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(54) **WASHING MACHINE**

WASCHMASCHINE

MACHINE À LAVER

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(73) Proprietors:
• **Qingdao Haier Washing Machine Co., Ltd.**
Shandong 266101 (CN)
• **Aqua Co., Ltd.**
Chiyoda-ku
Tokyo 100-0005 (JP)

(72) Inventor: **NISHIURA, Naoto**
Tokyo 100-0005 (JP)

(74) Representative: **HGF Limited**
4th Floor
Merchant Exchange
17-19 Whitworth Street West
Manchester M1 5WG (GB)

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Description

Existing Technical Literature

TECHNICAL FIELD

Patent Literature

[0001] The present invention relates to a washing machine.

5 [0006] Patent Literature 1: Japanese Laid-Open Patent Publication No.2013-141553

BACKGROUND

Problems to be solved in the invention

[0002] In the past, one of structures for collecting lint and dust in washings during washing in a full-automatic washing machine may adopt a thread collection structure as shown in Fig. 10. A washing machine that adopts the filtration and collection structure is recorded in, for example, patent literature 1.

10 [0007] The water path forming member 510 can be formed by a resin material. In this case, the water path forming member 510 is prepared by forming with a mold.
[0008] Fig. 10(b) is a diagram illustrating a main part of a mold M for forming the water path forming member 510. For example, for the forming of the water path forming member 510, the mold M which consists of a first mold M1 at a front side and a second mold M2 at a back side and cut along a front-back direction of the water path forming member 510 can be used. In this case, since one side of the first supporting shaft 512 is formed by the second mold M2, an opening part 515 through which the second mold M2 passes is formed in the rear surface 511c of the filter installation part 511 in a position of a back of the first supporting shaft 512. It should be noted that, a third mold sliding towards a protruding direction of the first supporting shaft 512 can also be added to the mold M, and the first supporting shaft 512 is formed through the third mold. However, in this case, the opening part 515 is not formed, and a sliding trace may be formed in the rear surface 511c, thereby damaging an appearance and a condition or hooking the lint and the like.

[0003] Fig. 10(a) is a sectional view illustrating a main part of a washing and dewatering drum 500 of a thread filtration and collection structure. A circulating water path 520 is formed on a side surface part of the washing and dewatering drum 500 through a water path forming member 510. A filter installation part 511 sunk rearward is formed in the water path forming member 510, and a filter unit 530 is arranged on the filter installation part 511 in a free loading and unloading manner. A first supporting shaft 512 protruding upward is formed on a lower surface 511a of the filter installation part 511, a first shaft hole 513 is formed in an upper surface 511b, and an outflow opening 514 is formed in a rear surface 511c. A second shaft hole 531 arranged on a lower part of the filter unit 530 is embedded into the first supporting shaft 512, and a second supporting shaft 532 arranged on an upper part of the filter unit 530 is embedded into the first shaft hole 513. Thus, the filter unit 530 only can rotate by a specified angle in a left-right direction by taking the first supporting shaft 512 and the second supporting shaft 532 as rotating shafts. A circulating water path 520 is connected to a side surface of an impeller 540.

20 [0009] The opening part 515 formed in the water path forming member 510 is connected with the circulating water path 520. Therefore, as shown by an arrow F3 in Fig. 10(a), part of water flowing through the circulating water path 520 towards the outflow opening 514 flows out of the opening part 515. Water flowing out returns to the washing and dewatering drum 500 without passing through the filter unit 530. In this case, collection efficiency of lint and the like of the filter unit 530 may be reduced.

[0004] When the impeller 540 rotates, as shown by an arrow F1, water pushed out by a water pumping blade 541 of the impeller 540 towards an outer circumferential direction is led into the circulating water path 520, flows out of the outflow opening 514, flows through the filter unit 530 and returns to the washing and dewatering drum 500. At this moment, lint and the like included in water are collected by the filter unit 530.

30 [0010] Further relevant technologies are also known from JP2000354697A (TOSHIBA CORP) 26 December 2000 which relates to a washing machine disclosed to capture thread waste, dust, etc., from the inside of circulating water mainly in the case of washing at a lower water level than a maximum specified water level, JP2000334198A (SANYO ELECTRIC CO) 5 December 2000 which relates to a washing machine with function of enhancing the performance to capture waste threads in a washing tank, JPH11169594A (TOSHIBA CORP;TOSHIBA AVE KK) 29 June 1999 which relates to a fully automated washing machine whose rinsing performance is improved by enhancing the rate of collecting lint in in-drum water in a washing/spin-drying drum regardless of the level of the in-drum water, JP2003311085A (SANYO ELECTRIC CO) 5 November 2003 which relates to a washing machine with function of improving the washing and rinsing performances es-

[0005] In addition, the filter unit 530 is pushed by a water flow generated by rotation of the impeller 540 for rotating, as shown by an arrow F2; water flowing along an inner circumferential wall of the washing and dewatering drum 500 flows into the filter unit 530 from a suction inlet 533 of a rear surface, and penetrates through the filter unit 530. At this moment, the lint and the like flowing into the filter unit 530 together with water are collected by a thread filter unit 530.

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pecially using an electrolyzed water, and JPH08323096A (TOSHIBA CORP) 10 December 1996 which relates to a dehydrator and washing machine with function of preventing a filter part from falling out and breakage and to make cleaning easier, by installing a flow-in limit part on a filter mechanism to cover the front of the flow-in port to the filter part to open responding to water flow onto a filter mounting member detachably attached. JP2000354697A is considered as the closest prior art, forming the preamble of the independent claim.

SUMMARY

[0011] Therefore, a purpose of the present invention is to provide a washing machine capable of increasing collection efficiency of lint and the like. The present disclosure provides a washing machine according to independent claim 1. Further improvements and embodiments are provided in the dependent claims.

Solution for solving the problems

[0012] Also provided is a washing machine in embodiments of the present invention includes: a washing and dewatering drum for containing washings; an impeller configured at a bottom of the washing and dewatering drum in a free rotation manner; a circulating water path arranged on a side surface part of the washing and dewatering drum for enabling water delivered by rotation of the impeller to flow; a resinous water path forming member configured to form the circulating water path between the resinous water path forming member and an inner circumferential wall of the washing and dewatering drum; a filter installation part formed in the water path forming member; and a filter unit installed on the filter installation part rotatably, configured to suck water returning to the washing and dewatering drum from the circulating water path and water flowing along the inner circumferential wall through a water flow generated by rotation of the impeller and enable water to pass through, and collect lint included in the passing water. Herein, the filter installation part includes a supporting shaft forming a rotating shaft of the filter unit and an opening part formed in the back of the supporting shaft and communicated with an interior of the circulating water path. Then, a wall part inhibiting outflowing of water from the opening part is formed in a surface of the water path forming member facing a surface of the circulating water path towards a side of the inner circumferential wall.

[0013] Through the above structure, since water flowing through the circulating water path can be well led into the filter unit, it is expected to increase the collection efficiency of lint and the like of the filter unit.

[0014] In the washing machine of the present embodiment, the wall part can adopt a structure surrounding a lower side, a left side and a right side of the opening part at least.

[0015] Through the above structure, water divided

transiently due to collision with a wall at a lower side of the wall part can be inhibited from flowing into the opening part from the side surface, and water from the opening part can be further inhibited from flowing out.

[0016] In case of adopting the above structure, further, a gap can be formed between the wall part and the inner circumferential wall.

[0017] When such structure is adopted, in a dewatering process, even if water discharged from washings enters an interior of the wall part surrounding at least three sides of the opening part, the entering water can also flow out of the gap to the circulating water path. Therefore, water can be prevented from remaining in the interior of the wall part all the time.

[0018] For the washing machine in present embodiment, a structure that the wall part includes a protruding part can be adopted, and the protruding part has a shape of which a central part is more protruding towards an upstream side of the circulating water path than two end parts of the opening part in a left-right direction.

[0019] Through the above structure, water flowing through the circulating water path is smoothly divided towards left and right by colliding with the protruding part. Thus, since the reduction of the flow velocity of water in the circulating water path can be inhibited, the lint and the like can be well transported to the filter unit by virtue of water flow.

Effects of the invention

[0020] According to the present invention, a washing machine capable of increasing collection efficiency of the lint and the like can be provided.

[0021] Effects and even significances of the present invention are further clarified through description of embodiments shown below. However, the following embodiments are just an illustration when the present invention is implemented, and the present invention is not limited by any content described in the following embodiments.

BRIEF DESCRIPTION OF DRAWINGS

[0022]

Fig. 1 is a side sectional view illustrating a structure of a full-automatic washing machine involved in embodiments;

Fig. 2 is a longitudinal sectional view illustrating a main part of a washing and dewatering drum of circumferential parts of a circulating water path involved in embodiments;

Fig. 3 is a transverse sectional view illustrating a main part of a washing and dewatering drum of circumferential parts of a circulating water path involved in embodiments;

Fig. 4 is a diagram illustrating a structure of a filter unit involved in embodiments;

Fig. 5 is a main view illustrating a structure of a water

path forming member involved in embodiments;
Fig. 6 is a stereoscopic rear view illustrating a structure of a water path forming member involved in embodiments, however not showing an embodiment of the claimed invention;

Fig. 7 is a diagram illustrating a water flow flowing into a circulating water path towards an outflow opening involved in embodiments, however not showing an embodiment of the claimed invention;

Fig. 8 is a stereoscopic rear view illustrating a main part of a water path forming member of a structure of a water-blocking wall part involved in a change embodiment I, not falling within the scope of the present invention, and a change embodiment II being in accordance with the claimed invention;

Fig. 9 is a diagram schematically illustrating structures of a water-blocking wall part involved in other change embodiments, whereby the structures (a) and (b) are not part of the claimed invention, but are merely shown for illustrative purposes; and

Fig. 10 is a diagram illustrating an example of a thread collection structure.

