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(54) **Laundry treatment device with door assembly**

(57) The invention relates to a laundry treatment device (2) comprising a laundry treatment chamber (3), a machine housing (4) enclosing the laundry treatment chamber (3) and having a laundry loading opening (5) for loading/unloading the laundry treatment chamber (3) with laundry, and a door assembly (6) supported at the machine housing (4) for closing/opening the laundry opening (5), wherein the door assembly (6) comprises a first and a second component (8, 10) attachable or attached to each other by at least one snap-fit connector, and wherein the at least one snap-fit connector comprises at least one first engaging element (18a-r, 18') arranged at the first component (8/10) of the door assembly

(6), and at least one second engaging element (20a-r, 20', 20'') arranged at the second component (10/8) of the door assembly (6), wherein the at least one second engaging element (20a-r, 20', 20'') is adapted to engage with the at least one first engaging element (18a-r, 18') to attach the first component (8/10) to the second component (10/8); the snap-fit connector further comprises at least one forcing element (22a-r, 22') for forcing the at least one first engaging element (18a-r, 18') in engagement with the at least one second engaging element (20a-r, 20', 20''), and/or for forcing the at least one second engaging element (20a-r, 20', 20'') in engagement with the at least one first engaging element (18a-r, 18').

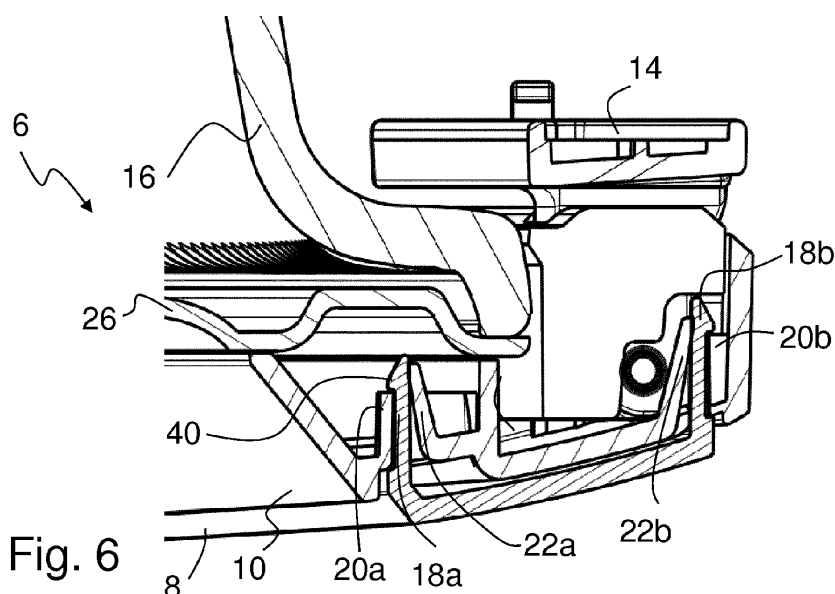


Fig. 6

Description

[0001] The invention relates to a laundry treatment device, in particular it relates to a washing machine, a dryer or a washing machine having a dryer function (also called washer/dryer), comprising a door assembly.

[0002] DE 10 2006 030 024 A1 discloses a door assembly for a washing machine, which is rotatable mounted at a washing machine housing for closing and opening a laundry loading opening of the machine. The door assembly comprises a door deco connected to an outer surface of a front frame, a door cover, a door glass and a rear frame facing the washing machine housing. When the elements of the door assembly are connected to each other the door deco is provisionally attached to the front frame by means of engaging elements of the door deco which are adapted to engage with hook holes of the front frame. Screws are inserted through holes in the rear frame and in the front frame and are screwed into the door deco to permanently assemble the door assembly.

[0003] It is an object of the invention to provide a laundry treatment device having a door assembly which can be assembled in an easy and reliable way.

[0004] Another object of the invention is to provide a laundry treatment device having a door assembly which components, once the door is assembled, do not vibrate (or vibrate very few) one with respect to the others, in particular during the usage of the device.

[0005] Applicant has found that by providing a door assembly of a laundry treatment device (e.g. a washing machine, a dryer, a washer-dryer), which door assembly comprises a first and a second component attachable or attached to each other by at least one snap-fit connector comprising at least one first engaging element arranged at the first component, and at least one second engaging element arranged at the second component and adapted to engage with the at least one first engaging element to attach the first component to the second component, and wherein the snap-fit connector further comprises at least one forcing element for forcing (e.g. pushing, pulling, pressing, etc.) the at least one first engaging element in engagement with the at least one second engaging element, and/or for forcing (e.g. pushing, pulling, pressing, etc.) the at least one second engaging element in engagement with the at least one first engaging element, the door assembly can be assembled in an easy and reliable way, and moreover the risk that the first and the second components can vibrate one with respect to the other due to mechanical backlash or play is reduced or nullified.

[0006] Above objects are achieved, in particular, by a laundry treatment device, e.g. a washing machine, a dryer or a washing machine having a dryer function, comprising a laundry treatment chamber (e.g. a laundry drum), a machine housing enclosing the laundry treatment chamber and having a laundry loading opening for loading/unloading the laundry treatment chamber with laundry, and a porthole or door assembly which is sup-

ported (preferably pivotally) at the machine housing for closing/opening the laundry opening. The door assembly comprises at least two components, e.g. a first component and a second component, e.g. a front frame and a rear frame, which are (during mounting) attachable or are (in the assembled state) attached or fixed to each other by means of at least one snap-fit connector. For example a snap-fit connector may comprise a cantilever with a hook assigned to one component and a corresponding recess or seat assigned to the other component which is adapted to engage with the hook. The at least one snap-fit connector comprises at least one first engaging element, e.g. a hook, which is arranged at a first component of the door assembly and at least one second engaging element, e.g. a recess, a ledge or a second hook, which is arranged at a second component of the door assembly. The at least one second engaging element is adapted to engage with the at least one first engaging element to attach the first component to the second component, i.e. to assemble the two components. For example combinable pairs of engaging elements are first hook /second hook, hook / wall protrusion, hook / ledge, hook / recess etc. I.e. the first engaging element or the second engaging element or both engaging elements may be formed as a hook or may comprise a hook or protrusion which is adapted to engage with an engaging structure of the respective other engaging element. The at least one snap-fit connector advantageously comprises at least one forcing element (e.g. pressing element, pushing element, pulling element) arranged for forcing (e.g. pushing, pressing, pulling, etc.) the at least one first engaging element in engagement with the second engaging element. Alternatively, or in addition, at least one forcing element may be arranged for forcing (e.g. pushing, pressing, pulling, etc.) the at least one second engaging element in engagement with the first engaging element. I.e. the forcing element provides that the first(and/or second) engaging element is forced (e.g. pushed or pressed, or pulled, etc.) against the second (and/or first) engaging element and is reliably held in its engaged position at the second(and/or first) engaging element, such that the first and second components are reliably and securely connected to each other.

[0007] Advantageously the at least one snap-fit connector may be the only connecting means necessary to permanently assemble the first and second component, i.e. it may be not necessary to provide additional fixing means like screws (however also one or more screws can be provided for further fixing the first and second component). Thus the at least two components can advantageously be assembled in one step in an easy and time-saving manner by simply snapping the two components together.

[0008] Moreover, since the forcing element forces (i.e. presses, pushes, pulls, etc.) the first(and/or second) engaging element against the second(and/or first) engaging element, a very good mating or engagement of the first and corresponding second engaging element is al-

ways ensured, independently of the mechanical tolerances of these components; this ensures that the first and second components are stably fixed one another, and therefore avoids or limits unpleasant reciprocal vibrations (and therefore noise) of the first and second components during the functioning of the laundry treatment device.

[0009] Preferably, at least one forcing element is arranged at the second component for forcing the at least one first engaging element in engagement with the at least one second engaging element; alternatively, or in addition, at least one forcing element is arranged at the first component for forcing the at least one second engaging element in engagement with the at least one first engaging element.

