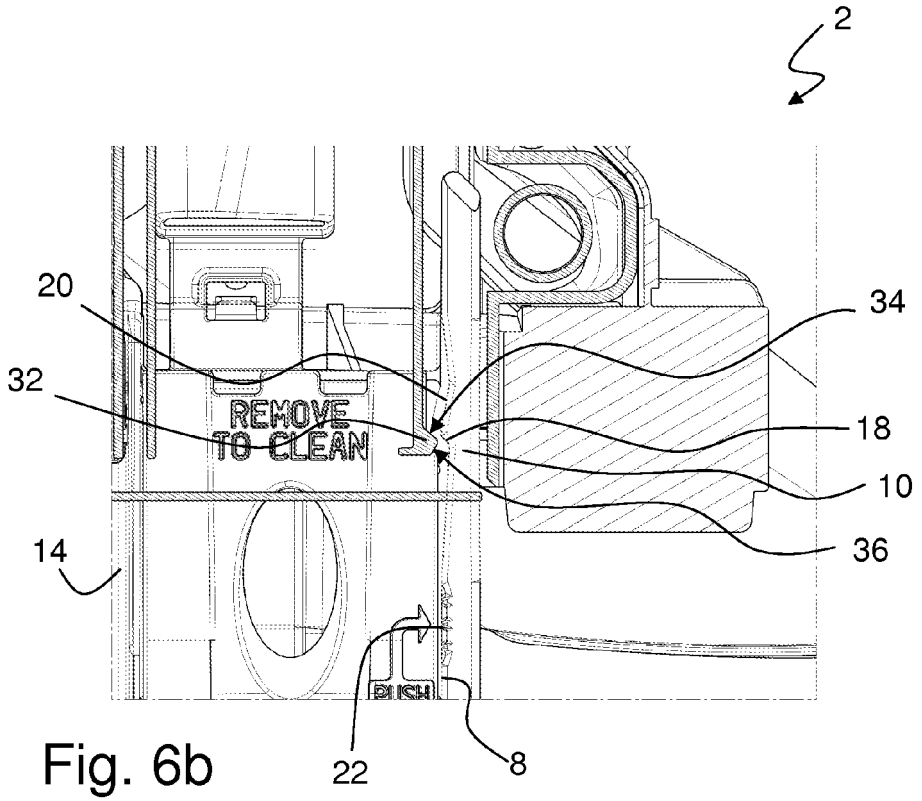
2
20
32
34
REMOVE
TO CLEAN
18
10
36
14
PUSH
22
8

Fig. 6b

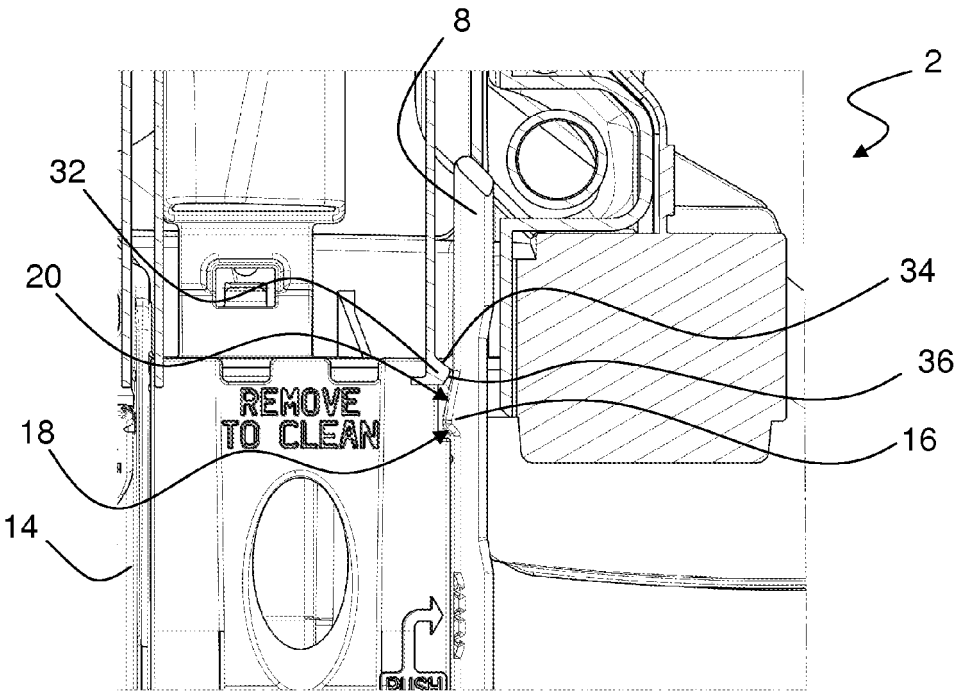
8
2
32
20
34
36
REMOVE
TO CLEAN
18
16
14
PUSH