DETAILED DESCRIPTION

[0023] A full-automatic washing machine in one embodiment of a washing machine in the present invention is described below with reference to drawings.

[0024] Fig. 1 is a side sectional view illustrating a structure of a full-automatic washing machine 1.

[0025] The full-automatic washing machine 1 includes a housing 10 forming an appearance. The housing 10 includes a square cylindrical body part 11 with opened upper and lower surfaces, an upper panel 12 covering the upper surface of the body part 11, and a bearer 13 supporting the body part 11. A throwing inlet 14 for washings is formed in the upper panel 12. The throwing inlet 14 is covered by an upper cover 15 which can be freely opened and closed.

[0026] In the housing 10, an outer drum 20 is elastically suspended and supported by four hanger rods not shown in figures. A washing and dewatering drum 21 is configured in the outer drum 20. The outer drum 20 and the washing and dewatering drum 21 are slightly inclined forward. The washing and dewatering drum 21 rotates by taking a rotating shaft R slightly inclined forward relative to a vertical direction as a center. The housing 10 is provided with a protruding part 10a correspondingly protruding forward to a degree that an upper part of the outer drum 20 protrudes forward.

[0027] A plurality of dewatering holes 21b are formed in an inner circumferential wall 21a of the washing and dewatering drum 21. In addition, a plurality of water through holes 21c are formed in a bottom surface of the washing and dewatering drum 21. Further, a balancing ring 22 is arranged on an upper part of the washing and dewatering drum 21.

[0028] An impeller 23 is configured at a bottom of the

washing and dewatering drum 21. A plurality of blades 23a which radially extend from a center of a surface are formed on the surface of the impeller 23. In addition, a plurality of water drawing blades 23b which radially extend from a center of a back are formed in a back of the impeller 23. The water drawing blades 23b are configured in a pump chamber 24 formed between the back of the impeller 23 and the bottom surface of the washing and dewatering drum 21.

[0029] A circulating water path 25 extending towards upper and lower directions along the inner circumferential wall 21a of the washing and dewatering drum 21 is formed by a water path forming member 26 and the inner circumferential wall 21a. A lower end part of the circulating water path 25 is connected with the pump chamber 24. A filter unit 27 is detachably mounted on the circulating water path 25, i.e. the water path forming member 26 forming the circulating water path 25. The filter unit 27 collects lint and dust generated from washings during washing.

[0030] A drive unit 30 for generating a torque and driving the washing and dewatering drum 21 and the impeller 23 is configured at an outer bottom of the outer drum 20. The drive unit 30 includes a drive motor 31 and a transmission mechanism part 32. The transmission mechanism part 32 includes a clutch mechanism. Due to a switching operation performed by the clutch mechanism, the torque of the drive motor 31 is only transmitted to the impeller 23 to enable the impeller 23 to rotate only in a washing process and a rinsing process; while in a dewatering process, the torque of the drive motor 31 is transmitted to the impeller 23 and the washing and dewatering drum 21 to enable the impeller 23 and the washing and dewatering drum 21 to integrally rotate. In addition, the transmission mechanism part 32 has a speed reducing mechanism. In the washing process and the rinsing process, the impeller 23 rotates at a rotating speed of the drive motor 31 being reduced according to a reduction ratio of the speed reducing mechanism.

[0031] A water outlet part 20a is formed at the outer bottom of the outer drum 20. A drainage valve 40 is arranged at the water outlet part 20a and is connected with a drainage hose 41. When the drainage valve 40 is opened, water stored in the washing and dewatering drum 21 and the outer drum 20 is discharged out of the machine by the drainage hose 41.

[0032] A water supply unit 50 used for supplying running water into the washing and dewatering drum 21 is configured on a rear part of the upper panel 12. The water supply unit 50 is connected with a water supply valve 51. The water supply valve 51 is connected with a water faucet. Detergents are thrown into the water supply unit 50 during washing operation. The running water is guided into the water supply unit 50 when the water supply valve 51 is opened. The guided-in running water flows out of the water supply unit 50 after mixed with detergents in the water supply unit 50, and is supplied into the washing and dewatering drum 21.

[0033] The full-automatic washing machine 1 performs washing operations in various operating modes. The washing operations include washing process, intermediate dewatering process, rinsing process and final dewatering process.

[0034] In the washing process and the rinsing process, the impeller 23 rotates to a right direction and a left direction in a state that water is stored in the washing and dewatering drum 21. A water flow is produced in the washing and dewatering drum 21 due to the rotation of the impeller 23. Washings are cleaned by the produced water flow and detergents contained in water in the washing process. Washings are rinsed by the produced water flow in the rinsing process.

[0035] In the intermediate dewatering process and the final dewatering process, the washing and dewatering drum 21 and the impeller 23 integrally rotate at a high speed. Washings are dewatered by virtue of an action of a centrifugal force generated by the washing and dewatering drum 21.

[0036] The full-automatic washing machine 1 in the present embodiment is characterized in a thread collection structure composed of the circulating water path 25 and the filter unit 27. The thread collection structure is described below in detail.

[0037] Fig. 2 is a longitudinal sectional view illustrating a main part of a washing and dewatering drum 21 of circumferential parts of a circulating water path 25. Fig. 3 is a transverse sectional view illustrating a main part of a washing and dewatering drum 21 of circumferential parts of a circulating water path 25. Fig. 3(a) shows a state when a right-handed water flow is generated. Fig. 3(b) shows a state when a left-handed water flow is generated. Fig. 4 is a diagram illustrating a structure of a filter unit 27. Fig. 4(a) is a stereoscopic diagram illustrating a filter unit 27. Fig. 4(b) is a side longitudinal sectional view illustrating a filter unit 27. Fig. 5 and Fig. 6 are respectively a main view and a stereoscopic rear view illustrating a structure of a water path forming member 26.

[0038] The filter unit 27 is provided with a thread filter 110 and a filter box 120. The thread filter 110 is formed by a bag body of mesh fabrics. The filter box 120 is formed into a hollow lengthwise cube shape, and a rear surface of the filter box 120 is used as an opening of a suction inlet 121. An installation opening part 122 is formed in a front surface of the filter box 120, and the thread filter 110 is installed on the installation opening part 122.

[0039] An elastic sheet 123 capable of bending downward is formed on an upper end part of the filter box 120, and an upper supporting shaft 124 protruding upward is formed on an upper surface of the elastic sheet 123. In addition, an operation sheet 125 is formed on a front end part of the elastic sheet 123. A user can enable the elastic sheet 123 to bend downward by pressing the operation sheet 125 with a finger. Further, a lower shaft hole 126 is formed at a lower end part of the filter box 120.

[0040] The water path forming member 26 is formed by a resin material, extends up and down and is slightly

bulged forward. A surface of the water path forming member 26 faces towards an interior of the washing and dewatering drum 21, and a back of the water path forming member 26 faces towards an interior of the circulating water path 25. A filter installation part 201 sunk into a shape corresponding to the filter box 120 of the filter unit 27 is formed on the surface of the water path forming member 26.

[0041] A lower supporting shaft 202 protruding upward is formed at a bottom 201a of the filter installation part 201, and an upper shaft hole 203 is formed at a top 201b of the filter installation part 201. The lower supporting shaft 202 is equivalent to a supporting shaft of the present invention.

[0042] On a rear surface 201c of the filter installation part 201, a plurality of outflow openings 204 are formed at a central part and a place of the central part slightly close to the bottom. In addition, on the rear surface 201c of the filter installation part 201, a recess 205 is formed in an upper part. When the filter unit 27 is installed on the filter installation part 201, a rear part of the elastic sheet 123 of the filter unit 27 is accommodated in the recess 205.

[0043] Then, on the rear surface 201c of the filter installation part 201, a square opening part 206 slightly bigger than the lower supporting shaft 202 is formed in a position of a back of the lower supporting shaft 202. The water path forming member 26 is formed with a mold by molding. As shown in Fig. 10(b), the opening part 206 is formed for a mold for forming the lower supporting shaft 202 to pass during molding manufacturing. The opening part 206 is communicated with an interior of the circulating water path 25.

[0044] On the surface of the water path forming member 26, a plurality of right flow paths 207 and left flow paths 208 sinking like the filter installation part 201 and extending towards a left-right direction are respectively formed at left and right sides of the filter installation part 201.

[0045] A double-structured water path division rib 209 is formed on the back of the water path forming member 26 by facing a rear. An inner region of the water path division rib 209 forms the circulating water path 25. Then, on the back of the water path forming member 26, around the opening part 206, a water-blocking wall part 210 is formed towards the rear, namely, towards a side of an inner circumferential wall 21a of the washing and dewatering drum 21. The water-blocking wall part 210 is equivalent to a wall part of the present invention. The water-blocking wall part 210 is formed into a square cylinder shape in a form of surrounding four sides of the opening part 206, and has a lower wall 211, an upper wall 212, a left wall 213 and a right wall 214. As shown in Fig. 2, in a state that the water path forming member 26 is installed on the inner circumferential wall 21a of the washing and dewatering drum 21, a specified gap S is formed between the water-blocking wall part 210 and the inner circumferential wall 21a.