[0010] According to a further advantageous embodiment, the at least one snap-fit connector comprises at least two forcing elements, wherein a first forcing element is arranged at the second component and is adapted to force (e.g. to push, press, pull, etc.) the first engaging element against the second engaging element as described above, and wherein a second forcing element is arranged at the first component and is adapted to force (e.g. push, press, pull, etc.) the second engaging element against the first engaging element. For example the first engaging element and the second engaging element may be advantageously formed as a cantilever hook, then each cantilever hook is provided with a respective forcing element, such that the hooks - i.e. their protruding portions or noses - are forced (e.g. pushed or pressed) against each other when the first and second component are attached to each other. Thus a strong and reliable snap-fit connection is provided.

[0011] By connecting the first and second components together using the one or more snap-fit connectors, a third or more other components of the door assembly may be mounted or fixed at the first and second components. For example a third door assembly component (e.g. a door hinge plate or element) may be clamped between the first and second component when fixing the snap-fit connector(s).

[0012] Preferably the first component has an outer face which is arranged outside the machine housing when the door assembly is in a closed position, wherein the second component faces the machine housing when the door assembly is in a closed position. For example the first component may advantageously be a front frame and the second component may advantageously be a rear frame of the door assembly. Alternatively the first component may advantageously be a decorative cover ring or a cover plate or panel and the second component is a front frame to which e.g. the cover ring is attached or is attachable.

[0013] In an advantageous embodiment at least one forcing element is arranged at the second component and it arranged in such a way to exert a force (e.g. a pressure, a push, a traction, a pull, etc.) on the corresponding first engaging element when the latter engages with the second engaging element, so as to force (e.g.

push, press, pull, etc.) the first engaging element in engagement with the corresponding second engaging element.

[0014] In a further advantageous embodiment, at least one forcing element is arranged at the first component and it is arranged in such a way to exert a bias force (e.g. a pressure, a traction, etc.) on the corresponding second engaging element when the latter engages with the first engaging element, so as to force (e.g. push, press, pull, etc.) the second engaging element in engagement with the corresponding first engaging element.

[0015] In a preferred embodiment at least one forcing element is arranged at the second component and it is resilient and inclined (or slanted) towards the associated second engaging element, such that this at least one forcing element is elastically deflected when the corresponding first engaging element engages with the second engaging element, in such a way to push the first engaging element in engagement with the corresponding second engaging element.

[0016] In a further advantageous embodiment at least one forcing element is arranged at the first component and it is resilient and inclined (or slanted) towards the associated first engaging element, such that the at least one forcing element is elastically deflected when the corresponding second engaging element engages with the first engaging element in such a way to push the second engaging element in engagement with the corresponding first engaging element.

[0017] In an advantageous embodiment, the forcing element(s) may be for example arranged in such a way when the first and second components are attached to each other, the forcing element(s) is deflected. I.e. due to the restoring force of the deflected forcing element(s) a pushing or pressing force is advantageously provided towards the respective engaging element which secures the engaging element in its engaged position. For example a resilient and inclined cantilever element may be advantageously provided to push the first/second engaging element against its seat. Another example for a forcing element is a spring element which provides after engagement of the snap-fit connector a push force such that the first/second engaging element is pushed against its seat.

[0018] In a further advantageous embodiment, both first and second engaging elements may be resilient and inclined towards the respective other engaging element, such that both engaging elements are deflected from their initial position (i.e. the position before assembly). Thus the restoring force of the first/second engaging element provides an additional reliable fixation of the at least two components.

[0019] Advantageously, in case of one snap-fit connector the first engaging element may be arranged at the first component and the second engaging element together with the forcing element at the second component. Or the arrangement may be advantageously reverted (reversed snap-fit connector) such that the first engaging

element is arranged at the second component and the second engaging element together with the forcing element at the first component. In case of two, three or more (i.e. a plurality of) snap-fit connectors all first engaging elements may be arranged at the first (or second) component and all second engaging elements and forcing elements may be arranged at the second (or first) component. Or in case of a plurality of snap-fit connectors a portion thereof may advantageously have its first engaging elements at the first component and another portion thereof may advantageously have its first engaging elements at the second component, respectively with the second engaging element and the forcing element at the other component.

[0020] For example the door assembly may comprise at least one reversed snap-fit connector having the same components as described above and below, but at the respective other component. I.e. at least one first engaging element is arranged at the second component, wherein the corresponding second engaging element and forcing element is arranged at the first component. Thus each component may comprise one or more engaging elements and one or more second engaging elements and forcing elements.

[0021] According to an advantageous embodiment the door assembly may comprise a plurality of snap-fit connectors which are evenly distributed along a border region of the door assembly. I.e. a uniform or essentially uniform distance is provided between adjacent snap-fit connectors. Thereby the contact pressure provided by the plurality of snap-fit connectors is evenly distributed over a border region of the door assembly.

[0022] Preferably a first plurality of snap-fit connectors are arranged at an outer border or edge of the door assembly and a second plurality of snap-fit connectors are arranged radial spaced apart or radial offset from the first plurality of snap-fit connectors. Thereby the contact pressure of the snap-fit connectors is distributed evenly over a broader region of the door assembly. For example when the first component is or comprises a frame the plurality of snap-fit connectors are distributed along an outer edge and along an inner edge of the frame. Thus a close fit of the frame (first component) to the second component is provided, especially in the border area of the frame.

[0023] In an advantageous embodiment, at least one of a plurality of snap-fit connectors comprises at least one forcing element which has a forcing (e.g. pushing) direction opposed to a forcing (e.g. pushing) direction of forcing elements of the remaining snap-fit connectors. E.g. snap-fit connectors for a frame are arranged at an inner and outer edge of the frame, wherein the forcing (e.g. pushing) direction of the forcing elements is directed towards the respective edge, i.e. forcing elements at an outer edge provide a force (e.g. a pressure, a push) directed radial outwards with respect to the door assembly and forcing elements at an inner edge provide a force (e.g. a pressure, a push) directed radial inwards. Due to this embodiment the corresponding engaging elements

(i.e. the elements arranged on the same component as the at least one forcing element) can be mounted at an outmost position of the first or second component, i.e. as close as possible to an edge thereof, such that the holding force of the snap-fit connector acts on the components as close as possible to an edge (of the first or second component). Thereby it is provided that a border or edge portion of the components is tightly connected to each other.

[0024] According to an advantageous embodiment, the first component is a cover for protecting or decorating the second component. For example a cover ring attached or attachable to a front frame of the door assembly or alternatively a cover panel extending across a frame opening of a front frame.

[0025] Preferably at least one contact surface between corresponding engaging elements is inclined or slanted with respect to a forcing (e.g. pushing, pulling, etc.) direction of the at least one corresponding forcing element or with respect to an inserting direction of the respective engaging element. In particular the at least one first engaging element may advantageously comprise a first contact surface where the first engaging element may be advantageously adapted to contact a second contact surface of a corresponding second engaging element when the first and second components are engaged. Thus either the first or the second contact surface is inclined or both contact surfaces are inclined. E.g. when the corresponding forcing element forces (e.g. pushes, pulls) the first (second) engaging element against the second (first) engaging element, the first (second) engaging element slides or glides along the inclined contact surface (of the first or second engaging element or of both engaging elements), such that the component associated to the first (second) engaging element is pushed or pulled 'deeper' into the other component until it reaches its end position, i.e. until the both components abut against each other. In other words the snap-fit connector provides a variable fixation depth, whereby manufacturing tolerances of the door assembly can be compensated such that it is provided that both components always closely abut against each other.

[0026] Preferably, at least one of the contact surfaces has an inclination angle with respect to an insertion direction of the at least one engaging element of at least 30°, 40°, 45°, 50° or 60°. The smaller the inclination angle the larger the range of the variable fixation depth and vice versa. I.e. by means of the inclination angle the snap-fit connector can be adapted to mechanical or production tolerances of the door assembly, such that at all times a tight fit of the assembled components is provided.