Fig. 6c

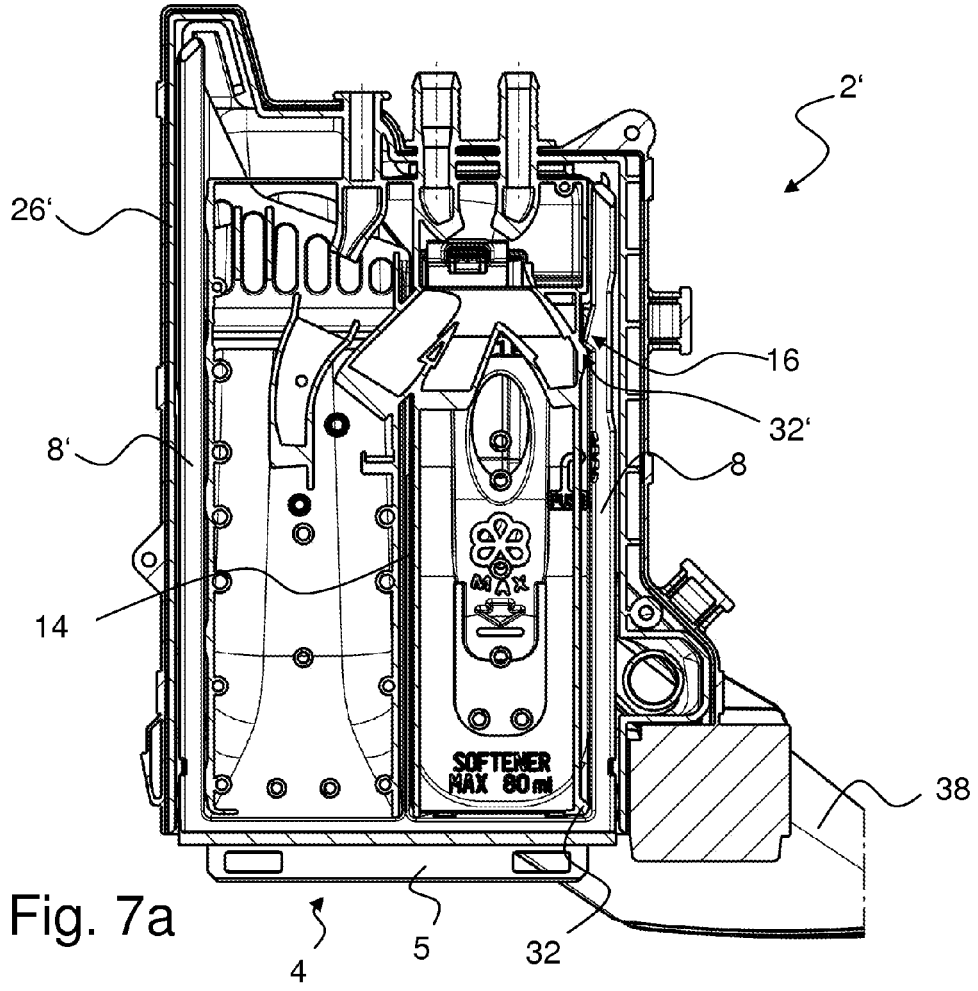

Fig. 7a

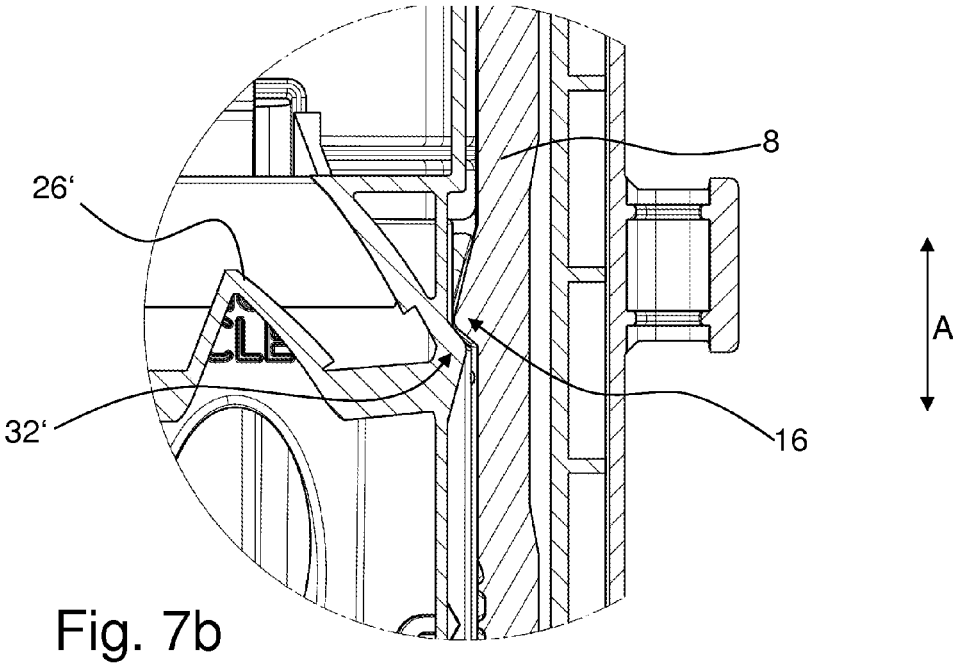

Fig. 7b

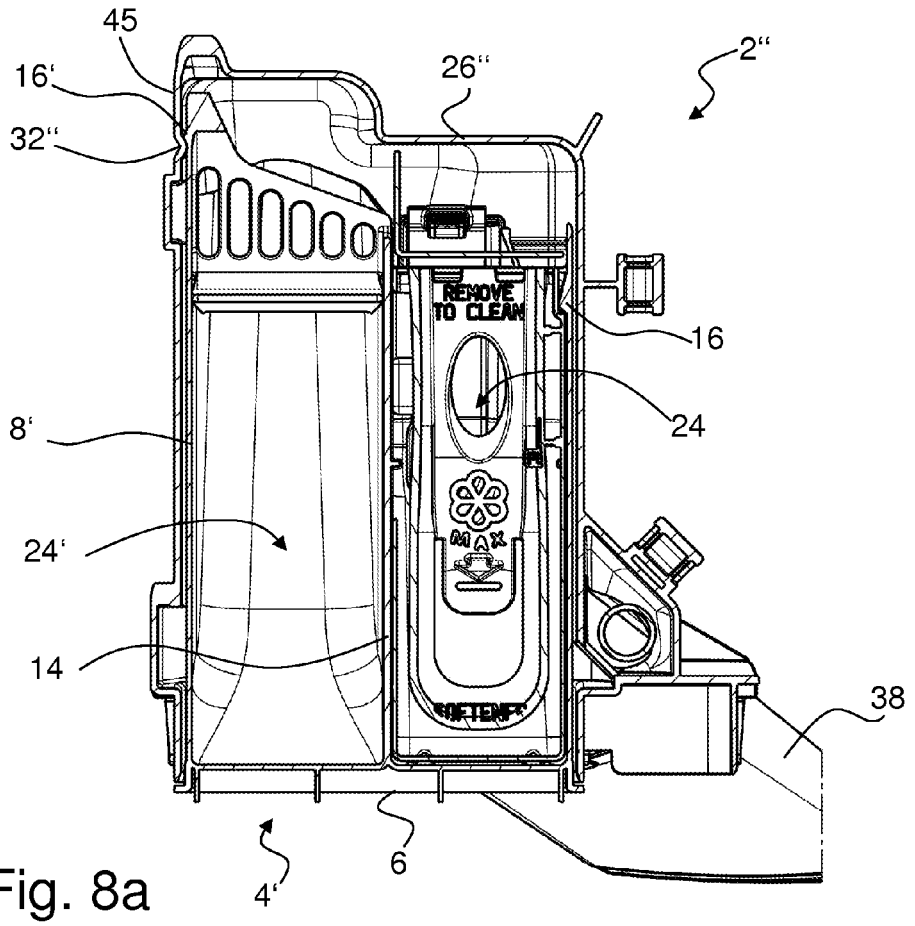

Fig. 8a

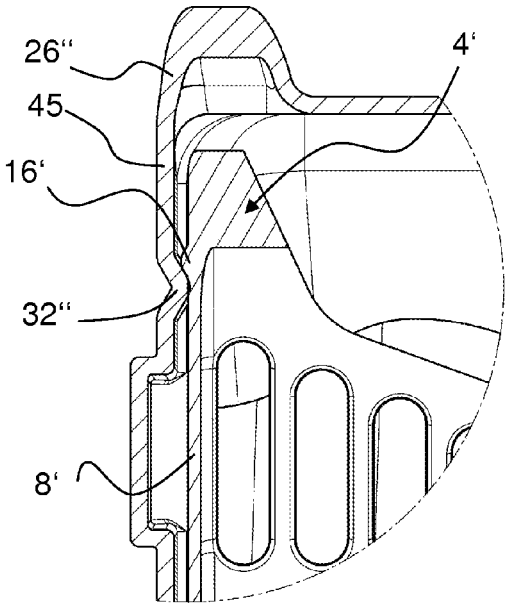

Fig. 8b

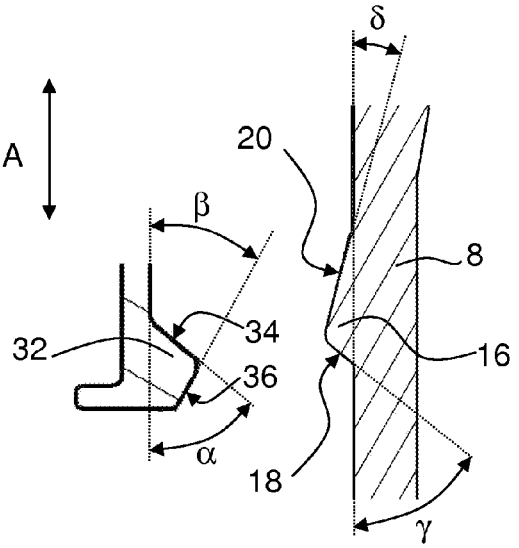

Fig. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 10 15 8602

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	EP 2 003 237 A1 (ELECTROLUX HOME PROD CORP [BE]) 17 December 2008 (2008-12-17) * paragraphs [0001], [0002], [0008] - [0022]; figures 1-3,4,5 * -----	1-3, 6-12,15 4,5,13, 14	INV. D06F39/02
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A	US 2006/162392 A1 (KWON HO C [KR] ET AL KWON HO CHEOL [KR] ET AL) 27 July 2006 (2006-07-27) * paragraphs [0003], [0029] - [0041]; figures 1-3 * -----	1-15	
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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
Munich	16 September 2010	Clivio, Eugenio

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16-09-2010

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