[0046] The filter unit 27 is installed on the filter installation part 201 of the water path forming member 26. When installing the water path forming member 26, the user firstly embeds the lower supporting shaft 202 of the filter installation part 201 into the lower shaft hole 126 of the filter unit 27. Next, the user presses the operation sheet 125 of the filter unit 27, to enable an upper part of the filter unit 27 to move rearward while enabling the elastic sheet 123 to bend downward in a manner of enabling the upper supporting shaft 124 to be lower than the upper shaft hole 203 of the filter installation part 201. Then, when the upper supporting shaft 124 reaches a position of the upper shaft hole 203, the user releases bending of the elastic sheet 123 to embed the upper supporting shaft 124 into the upper shaft hole 203. The filter unit 27 is fixed to the water path forming member 26 in a following state: the filter unit 27 can only rotate by a specified angle towards a right direction or a left direction by taking the upper supporting shaft 124 and the lower supporting shaft 202 as rotating shafts when observed from a front surface of the water path forming member 26.

[0047] Next, with reference to Fig. 2 and Fig. 3, a collection action on the lint and the like in the filter unit 27 is described.

[0048] In the washing process or rinsing process, when the impeller 23 rotates, water between the washing and dewatering drum 21 and the outer drum 20 penetrates through the water through holes 21c and is sucked into the pump chamber 24 and pushed out towards a circumferential direction by virtue of a drawing action performed by the water drawing blades 23b. As shown by an arrow F1, water pushed out ascends in the circulating water path 25, flows out of the outflow ports 204, and returns into the washing and dewatering drum 21 through the thread filter 110 of the filter unit 27. At this moment, the lint and the like included in water are collected by the thread filter 110.

[0049] In addition, as shown in Figs. 3(a) and (b), when a dextrorotatory or levorotatory water flow is generated due to rotation of the impeller 23, the filter unit 27 is inclined towards a right direction or a left direction. Thus, as shown by an arrow F2, water flowing along the inner circumferential wall 21a of the washing and dewatering drum 21 flows into the filter unit 27 from a suction inlet 121 of the rear surface, and flows through the thread filter 110. At this moment, the lint and the like included in water are collected by the thread filter 110.

[0050] Fig. 7 is a diagram illustrating a water flow flowing to a circulating water path 25 towards an outflow opening 204. The opening part 206 located at an upstream of the outflow opening 204 is surrounded by the water-blocking wall part 210, water rising in the circulating water path 25 is divided towards left and right by colliding with a lower wall 211 of the water-blocking wall part 210, and flows through the left and right sides of the water-blocking wall part 210 to reach the outflow opening 204. Thus, a situation that part of water flowing through the circulating water path 25 flows out of the opening part

206 can be inhibited.

[0051] It should be noted that, in the dewatering process, a situation that water discharged from washings enters into the interior of the water-blocking wall part 210 through the opening part 206 may occur. In this case, the entering water flows into the circulating water path 25 from a gap S between the water-blocking wall part 210 and the inner circumferential wall 21a. Therefore, it is not easy to remain water in the water-blocking wall part 210 all the time.

<Effects of the Present Example>

[0052] Through the present example, the above can inhibit a situation that part of water flowing through the circulating water path 25 flows out of the opening part 206 through the water-blocking wall part 210 arranged on the back of the water path forming member 26. Therefore, since water flowing through the circulating water path 25 can be led in the filter unit 27 well, it is expected to increase the collection efficiency of lint and the like of the filter unit 27.

[0053] In addition, since the water-blocking wall part 210 adopts a structure of surrounding four sides of the opening part 206, water transiently divided at a lower wall 211 can be inhibited from flowing into the opening part 206 from a side surface and water from the opening part 206 can be further inhibited from flowing out.

[0054] Further, since a gap S is formed between the water-blocking wall part 210 and the inner circumferential wall 21a of the washing and dewatering drum 21, water entering the interior of the water-blocking wall part 210 in the dewatering process can flow out of the gap S and flow into the circulating water path 25, and water can be prevented from remaining in the interior of the water-blocking wall part 210 all the time.

<Change Embodiment I >

[0055] Fig. 8(a) is a stereoscopic rear view illustrating a main part of a water path forming member 26 of a structure of a water-blocking wall part 210A involved in a change embodiment I, which does not form part of the claimed invention.

[0056] The water-blocking wall part 210A in the present change embodiment is only composed of a lower wall 211 extending towards a left-right direction at a lower edge of the opening part 206. The width of the water-blocking wall part 210A is set to be bigger than the horizontal width of the opening part 206. Water rising in the circulating water path 25 is divided towards left and right by colliding with the water-blocking wall part 210A, and flows through outer left and right sides of the opening part 206 to reach the outflow opening 204.

[0057] Therefore, through the present change embodiment, a situation that part of water flowing through the circulating water path 25 flows out of the opening part 206 can also be inhibited, and it is expected to increase

the collection efficiency of lint and the like of the filter unit 27.

<Change Embodiment II >

[0058] Fig. 8(b) is a stereoscopic rear view illustrating a main part of a water path forming member 26 of a structure of a water-blocking wall part 210B involved in the change embodiment II, which illustrates an embodiment according to the claimed invention.

[0059] The water-blocking wall part 210B of the present change embodiment includes a protruding part 215 below the lower wall 211. The protruding part has a rough V shape of which a central part is more protruding towards an upstream side of the circulating water path 25 than left and right ends. Water rising in the circulating water path 25 is divided towards left and right by colliding with the protruding part 215, and flows through the left and right sides of the water-blocking wall part 210B to reach the outflow opening 204.

[0060] Therefore, through the present change embodiment, a situation that part of water flowing through the circulating water path 25 flows out of the opening part 206 can also be inhibited, and it is expected to increase the collection efficiency of lint and the like of the filter unit 27.

[0061] Further, through the present change embodiment, water flowing through the circulating water path 25 is smoothly divided towards left and right by colliding with the protruding part 215. Thus, since the reduction of the flow velocity of water in the circulating water path 25 can be inhibited, the lint and the like can be transported to the filter unit 27 by virtue of water flow well.

<Other Change Embodiments>

[0062] In addition to the water-blocking wall part 210 of the above embodiment, the water-blocking wall part 210A of the above change embodiment I and the water-blocking wall part 210B of the above change embodiment II, the wall part for inhibiting water from the opening part 206 from flowing out can also be configured to be associated with the opening part 206, e.g., various water-blocking wall parts 210C-210I as shown in Fig. 9, whereby the examples shown in figures 9 (a) and (b) do not form part of the present invention, but are shown for illustrative purposes.

[0063] For example, as shown in Fig. 9(a), a water-blocking wall part 210C having no upper wall 212 and surrounding the opening part 206 by a lower wall 211, a left wall 213 and a right wall 214 can also be configured. In addition, as shown in Fig. 9(a), a water-blocking wall part 210D that the lower wall 211, the left wall 213 and the right wall 214 are provided but the left wall 213 and the right wall 214 do not extend to an upper end of the opening part 206 can also be arranged. Since a situation that water transiently divided at the lower wall 211 flows into the opening part 206 from the side surface can be

inhibited as long as at least a lower side, a left side and a right side of the opening part 206 are surrounded in a manner shown in the water-blocking wall parts 210C and 210D in Figs. 9(a) and (b), outflowing of the water from the opening part 206 can be further inhibited compared with the water-blocking wall part 210A only composed of the lower wall 211 in the change embodiment I.

[0064] Then, as shown in Fig. 9(c), a water-blocking wall part 210E that no lower wall 211 is provided and a V-shaped protruding part 215 protruding from left and right walls 213 and 214 is formed can also be configured.

Then, as shown in Figs. 9(d) and (e), water-blocking wall parts 210F and 210G having non-V-shaped circular arc or U-shaped protruding part 216 can also be configured.

Then, as shown Fig. 9(f), a water-blocking wall part 210H only composed of the V-shaped protruding part 215 can also be configured. Then, as shown in Fig. 9(g), a water-blocking wall part 210I only composed of the circular arc or U-shaped protruding part 216 can also be configured.

[0065] Then, in the above embodiment, the water path forming member 26 extends upward to a position of the balancing ring 22. A position closer to the top than the filter unit 27 plays a function as a baffle plate rubbed by washings stirred through the passing water flow. However, an upper position does not play the function of the circulating water path 25, so can be removed.

[0066] Further, in above embodiments, the outer drum 20 and the washing and dewatering drum 21 are inclined forward, but can also be not inclined.

[0067] Although a full-automatic washing machine 1 in the above embodiment does not have a clothes drying function, the present invention is also applicable to a full-automatic washing machine with the clothes drying function.

[0068] In addition, various changes can be properly made to embodiments of the present invention within a scope of technical concepts shown in claims.