[0027] In an advantageous embodiment, the first and second engaging element(s) and the forcing element(s) may be made in a single-piece-construction (or single-body), with the respective first or second component of the door assembly; for example the first and second components may be obtained by injection molding of a plastic material, in which case the first and second engaging

element(s) and forcing element(s) may advantageously be obtained in a single-body with the respective first or second component during the injection molding process of the latter.

[0028] Reference is made in detail to preferred embodiments of the invention, examples of which are illustrated in the accompanying figures, which show:

- Fig. 1a a front view of a laundry treatment device having a door assembly according to the invention,
- Fig. 1b a front view of the laundry treatment device of Fig. 1a with the door assembly in an opened state,
- Fig. 2 a front view of the door assembly of Fig. 1,
- Fig. 3 a sectional top view of the door assembly of Fig. 1 before assembly,
- Fig. 4 a sectional top view of the door assembly of Fig. 1 after assembly,
- Fig. 5 a detail of Fig. 3,
- Fig. 6 a detail of Fig. 4,
- Fig. 7 a perspective side view of two components of the door assembly of Fig. 1 before assembly,
- Figs. 8a-b details of Fig. 7, and
- Figs. 9a-b schematic side views of snap-fit connectors for a door assembly of Fig. 1 according to alternative embodiments.

[0029] Fig. 1a shows a front view of a laundry treatment device 2 having a door assembly 6 in a closed state and Fig. 1b shows the treatment device 2 with the door assembly 6 in an open state. The treatment device 2 comprises a machine housing 4, a laundry treatment chamber, in this case a laundry drum 3 within the housing 4 and a laundry loading opening 3 through which the drum 3 is loaded/unloaded with laundry. The door assembly 6 is adapted to close the laundry loading opening 5 of the treatment device 2 and is advantageously pivotally mounted and thus supported at the machine housing 4 of the device 2, and can be opened, preferably, by a handle 12 attached to the door assembly 6.

[0030] Figs. 3 and 4 show sectional top views of the door assembly along the line A-A shown in Fig. 2 which is a front view of the door assembly 6. Figs. 5 and 6 depict magnified details of Figs. 3 and 4. Thereof Figs. 3 and 5 show the door assembly 6 before being assembled while Figs. 4 and 6 show it in the assembled state.

[0031] The door assembly 6 advantageously comprises

a cover ring 8, a front frame 10, a door cover 26, a glass 16 and a rear frame 14. The cover ring 8 advantageously comprises a plurality of hook or snap-fit connectors to attach the cover ring 8 to the front frame 10. Each of the snap-fit connectors advantageously comprises an engaging hook 18a-r (first engaging element), a seat 20a-b (second engaging element) for the hook 18a-r and a forcing element 22a-b for forcing (e.g. pushing, pressing, pulling, etc.) the hook 18a-r against its seat 20a-b when the snap-fit connector is engaged (Figs. 4, 6).

[0032] A plurality of engaging hooks 18a-r (Fig. 7) is evenly distributed along an inner edge 28 and an outer edge 30 of the cover ring 8. The front frame 10 comprises correspondingly arranged hook receptacles which comprise seats 20a-b and forcing elements 22a-b for the respective hooks 18a-r.

[0033] When the cover ring 8 is attached to the front frame 10 the hooks 18a-r are inserted into their associated receptacle or recess where the seats 20a-b are arranged. The insertion process is continued until each hook 18a-r engages with its seat 20a-b, i.e. until a protruding nose or rim 40 of each hook 18a-r reaches and passes a ledge 32 (compare Fig. 9a) of the seat 20a-b and snaps or slides into its engaged position (Figs. 4, 6). As shown in Fig. 5 the forcing elements 22a-b are advantageously inclined or slanted towards the corresponding seat 20a-b. Preferably and in relation to the receptacle or recess, the seats are arranged at one side of the insertion opening or recess for the hook and the respective forcing element is arranged at an opposing side. By inserting the hook 18a-r into the recess between the corresponding seat 20a-b and forcing element 22a-b the forcing element 22a-b is elastically or resiliently deflected (away from the corresponding seat 20a-b). Thus when the hooks 18a-r engage with their respective seat 20a-b, i.e. when the protruding portion or hook nose of the hook 18a-r engages with the ledge of the seat 20a-b, the restoring force of the deflected forcing element 22a-b provides a pressure force against the hook 18a-r, such that the hook 18a-r is reliably pushed or pressed against its seat 20a-b. In Figs. 3 and 6 the snap-fit connectors are shown in their engaged position after assembly of the door assembly 6. I.e. after complete insertion of the hooks into the receptacles or recesses.

[0034] Fig. 7 shows a perspective side view of the cover ring 8 and the front frame 10 before assembly and Figs. 8a-b show details of Fig. 7. The engaging hooks 18a-r are advantageously distributed over the entire circumference of the cover ring 8, more advantageously over the entire inner and outer edge 28, 30 of the cover ring 8. Thus the holding force of the snap-fit connectors is evenly distributed over the cover ring 8 such that after assembly the cover ring 8 sits tightly on the front frame 10.

[0035] In Figs. 8a-b it is shown that the hooks 18a-r which are arranged at the outer edge 30 of the cover ring 8 face radial outwards and the hooks 18a-r arranged at the inner edge 28 of the cover ring 8 face in the opposite direction, i.e. radial inward. Thus the corresponding forcing

ing elements 22a-r provide correspondingly opposed pushing force, i.e. a pushing force directed radial outward for the snap-fit connectors at the outer edge 30 and a pushing force directed radial inward for snap-fit connectors at the inner edge 28. Consequently the engaging hooks 18a-r can be arranged at the cover ring 8 close to the inner and outer edge 28, 30. I.e. the holding force of the snap-fit connectors acts at the outermost edge of the cover ring 8, such that the cover ring 8 closely abuts against the front frame 10, in particular at the inner and outer edge 28, 30 or border region of the cover ring 8.

[0036] Fig. 9a-b show schematic side views of snap-fit connectors according to alternative advantageous embodiments. Unless otherwise mentioned the below described elements of the snap-fit connectors correspond to the above described elements and their respective functions. In particular the snap-fit connector may be a reverse snap fit connector with respect to the cover ring 8 and front frame 10 as described above. For clarity in the following reference is made to a (non-reverse) snap-fit connector.

[0037] As shown in Fig. 9a an engaging hook 18' advantageously comprises a contact area or surface 24' which is inclined with respect to the inserting direction I of the hook 18' or with respect to the push or pressure force direction P of a forcing element 22'. I.e. when the hook 18' is inserted to engage with its seat 20', the seat 20' or the ledge 32 of the seat 20' abuts against the inclined contact surface 24' of the hook 18'. Due to the pushing force P of the forcing element 22' the inclined contact surface 24' slides along the ledge 32, whereby the hook 18' (and therefore the associated cover ring 8) is pulled in inserting direction I closer to the front frame 10 (which is associated to the seat 20' and forcing element 22'). Thus the snap-fit connector compensates production tolerances of the door assembly 6 by providing a variable depth or length fixation means.

[0038] The snap-fit connector shown in Fig. 9b differs from the snap-fit connector of Fig 9a in that a seat 20" is advantageously provided which additionally comprises an inclined contact surface 24" which abuts against the contact surface 24' of the hook 18' in its assembled state. As described above the pushing force P of the forcing element 22' provides that the contact surfaces 24', 24" smoothly glide or slide along each other, whereby the hook 18' and therefore the cover ring 8 is pulled towards the front frame 10 until it closely abuts against the frame 10.

