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(54) Detergent drawer structure with non-integral water feed conduits, for washing machines.

(57) A detergent drawer structure for use on washing machines, in particular domestic washing machines, comprising a box casing provided with a base aperture for discharge into the washing machine tub, an element slidable in said box casing and divided into compartments for receiving detergents and means for feeding water into said compartments. The means for feeding water to the compartments are conduits which are supported by the roof of the box casing to which they are joined by coupling means, and constitute parts which are independent of said roof.

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Detergent drawer structure with non-integral water feed conduits, for washing machines.

This utility model relates to a detergent drawer structure for use on washing machines, in particular domestic washing machines, and comprising: a box casing provided with a base aperture for discharge into the washing machine tub, an element slidable in said box casing and divided into compartments for receiving detergents and possibly other substances required for the washing process, and means for feeding water into said compartments so that it mixes with the detergents or the like before reaching the tub through the base outlet.

In a particular version of this type of drawer structure, the means for feeding water into the compartments are at least partly in the form of interspaces provided in the roof or upper wall of the box casing, the water trickling from these interspaces through a plurality of small holes. To obtain these interspaces, the roof is substantially formed from a plate to which parts comprising a side spacer wall and a base wall are ultrasonically welded, this latter being provided with said plurality of small holes, from which the water trickles into the underlying compartment. This known method has two drawbacks, one of constructional nature and the other of operational nature. The constructional drawback derives from the fact that the parts have to be both welded to the roof and correctly positioned relative to each other, thus requiring not only a certain time but the use of special tools. The operational drawback results from the fact that as the water only trickles into the underlying compartments, it does not ensure complete removal of the solid detergents from the compartment.

The main object of the present invention is therefore to provide a drawer structure of the initially specified type which by virtue of the particular conformation and arrangement of its parts not only results in simplified and accelerated construction of the drawer structure, but also allows effective removal of the solid and liquid detergents from the compartments containing them by concentrating the water fed into them.

This and further objects which will be more apparent from the detailed description given hereinafter are attained in a drawer structure of the aforesaid type, in that means for feeding water to the compartments are independent conduits supported by the roof, to which they are joined by pins.

The pins can be of snap-fit, press-fit or screw type, and are inserted through holes provided in lugs rigid with the conduits and in the roof.

The invention will be more apparent from the detailed description given hereinafter by way of example with reference to the accompanying drawing, in which:

Figure 1 is a front perspective view of a detergent drawer structure shown without the compartmentalised sliding element in which the detergents or the like are placed;

Figure 2 is a plan view of the drawer structure of Figure 1;

Figure 3 is a section approximately corresponding to the line III-III of Figure 2; and

Figure 4 is a plan view of a further drawer structure.

In the figures the reference numeral 1 indicates the detergent drawer structure according to the invention used on a washing machine, preferably of domestic type. It comprises a box casing 2 open at its front an formed from a roof 3 and a part 4 provided with a peripheral side wall and to which said roof is removably connected in suitable known manner. The base is provided with a conventional outlet 7′ which leads to the washing machine tube. The drawer structure is completed by a known slidable element 5 which can be partly extracted from the box casing and is divided into compartments 6a, b, c, d in which the user places the detergents or other products necessary for the washing process, for example softeners of oxidising agents such as hypochlorites. An example of this slidable element is described and represented in Italian utility model No. 23926 B/84 filed on 29.11.1984. The compartment 6a and 6b in the slidable element 5 are filled with those measured quantities of powder or liquid detergent required for the wash and prewash respectively, whereas hypochlorite is fed into the compartment 6c and liquid softener into the compartment 6d.

A hole 7 is provided in the roof 3 in the vicinity of the inner ends of the compartments 6a, 6b. Holes 8 and 9 are also provided in the roof 3 to coincide with the compartments 6c, 6d. Holes 10 and 11, described hereinafter, are also provided in the roof. Water has to be fed to the compartments to remove the contained products to be then transferred together with these latter from the compartments to the conventional washing machine tub, not shown, through the outlet 7′.

The water is fed to the compartments 6a, 6b and 6c through a multi-branch component indicated overall by 12 and constructed of plastics by blow-moulding. The component in question constitutes an independent part which can be fixed to the roof 3 by screws, press-fit pins or snap-fit pins as explained hereinafter. In particular, said component

comprises a node 13 defining a chamber 14 provided lowerly with a tubular appendix 15 which is inserted into the ducted hole 10 in the roof 3. The component 12 comprises two substantially frusto-conical inlet conduits 16, 17 extending perpendicular to each other to converge at the node 13. Hoses 18 are mounted on said conduits 16, 17 and are connected to solenoid valves 19, 20 controlled by the conventional timer provided with the washing machine. The valves are connected to a common water offtake, not shown. The component 12 also comprises two conduits 21 extending from the node 13, each being aligned with a different conduit 16, 17. Because of this fact, when the valve 19 is open, the water which violently enters the node 12 then enters the aligned conduit 21. Likewise, when the valve 20 is open the water passes into the aligned conduit 21, if both valves 19, 20 are open, the two water streams meet in the node 13 with the result that a certain quantity of water passes into a conduit 22 provided with an initial constriction 23 and forming part of the component 12. The axis of the initial portion of the conduit 22 forms for this purpose an angle of 135° to the axes of the conduits 16, 17. A part of the water discharges from the node 13 through its base hole 15, and a part passes to the conduits 21.