A list of reference numerals:

[0069] 21: Washing and dewatering drum; 21a: Inner circumferential wall; 23: Impeller; 25: Circulating water path; 26: Water path forming member; 27: Filter unit; 201: Filter installation part; 202: Lower supporting shaft (supporting shaft); 206: Opening part; 210: Water-blocking wall part (wall part); 210A-210I: Water-blocking wall part (wall part); 215: Protruding part; 216: Protruding part.

Claims

1. A washing machine, comprising:

a washing and dewatering drum (21), for containing washings;
an impeller (23), configured at a bottom of the washing and dewatering drum (21) in a free rotation manner;

- a circulating water path (25), arranged on a side surface part of the washing and dewatering drum (21) for enabling water delivered by rotation of the impeller (23) to flow;
- a resinous water path forming member (26), configured to form the circulating water path (25) between the resinous water path forming member (26) and an inner circumferential wall of the washing and dewatering drum (21);
- a filter installation part (201), formed in the water path forming member (26); and
- a filter unit (27), installed on the filter installation part (201) rotatably, and configured to suck water returning to the washing and dewatering drum (21) from the circulating water path (25) and water flowing along the inner circumferential wall through a water flow generated by rotation of the impeller (23), enable the water to pass, and collect lint and the like included in the passing water, wherein
- the filter installation part (201) comprises a supporting shaft (202) forming a rotating shaft of the filter unit (27) and an opening part (206) formed at a back of the supporting shaft (202) and communicated with an interior of the circulating water path (25), and
- a wall part (210; 210B) reducing outflowing of water from the opening part (206) is formed on a surface of the water path forming member (26) facing a surface of the circulating water path (25) towards a side of the inner circumferential wall; **characterized in that** the wall part (210; 210B) comprises a lower wall (211) and a protruding part (215) below the lower wall (211), wherein the protruding part (215) has a shape of which a central part is more protruding towards an upstream side of the circulating water path (25) than left and right ends.
2. The washing machine according to claim 1, wherein the wall part (210; 210B) at least surrounds a lower side, a left side and a right side of the opening part (206).
3. The washing machine according to claim 2, wherein a gap is formed between the wall part (210; 210B) and the inner circumferential wall.

Patentansprüche

1. Waschmaschine, umfassend:

eine Wasch- und Entwässerungstrommel (21) zum Aufnehmen von Wäsche;

einen Impeller (23), der an einem Boden der Wasch- und Entwässerungstrommel (21) auf frei rotierende Art und Weise konfiguriert ist;

einen zirkulierenden Wasserpfad (25), der an einem Seitenflächenteil der Wasch- und Entwässerungstrommel (21) angeordnet ist, um dem durch die Rotation des Impellers (23) gelieferten Wasser ein Strömen zu ermöglichen; ein Pfad für harzhaltiges Wasser formendes Element (26), das konfiguriert ist, um den Zirkulationswasserpfad (25) zwischen dem Pfad für harzhaltiges Wasser formenden Element (26) und einer Innenumfangswand der Wasch- und Entwässerungstrommel (21) zu formen;

einen Filterinstallationsteil (201), der in dem Pfad für harzhaltiges Wasser formenden Element (26) geformt ist; und

eine Filtereinheit (27), die drehbar am Filterinstallationsteil (201) installiert und konfiguriert ist, um zur Wasch- und Entwässerungstrommel (21) rückkehrendes Wasser aus dem Zirkulationswasserpfad (25) und entlang der Innenumfangswand strömendes Wasser durch einen durch Rotation des Impellers (23) generierten Wasserstrom zu saugen, wodurch ein Durchlauf des Wassers und ein Sammeln von im durchlaufenden Wasser enthaltenen Fusseln und dergleichen ermöglicht wird, wobei der Filterinstallationsteil (201) eine Trägerwelle (202), die eine rotierende Welle der Filtereinheit (27) formt, und einen an einer Rückseite der Trägerwelle (202) geformten und mit einem Inneren des Zirkulationswasserpfads (25) verbundenen Öffnungsteil (206) umfasst, und ein Wandteil (210; 210B), der das Ausströmen von Wasser aus dem Öffnungsteil (206) reduziert, auf einer Oberfläche des den Wasserpfad formenden Elements (26) gegenüber einer Oberfläche des Zirkulationswasserpfads (25) zu einer Seite der Innenumfangswand geformt ist; **dadurch gekennzeichnet, dass** der Wandteil (210; 210B) eine untere Wand (211) und einen vorragenden Teil (215) unter der unteren Wand (211) umfasst, wobei der vorragende Teil (215) eine Form aufweist, deren zentraler Teil zu einer stromaufwärtigen Seite des Zirkulationswasserpfads (25) mehr vorragt als linke und rechte Enden.

2. Waschmaschine nach Anspruch 1, wobei der Wandteil (210; 210B) mindestens eine untere Seite, eine linke Seite und eine rechte Seite des Öffnungsteils (206) umgibt.
3. Waschmaschine nach Anspruch 2, wobei ein Spalt zwischen dem Wandteil (210; 210B) und der Innenumfangswand geformt ist.

Revendications**1.** Machine à laver, comprenant :

un tambour de lavage et d'essorage (21), pour 5
contenir le linge à laver ;
un rotor (23), configuré au fond du tambour de
lavage et d'essorage (21) de manière à tourner
librement ;
un chemin d'eau en circulation (25), agencé sur 10
une partie de surface latérale du tambour de la-
vage et d'essorage (21) pour permettre la circu-
lation de l'eau fournie par la rotation du rotor
(23) ;
un élément résineux formant un chemin d'eau 15
(26), configuré pour former le chemin d'eau en
circulation (25) entre l'élément résineux formant
un chemin d'eau (26) et une paroi circonféren-
tielle intérieure du tambour de lavage et d'esso-
rage (21) ; 20
une partie de montage de filtre (201), formée
dans l'élément formant un chemin d'eau (26); et
un filtre (27), monté de manière rotative sur la
partie de montage de filtre (201), et configuré
pour aspirer l'eau retournant du chemin d'eau 25
en circulation (25) au tambour de lavage et d'es-
sorage (21) et l'eau circulant le long de la paroi
circonférentielle intérieure par un débit d'eau
produit par la rotation du rotor (23), permettre à 30
l'eau de passer, et collecter la peluche et les
matières similaires incluses dans l'eau qui pas-
se, dans laquelle
la partie de montage de filtre (201) comprend
un arbre de support (202) formant un arbre ro-
tatif du filtre (27) et une partie d'ouverture (206) 35
formée à l'arrière de l'arbre de support (202) et
en communication avec l'intérieur du chemin
d'eau en circulation (25), et
une partie formant paroi (210; 210B) réduisant
le débit de sortie d'eau de la partie d'ouverture 40
(206) est formée sur une surface de l'élément
formant un chemin d'eau (26) faisant face à une
surface du chemin d'eau en circulation (25) vers
un côté de la paroi circonférentielle intérieure ;
caractérisée en ce que la partie formant paroi 45
(210; 210B) comprend une paroi inférieure (211)
et une partie en saillie (215) en dessous de la
paroi inférieure (211), dans laquelle la partie en
saillie (215) a une forme dont une partie centrale
dépassé plus vers un côté amont du chemin 50
d'eau en circulation (25) qu'aux extrémités gau-
che et droite.

2. Machine à laver selon la revendication 1, dans la-
quelle 55

la partie formant paroi (210; 210B) entoure au moins
un côté inférieur, un côté gauche et un côté droit de
la partie d'ouverture (206).

3. Machine à laver selon la revendication 2, dans la-
quelle
un espace est formé entre la partie formant paroi
(210; 210B) et la paroi circonférentielle intérieure.