Claims

1. Laundry treatment device (2) comprising a laundry treatment chamber (3), a machine housing (4) enclosing said laundry treatment chamber (3) and having a laundry loading opening (5) for loading/unloading said laundry treatment chamber (3) with laundry, and

a door assembly (6) supported at the machine housing (4) for closing/opening the laundry opening (5), wherein the door assembly (6) comprises a first and a second component (8, 10) attachable or attached to each other by at least one snap-fit connector, and wherein the at least one snap-fit connector comprises

at least one first engaging element (18a-r, 18') arranged at the first component (8/10) of the door assembly (6), and

at least one second engaging element (20a-r, 20', 20") arranged at the second component (10/8) of the door assembly (6), wherein said at least one second engaging element (20a-r, 20', 20") is adapted to engage with said at least one first engaging element (18a-r, 18') to attach said first component (8/10) to said second component (10/8),

characterized in that

said snap-fit connector further comprises at least one forcing element (22a-r, 22') for forcing said at least one first engaging element (18a-r, 18') in engagement with said at least one second engaging element (20a-r, 20', 20"), and/or for forcing said at least one second engaging element (20a-r, 20', 20") in engagement with said at least one first engaging element (18a-r, 18').

2. Laundry treatment device according to claim 1, wherein said at least one forcing element (22a-r, 22') is arranged at said second component (10/8) for forcing said at least one first engaging element (18a-r, 18') in engagement with said at least one second engaging element (20a-r, 20', 20"), and/or at said first component (8/10) for forcing said at least one second engaging element (20a-r, 20', 20") in engagement with said at least one first engaging element (18a-r, 18').
3. Laundry treatment device according to claim 1 or 2, wherein at least one forcing element (22a-r, 22') is arranged at the second component (10/8) and it arranged in such a way to exert a force on the corresponding first engaging element (18a-r, 18') when the latter engages with the second engaging element (20a-r, 20', 20"), so as to force said first engaging element (18a-r, 18') in engagement with the corresponding second engaging element (20a-r, 20', 20"), and/or wherein at least one forcing element (22a-r, 22') is arranged at the first component (8/10) and it is arranged in such a way to exert a force on the corresponding second engaging element (20a-r, 20', 20") when the latter engages with the first engaging element (18a-r, 18'), so as to force said second engaging element (20a-r, 20', 20") in engagement with the corresponding first engaging element (18a-r, 18').

4. Laundry treatment device according to claim 1 or 2 or 3,
 wherein at least one forcing element (22a-r, 22') is arranged at the second component (10/8) and it is resilient and inclined towards the associated second engaging element (20a-r, 20', 20''), such that said at least one forcing element (22a-r, 22') is elastically deflected when the corresponding first engaging element (18a-r, 18') engages with the second engaging element (20a-r, 20', 20''), in such a way to push said first engaging element (18a-r, 18') in engagement with the corresponding second engaging element (20a-r, 20', 20''), and/or
 wherein at least one forcing element (22a-r, 22') is arranged at the first component (8/10) and it is resilient and inclined towards the associated first engaging element (18a-r, 18'), such that said at least one forcing element (22a-r, 22') is elastically deflected when the corresponding second engaging element (20a-r, 20', 20'') engages with the first engaging element (18a-r, 18') in such a way to push said second engaging element (20a-r, 20', 20'') in engagement with the corresponding first engaging element (18a-r, 18').
5. Laundry treatment device according to claim 1, 2, 3 or 4, wherein the at least one snap-fit connector comprises at least two forcing elements,
 wherein a first forcing element is arranged at the second component (10/8) for forcing the at least one first engaging element (18a-r, 18') in engagement with the at least one second engaging element (20a-r, 20', 20''), and
 wherein a second forcing element is arranged at the first component (8/10) for forcing the at least one second engaging element (20a-r, 20', 20'') in engagement with the at least one first engaging element (18a-r, 18').
6. Laundry treatment device according to any of the previous claims,
 wherein the door assembly (6) comprises a plurality of snap-fit connectors, and wherein the plurality of snap-fit connectors are evenly distributed along a border region of the door assembly, and/or
 wherein a uniform distance is provided between adjacent snap-fit connectors.
7. Laundry treatment device according to any of the previous claims, wherein a first plurality of snap-fit connectors are arranged at an outer border (30) of the door assembly and a second plurality of snap-fit connectors are arranged radial spaced apart from the first plurality of snap-fit connectors.
8. Laundry treatment device according to any of the previous claims, wherein at least one snap-fit connector comprises a forcing element (22a-r, 22') having a forcing direction directed radial outwards with respect to the center of the door assembly (6).
9. Laundry treatment device according to any of the previous claims,
 wherein the first or second component (10) comprises a frame (10), and
 wherein a plurality of snap-fit connectors are distributed along an outer edge (30) and an inner edge (28) of the frame (10).
10. Laundry treatment device according to any of the previous claims, wherein the at least one forcing element of the at least one snap fit-connector is arranged such that a force of the at least one forcing element (22a-r, 22') is directed towards a border or edge (28, 30) of the door assembly (6).
11. Laundry treatment device according to any of the previous claims, wherein the first component (8) is a cover element (8) for protecting or decorating the second component (10).
12. Laundry treatment device according to any of the previous claims, wherein the door assembly (6) comprises a glass porthole window (16) which is arranged
 on and fixed to the rear side of the first component (8), or
 at and fixed to the rear side of the second component (10).
13. Laundry treatment device according to any of the previous claims, wherein in a disassembled state or a pre-assembled state of the first and second component (8, 10) the minimum spacing between each engaging element and its associated forcing element is less than the minimum spacing between the engaging element and its associated forcing element after insertion of the corresponding engaging element.
14. Laundry treatment device according to any of the previous claims,
 wherein at least one first engaging element (18') of the snap-fit connector comprises a first contact surface (24'), and wherein the at least one first engaging element (18') is adapted to contact a second contact surface (24'') of a corresponding second engaging element (20') when the first and second component (8, 10) are attached to each other,
 wherein the first contact surface (24') is inclined with respect to a forcing direction (P) of the at least one forcing element (22'), or
 wherein the first contact surface (24') is inclined with respect to an inserting direction (I) of the at least one engaging element (18').

15. Laundry treatment device according to claim 14,
wherein the second contact surface (24") is inclined
with respect to a forcing direction (P) of the at least
one forcing element, or
wherein the second contact surface (24") is inclined 5
with respect to an inserting direction (I) of the at least
one engaging element (18').

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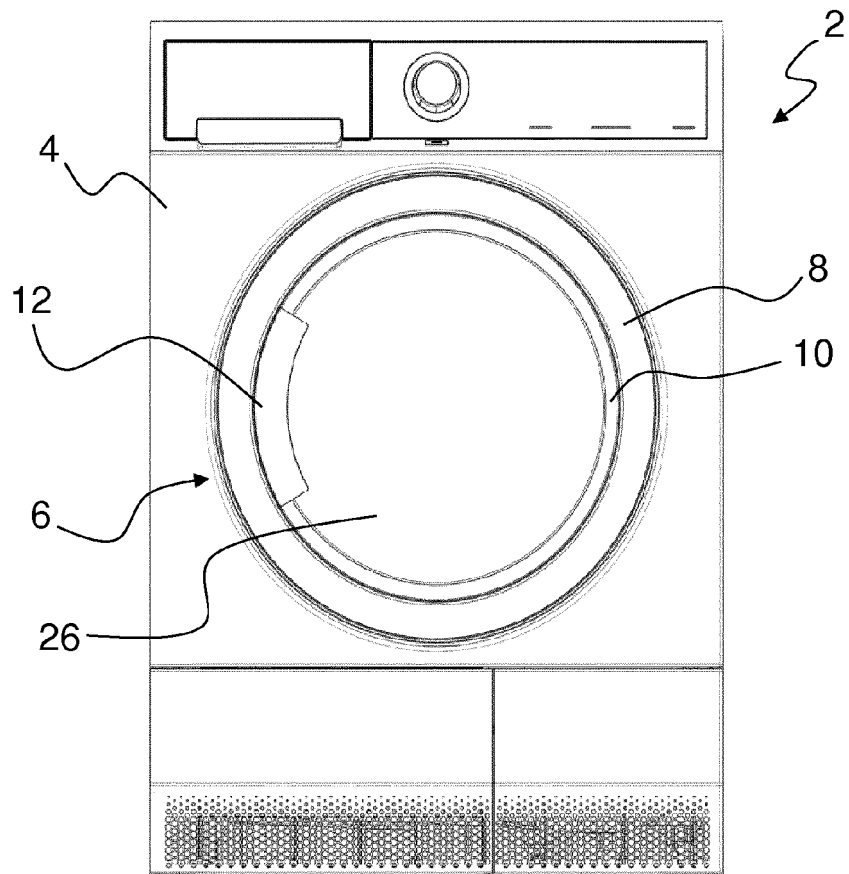