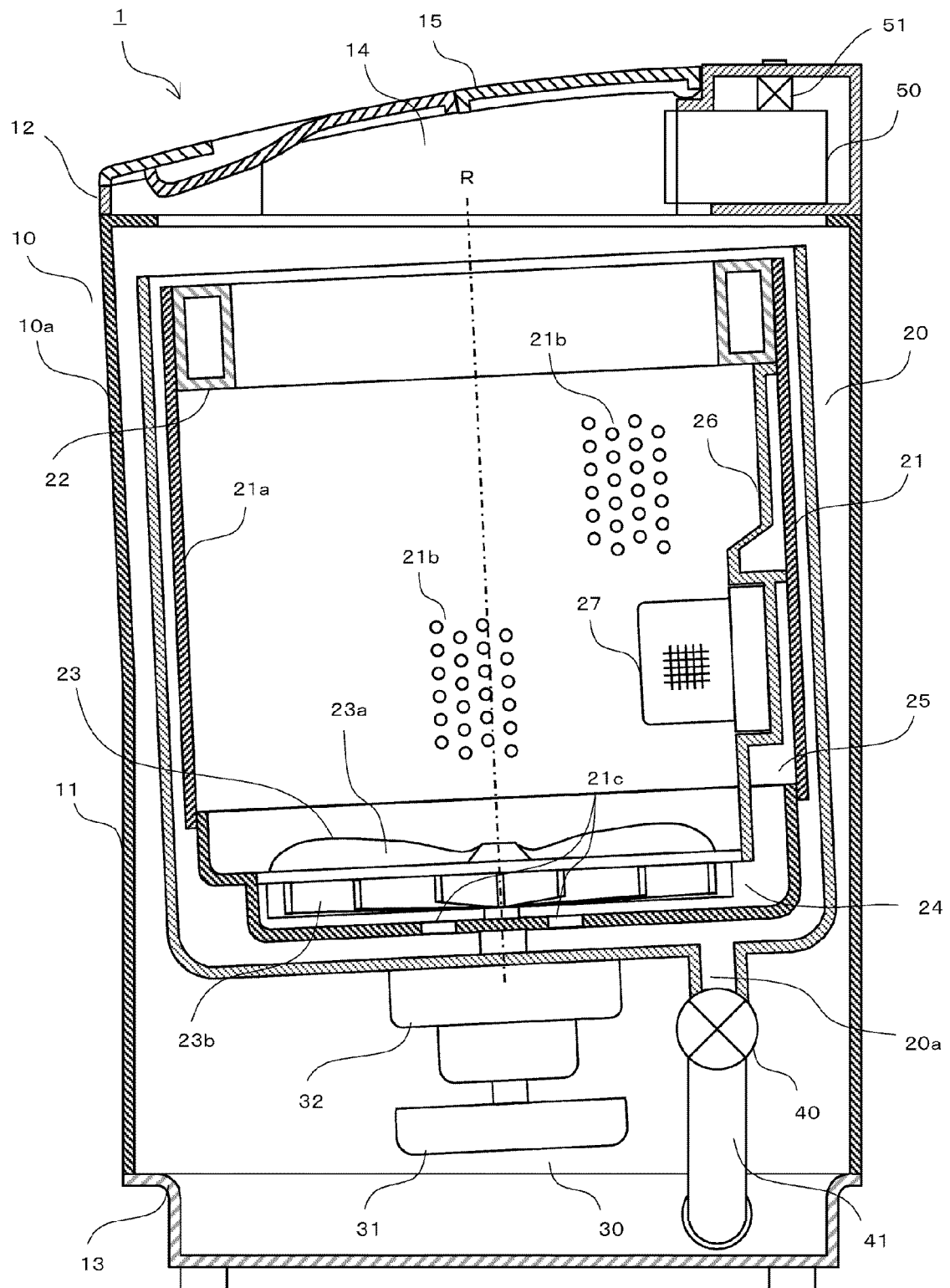


FIG. 1

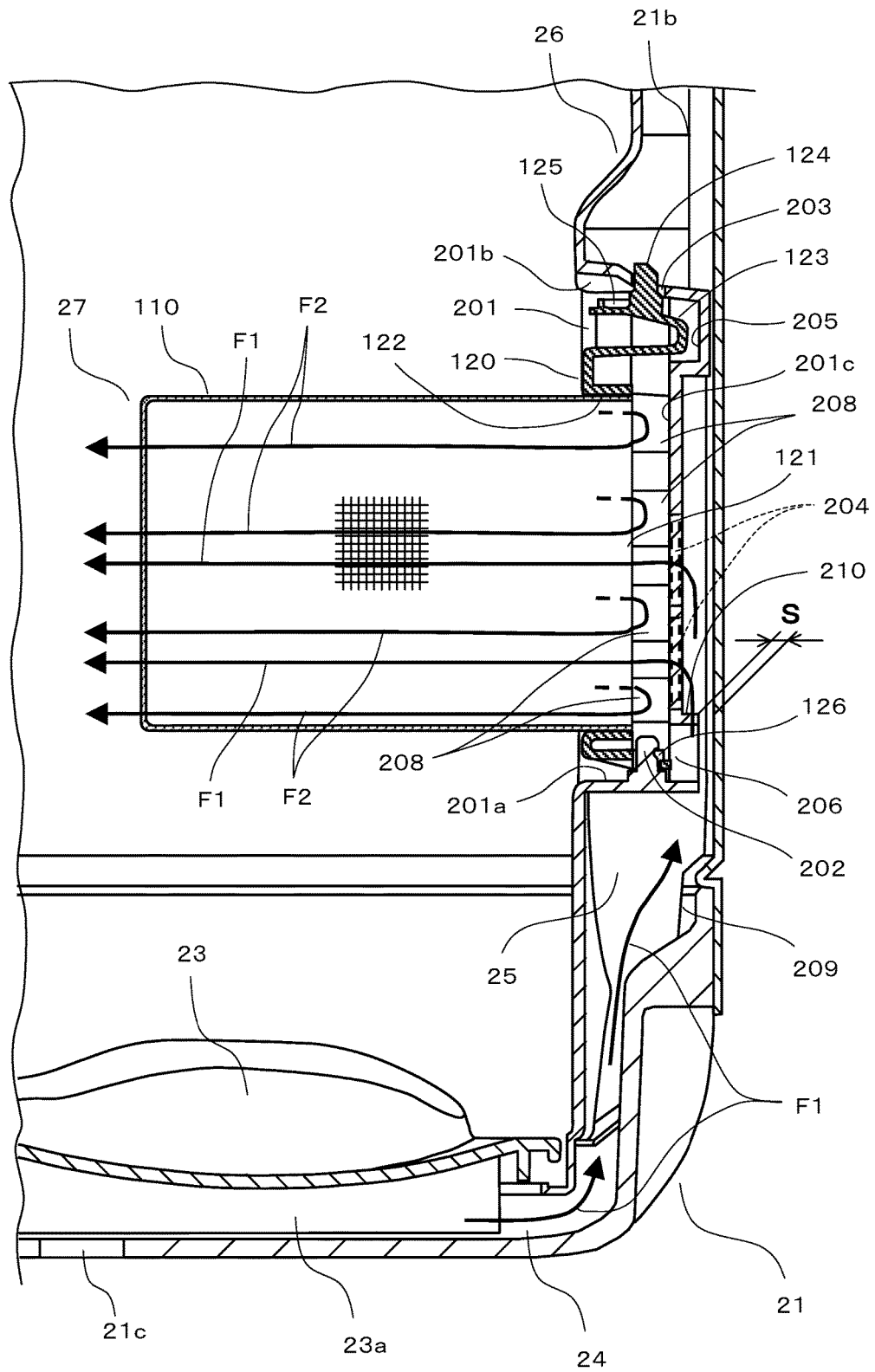
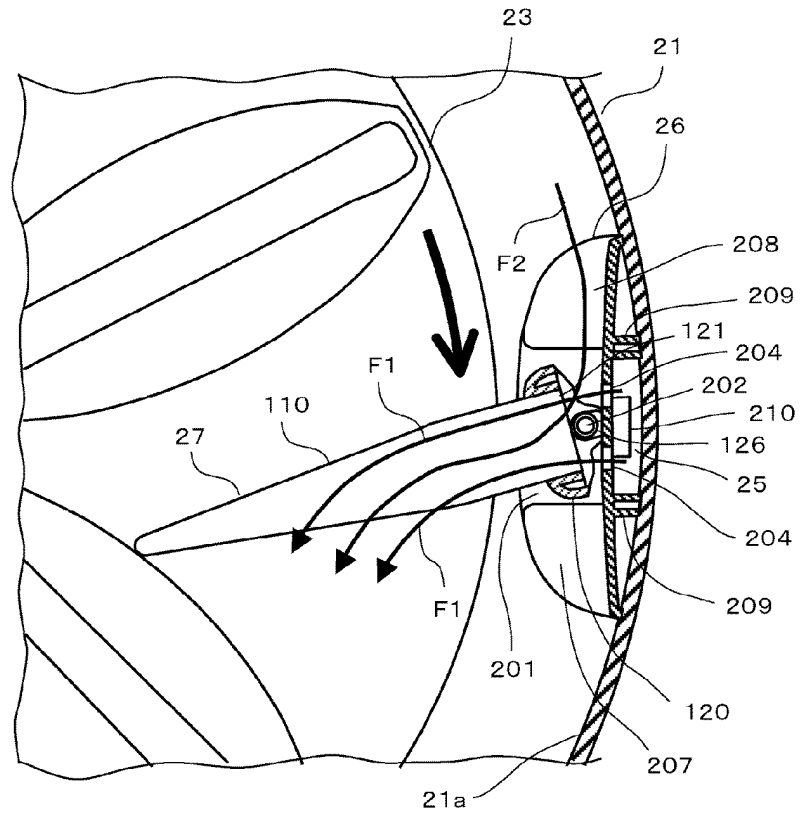


FIG. 2

(a)



(b)

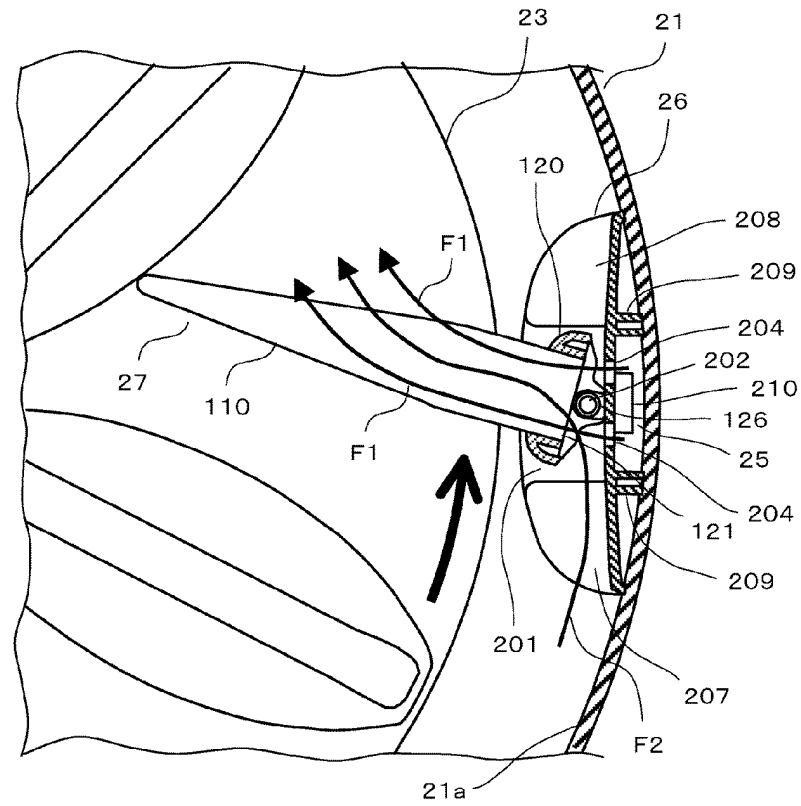


FIG. 3

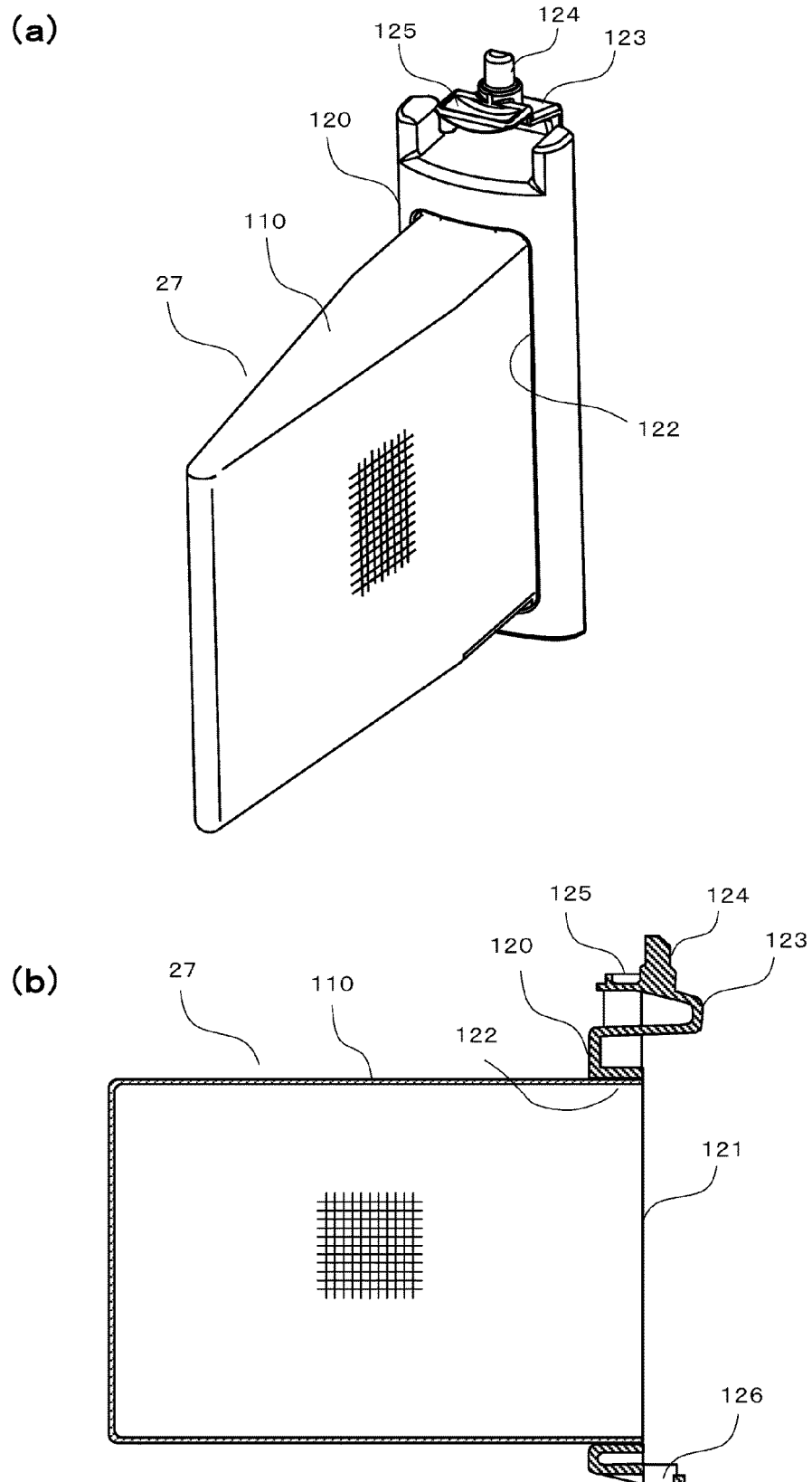


FIG. 4

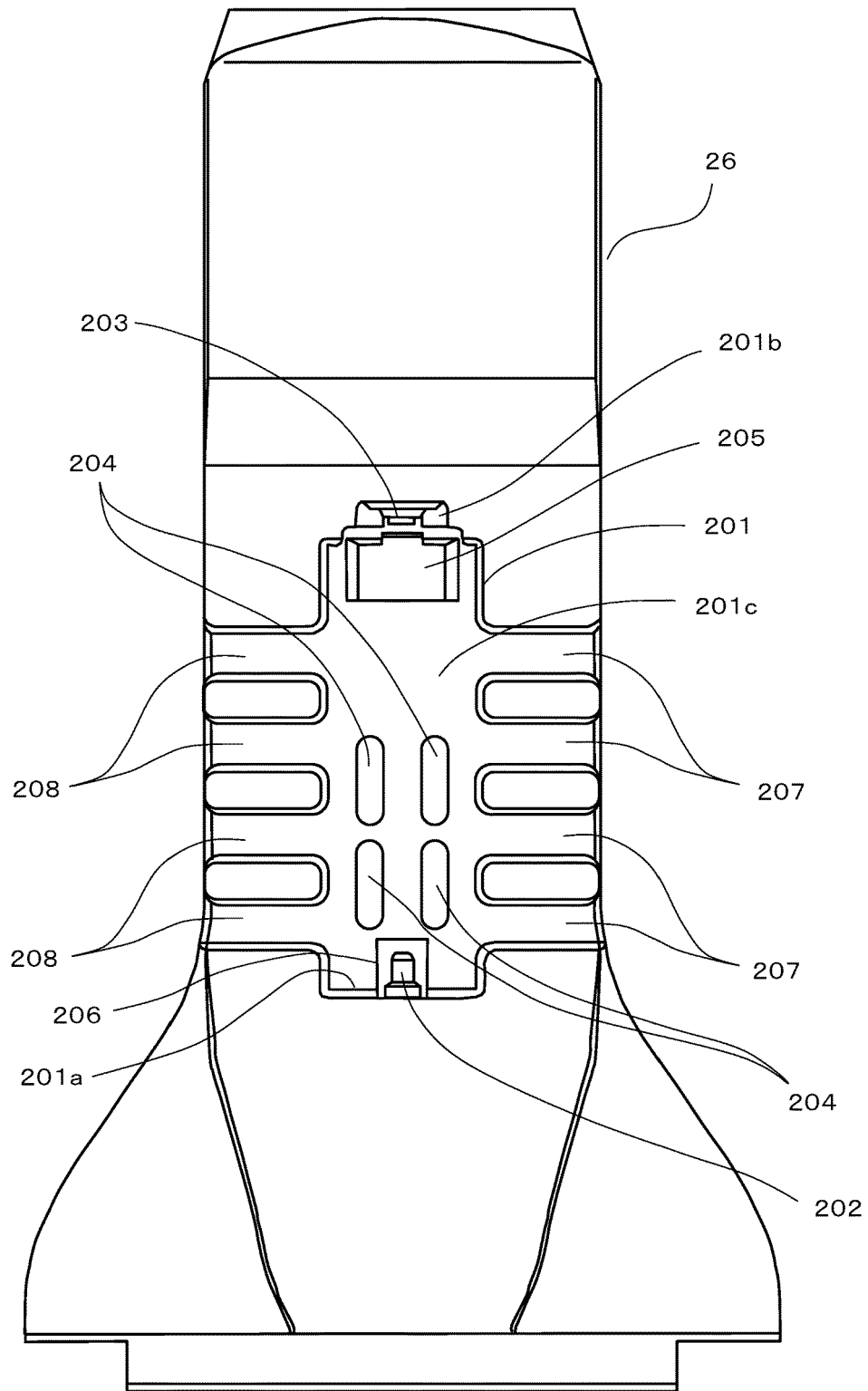


FIG. 5

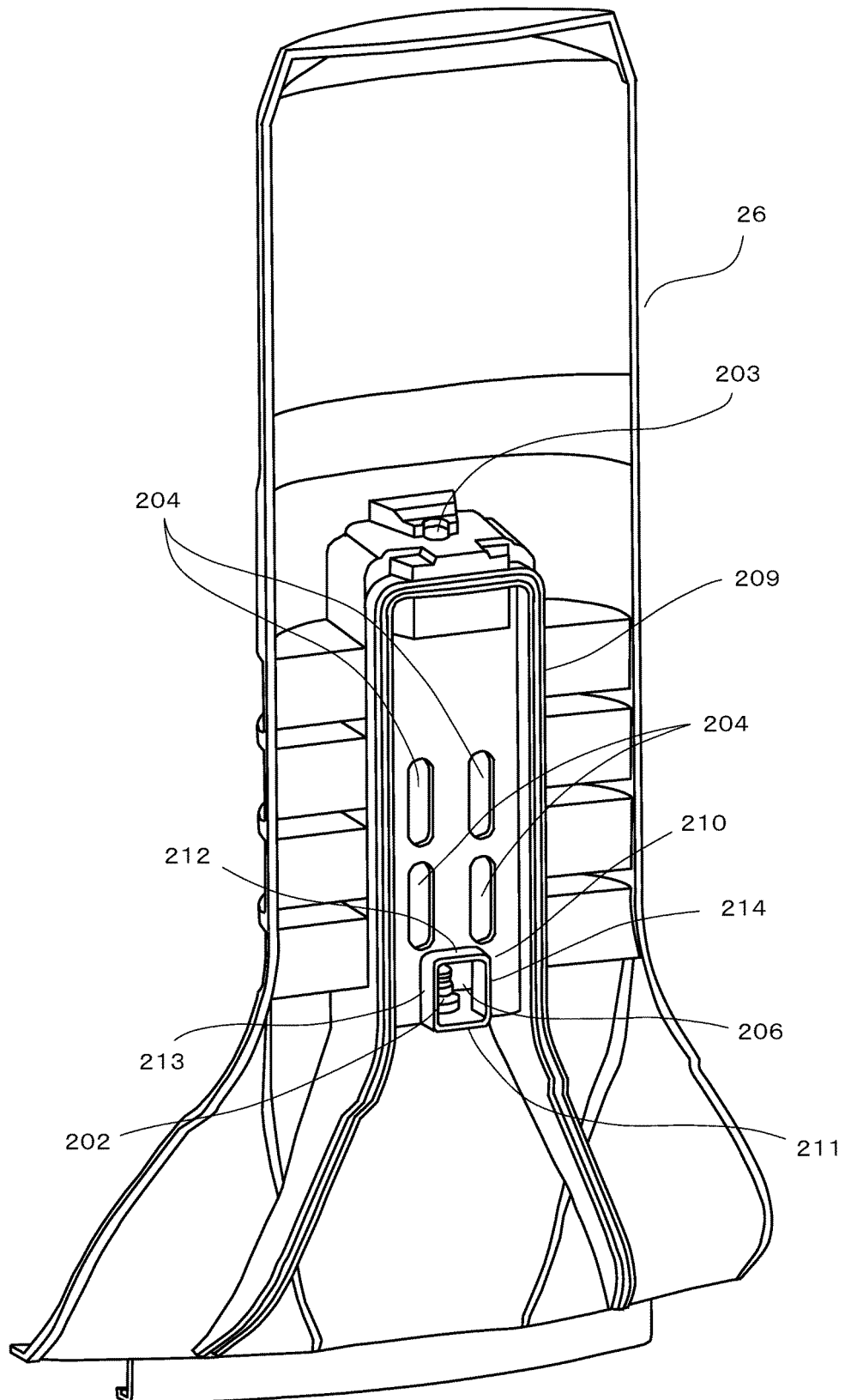