Fig. 1a

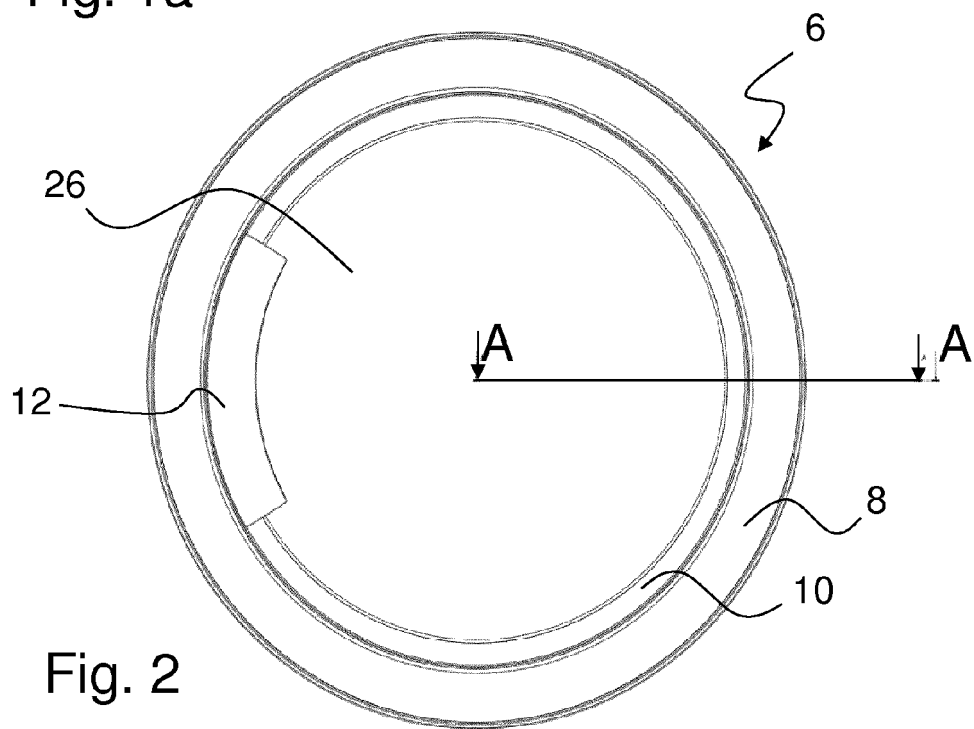


Fig. 2

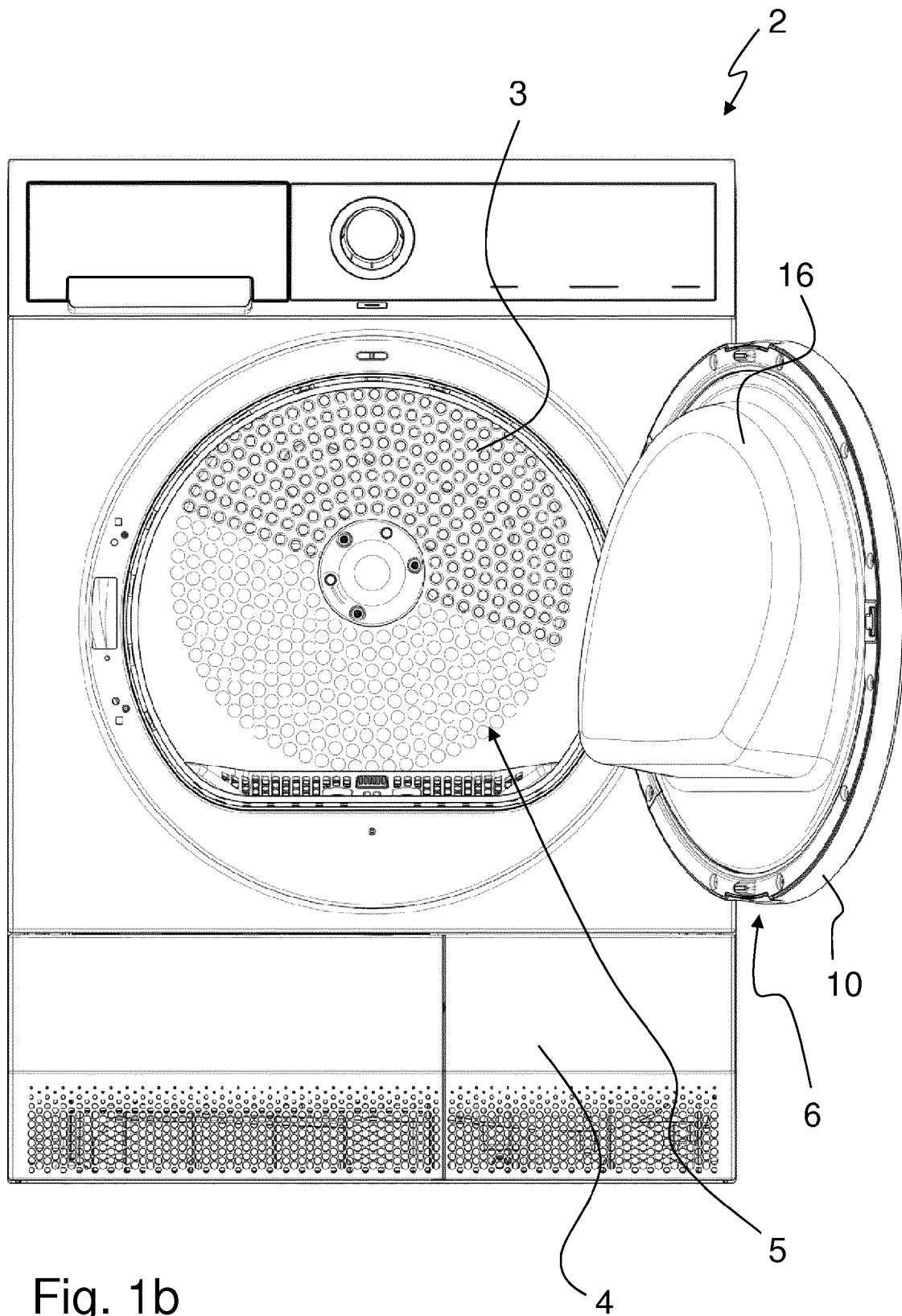
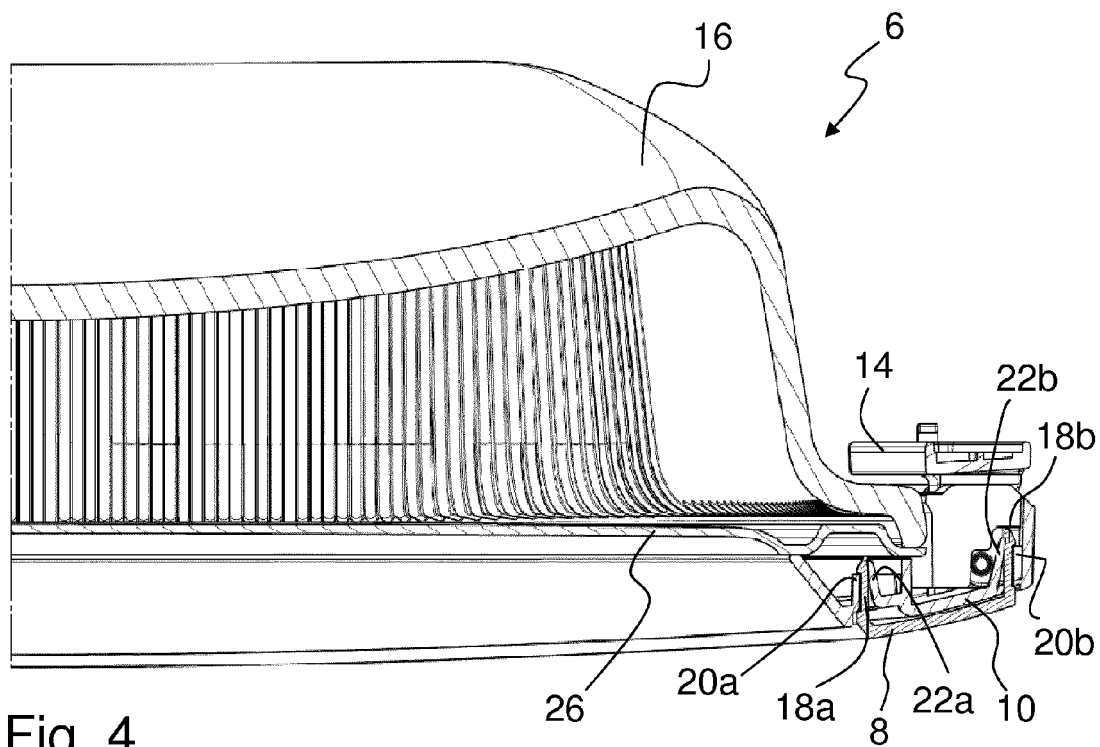