FIG. 6

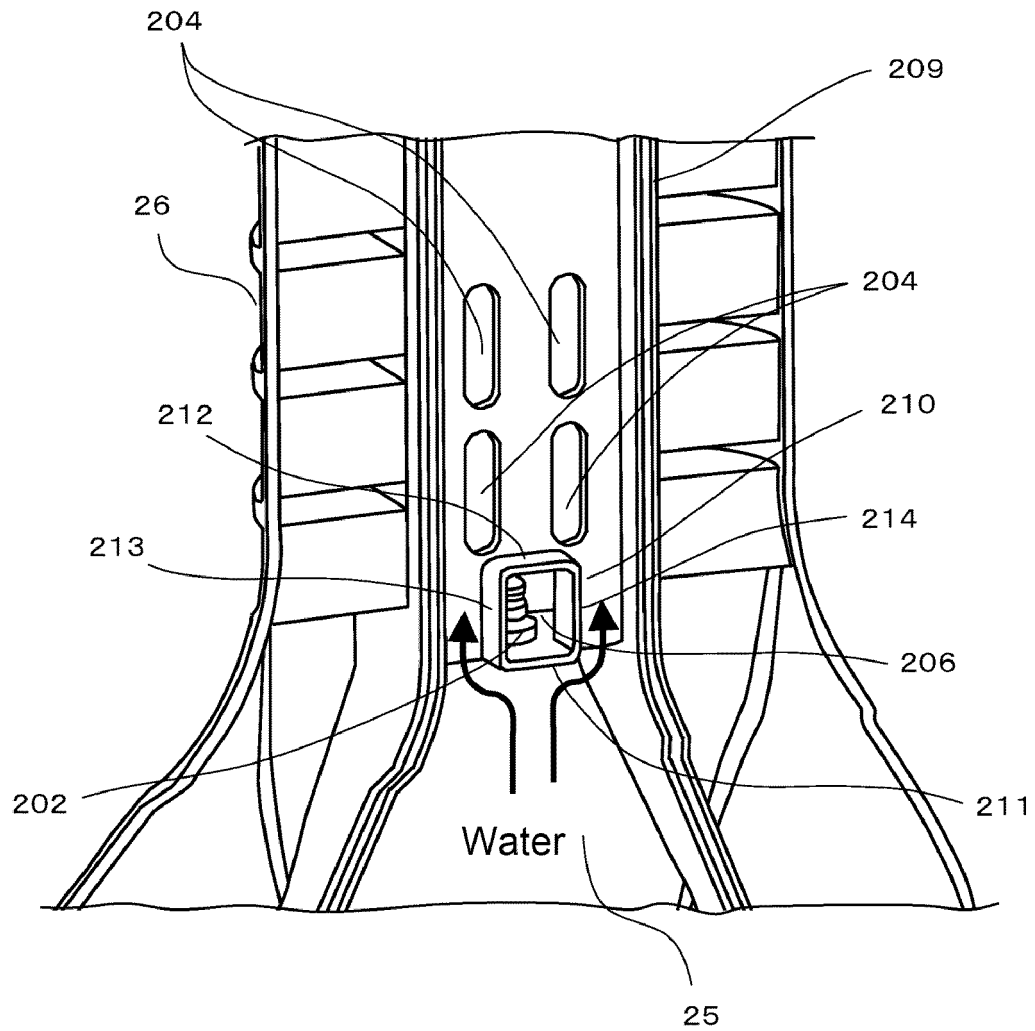


FIG. 7

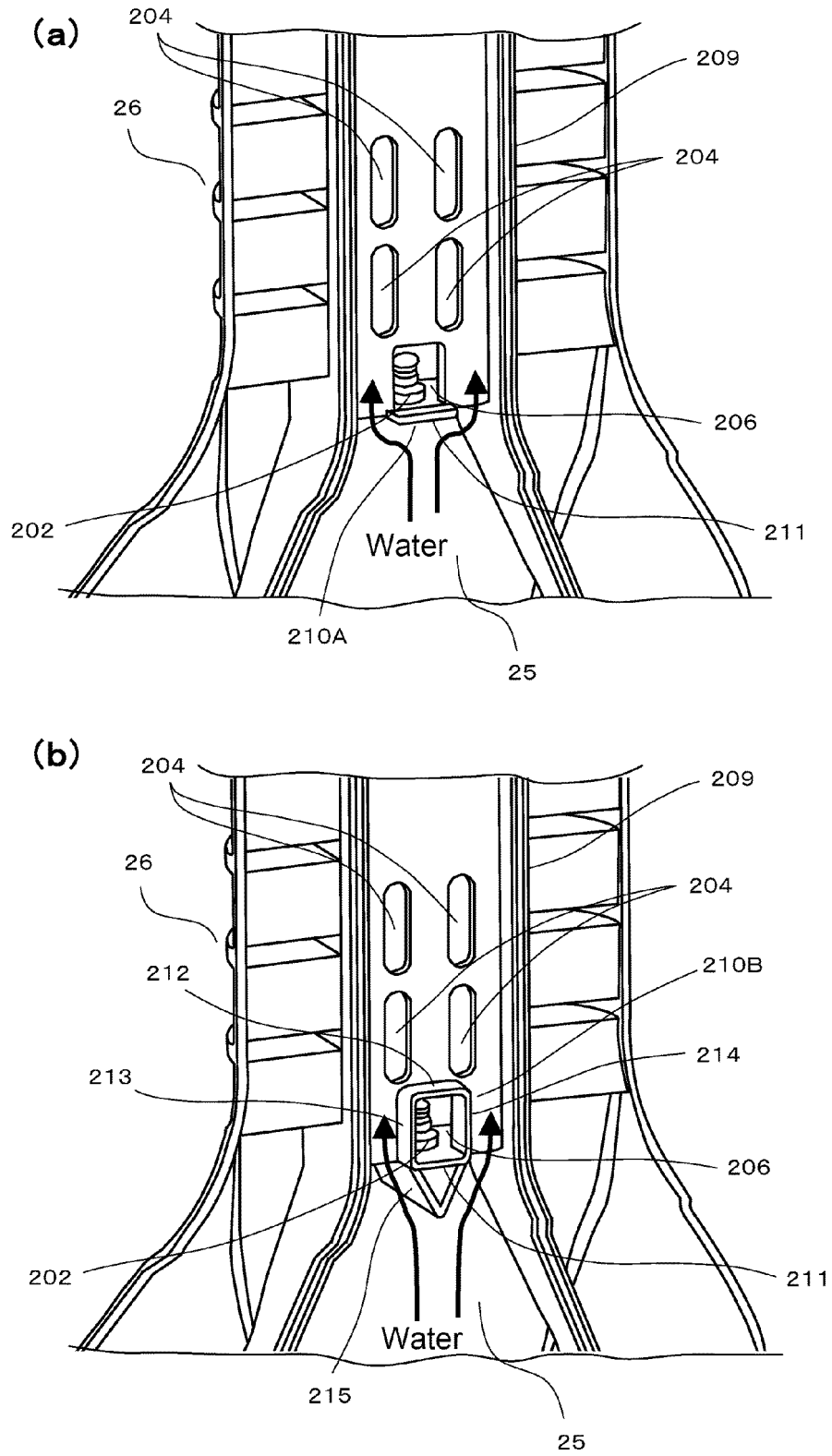


FIG. 8

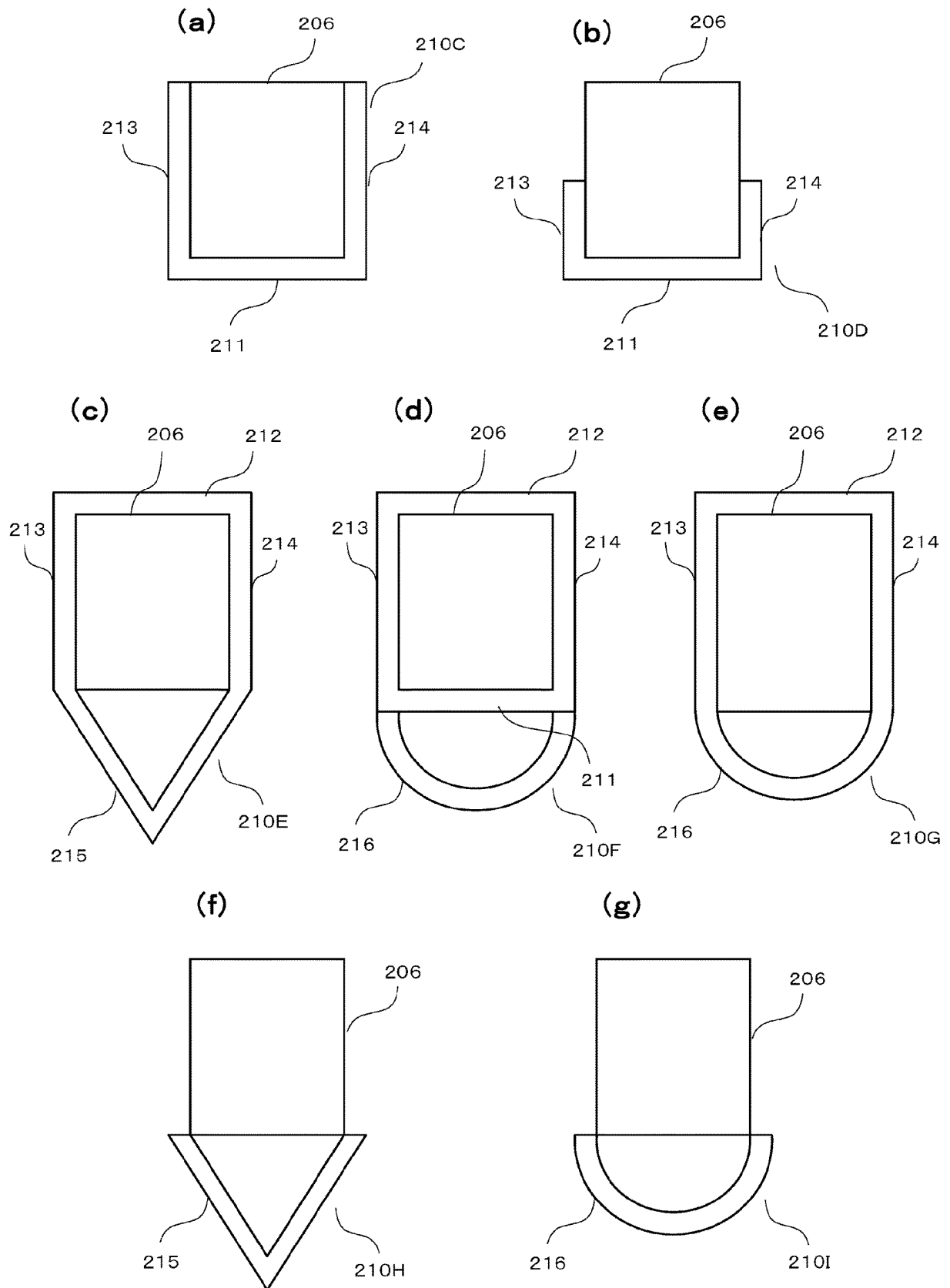


FIG. 9

(a)

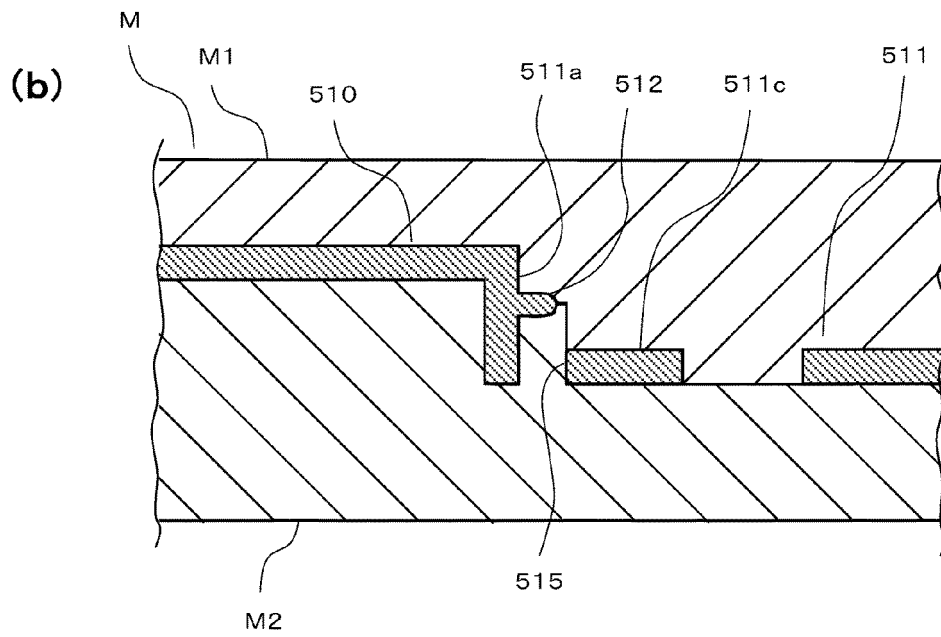
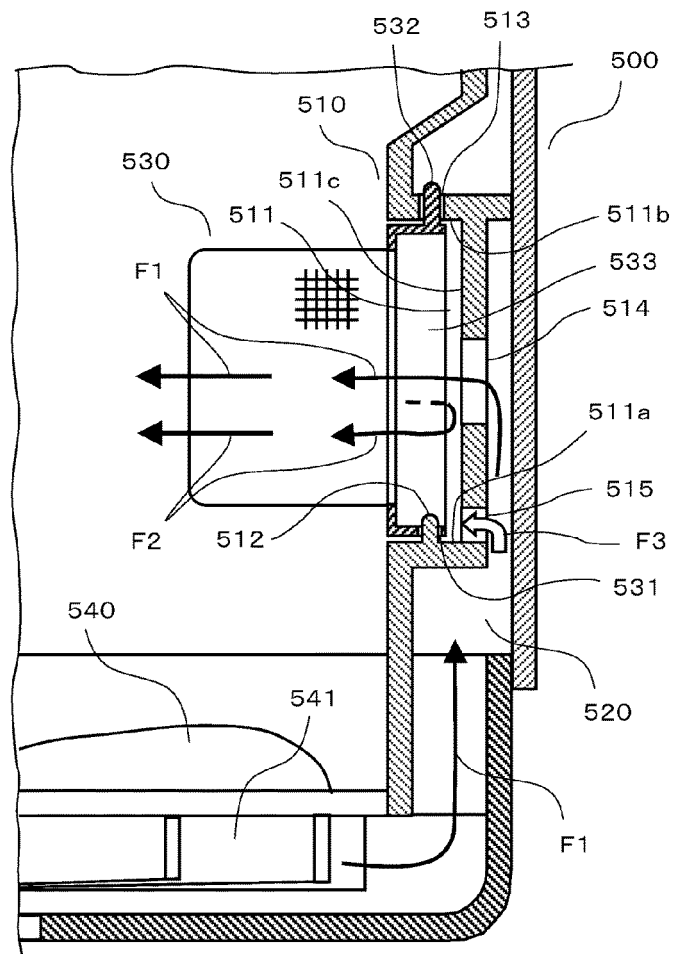


FIG. 10

REFERENCES CITED IN THE DESCRIPTION

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