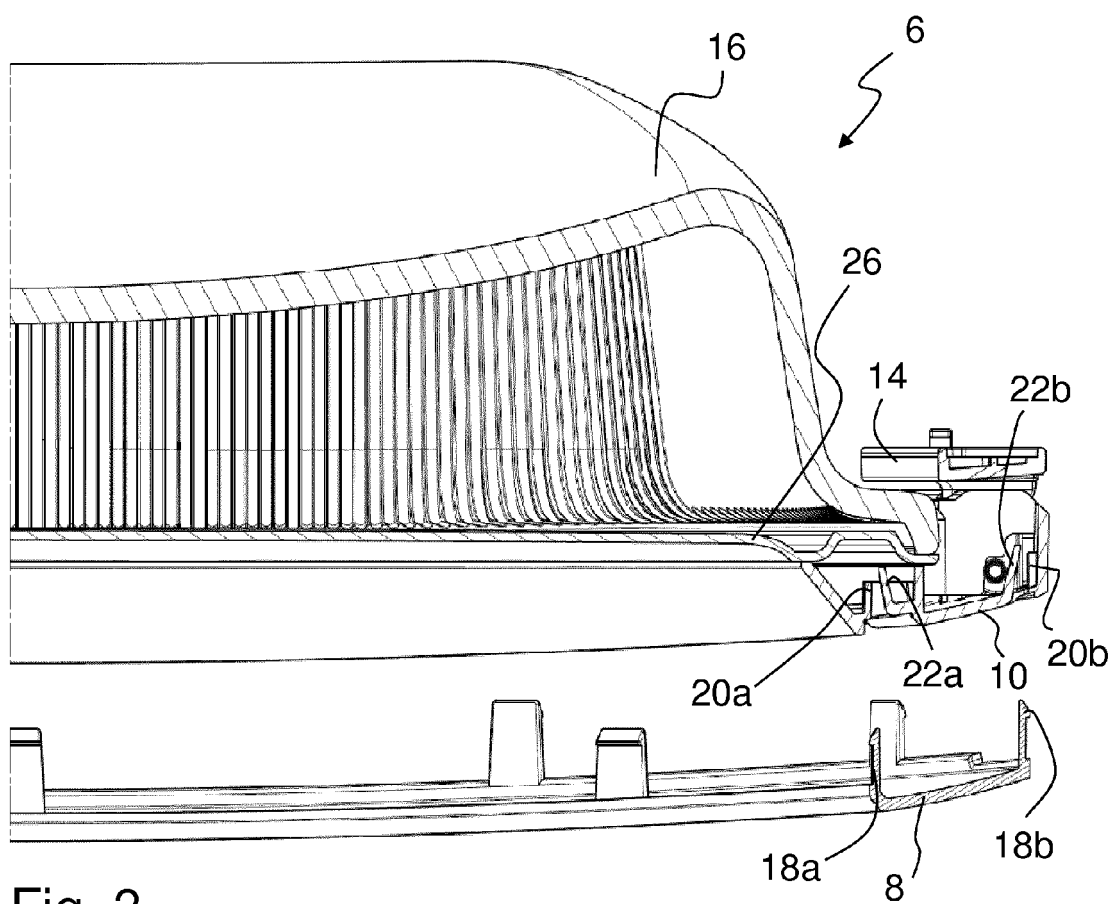
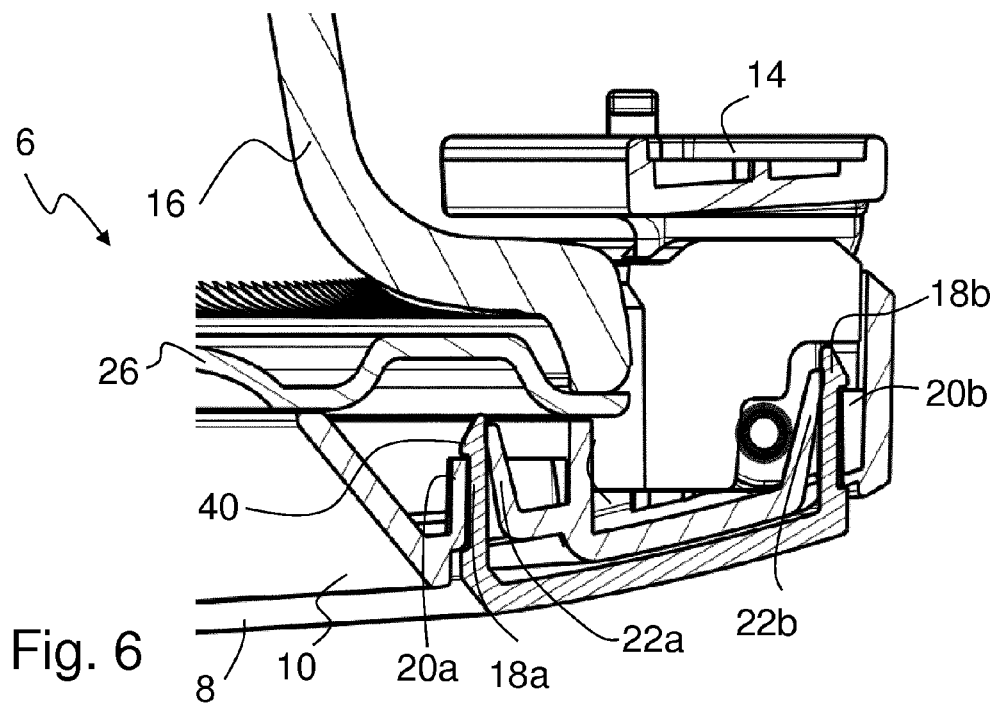
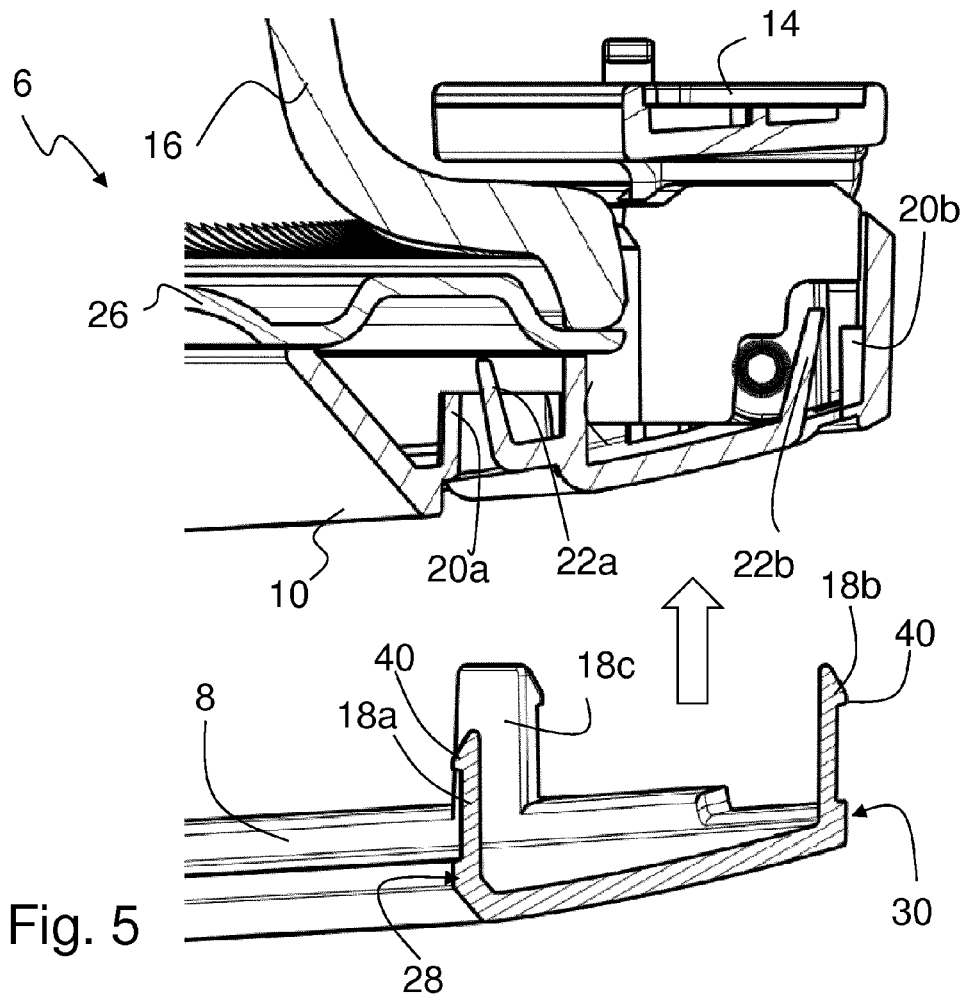


Fig. 1b





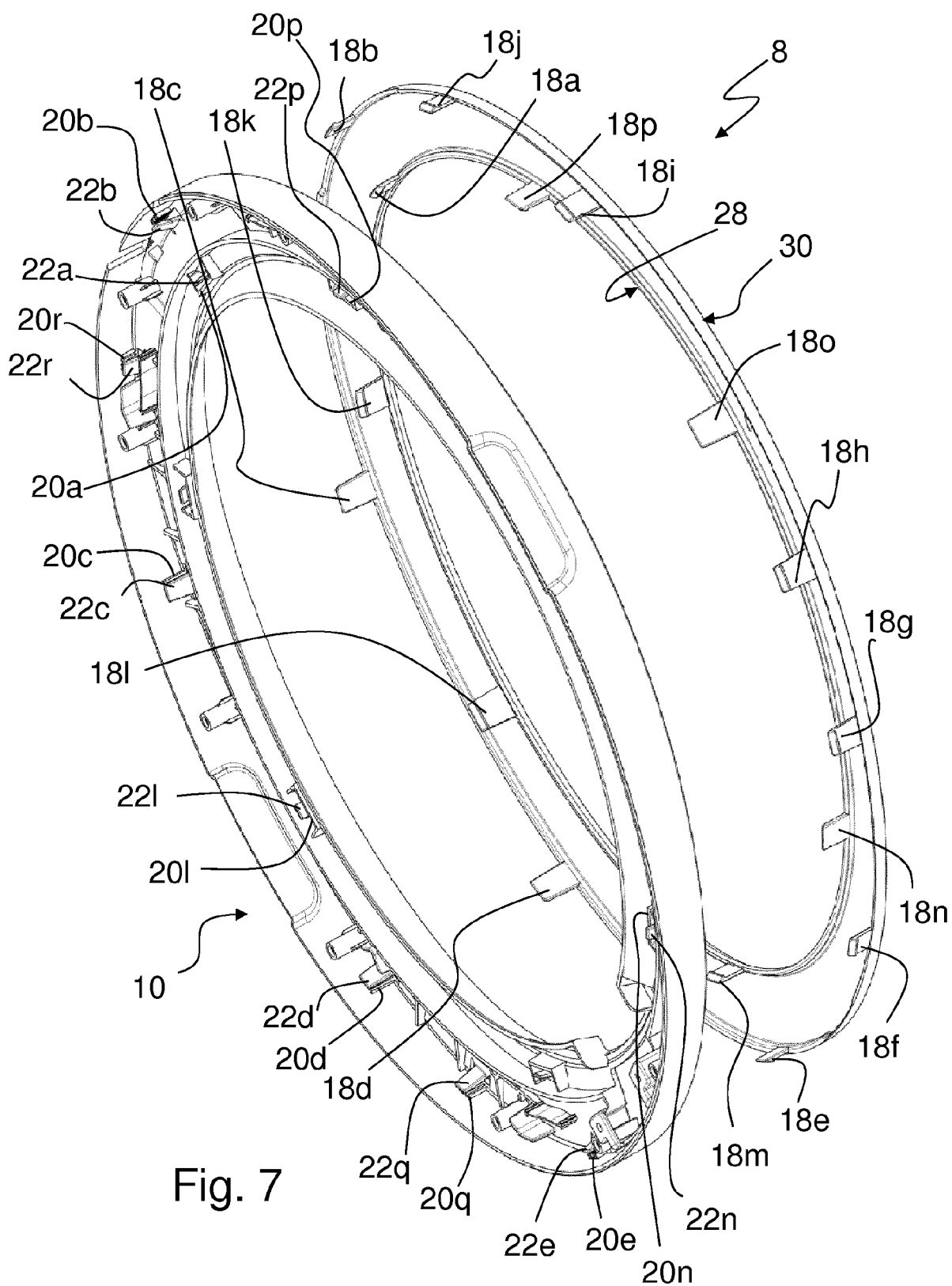


Fig. 8a

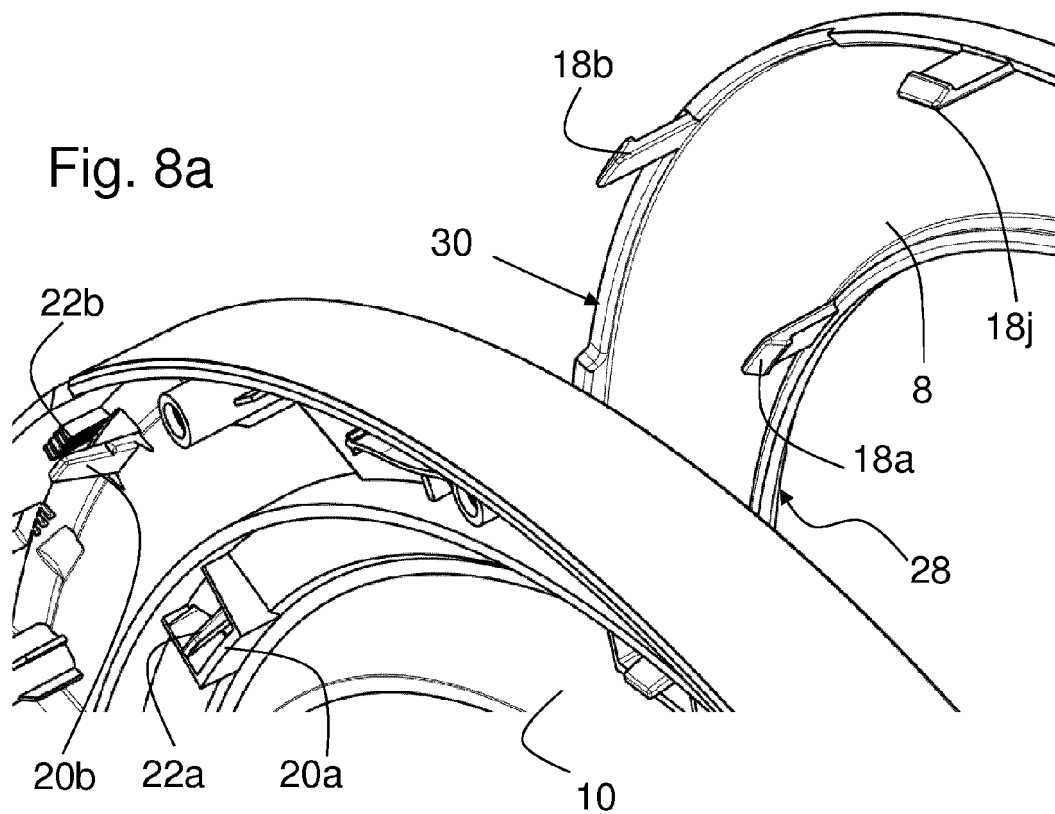
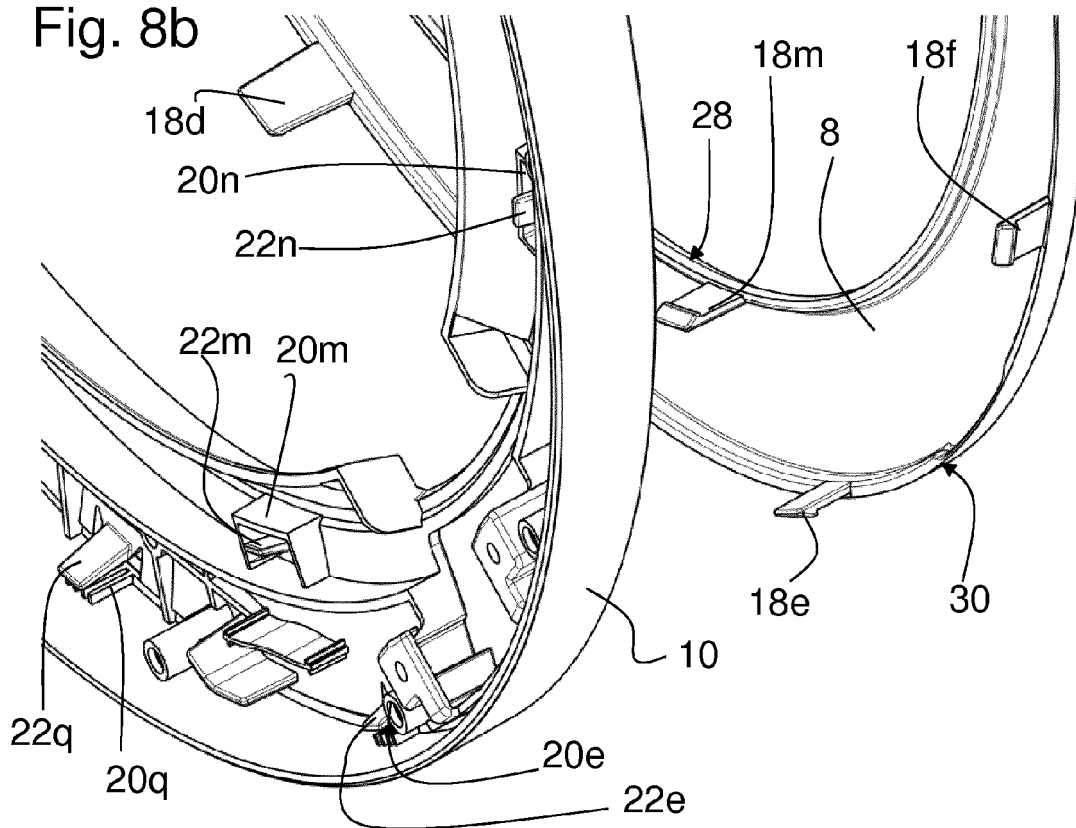


Fig. 8b



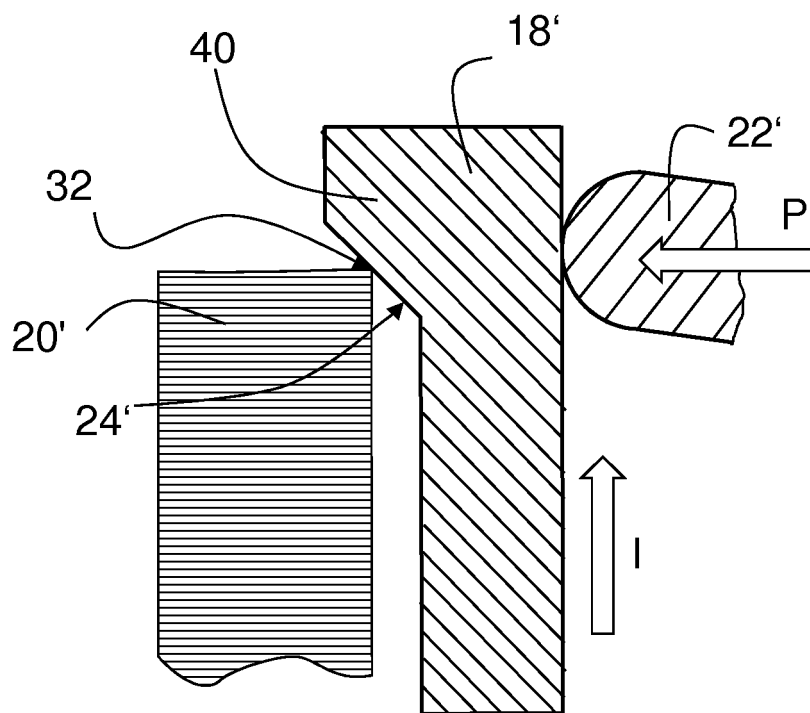


Fig. 9a

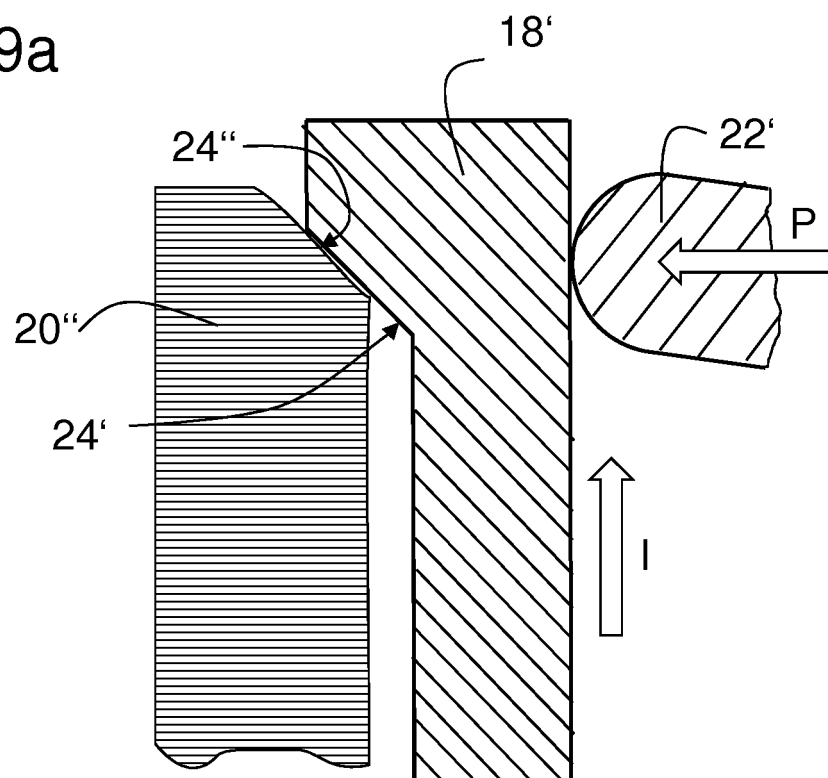


Fig. 9b



EUROPEAN SEARCH REPORT

Application Number
EP 12 17 2358

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Place of search		Date of completion of the search	Examiner
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