The ends of the conduits 21 are passed through the holes 7 in the roof, so that they discharge into the pertinent compartment 6a, 6b.

The conduit 22 terminates in a hollow head 23a which is inserted partly into the hole 8 of the roof 3 and is provided lowerly with hole 24 which allows water to discharge into the compartment 6c.

For its connection to the roof 3, the component 12 comprises in proximity to the node 13 two holed lateral lugs 25 fixed to the roof 3 by screws, by press-fit pins, by snap-fit pins or by pins subjected to upsetting, inserted through the holes in said lugs and through corresponding seats, not shown, in the roof 3. Likewise, the head 8 comprises a holed lug 26 for connection to the roof 3.

For feeding the water to the compartment 6d, a second single-piece plastics component 27 formed by blow-moulding is provided. It comprises two hollow heads 28, 29 which are provided with a base hole 28a, b and are interconnected by a tubular portion 30 comprising a constriction 31 immediately downstream of the head 28. The two heads are partially inserted into the holes 8 and 9 of the roof. In correspondence with its two heads, the component 27 comprises holde lugs 32, 33 which enable it to be fixed to the roof 3 by screws, press-fit pins or snap-fit pins.

The component 27 also comprises a tubular connection piece 34 to which a hose 35 is connected and terminates at a solenoid valve connected to the water offtake. The solenoid valve 36 is controlled by the washing machine timer, and when open it enables water to be fed to the compartment 6d. Because of the constriction 31 and the outlet 28a upstream of it only a fraction of the water flow through the hose 35 reaches the compartment 6d. The remaining fraction is discharged through the hole 28a into the bottom of the box casing 2 and reaches the washing machine tub through the outlet 7' without flowing through the compartment 6d. In Figure 4, in which equal or corresponding parts are identified by the same reference numerals plus 100, the component 112 is identical to the component 12 and is thus designed for the same purpose. The component 27 is lacking, and a component 200 of blow-moulded plastics is added. The purpose of the component 200 is to feed hot water to the compartment when the valve is open. It consists of a tube 2 provided with holed lugs 202 for fixing to the roof 103. The component passes through the roof 103 by way of a hole 204 in this latter. The compartment 106b can thus receive either hot water by way of this component or cold water by way of the component 112.

The advantages of this utility model are:

a) ease and rapidity of essembly of the means carrying the water to the compartments;

b) concentrated water jets are obtained resulting in effective mixing with the detergents or the like contained in the compartments, and reliable removal of said products from these latter with advantage in terms both of economy and cleanliness;

c) ease of adjustment of the water throughout to be compartments by the provision of constrictions and escape paths upstream of these con strictions;

d) lightness;

e) easy maintenance.

Claims

1. A detergent drawer structure for use on washing machines, in particular domestic washing machines, and comprising: a box casing provided with a base aperture for discharge into the washing machine tub, an element slidable in said box casing and divided into compartments for receiving detergents and possibly other substances required for the washing process, ans means for feeding water into said compartments so that it mixes with the detergents or the like before reaching the tub through the base outlet, characterised in that the means for feeding water to the compartments (6a, b, c.....) are conduits (21, 27, 112, 200) which are supported by the roof (3, 103) of the box casing

(2) to which they are joined by coupling means, and constitute parts which are independent of said roof.

2. A drawer structure as claimed in claim 1, characterised in that the coupling means comprise screw pins, press-fit pins, snap-fit pins or pins subjected to upsetting.

3. A drawer structure as claimed in claim 1, characterised in that several conduits destined at least partly for different compartments (6a, 6b, 6c) form part of a single component (12, 112).

4. A drawer structure as claimed in claim 3, characterised in that the component (12, 112) comprises a hollow node (13) within which two inlet conduits (16, 17) converge at 90° to each other and two outlet conduits (21) converge at 90° to each other, each of the outlet conduits being aligned at least along its initial portion with at least the terminal portion of one of the inlet conduits.

5. A drawer structure as claimed in claim 4, characterised in that from the node (13) there emerges a further outlet conduit (22) having at least its initial portion disposed along the bisector of the angles formed by the inlet conduits (16, 17).

6. A drawer structure as claimed in claim 5, characterised in that the further outlet conduit (22) commences with a constriction (23) and terminates with a hollow head (23A) provided with a hole (24), there being provided a discharge hole (11) in the node (13).

7. A drawer structure as claimed in at least one of the preceding claims, characterised in that the outlet conduits (21, 22) pass through holes (7) or terminate in holes (8) provided in the roof (3, 103).

8. A drawer structure as claimed in at least one of the preceding claims, characterised by comprising a conduit (27) having two hollow heads (28, 29) provided with an outlet hole (28a, b) and housed in holes (9, 10) in the roof (3), one of said heads (29) communicating with a compartment (6a), a constriction (31) being provided downstream of the other head (28).

9. A drawer structure as claimed in at least one of the preceding claims, characterised by comprising a conduit (22) passing through the roof (3) and feeding a compartment (106b) which can be fed by another conduit (Figure 4).

10. A drawer structure as claimed in at least one of the preceding claims, characterised in that the component (12, 112) and the conduits (27, 200) are provided with hole lugs (25, 26, 32, 33, 202) to allow their connection to the roof (3).

11. A drawer structure as claimed in at least one of the preceding claims, characterised in that the conduits are of blow-moulded plastics.

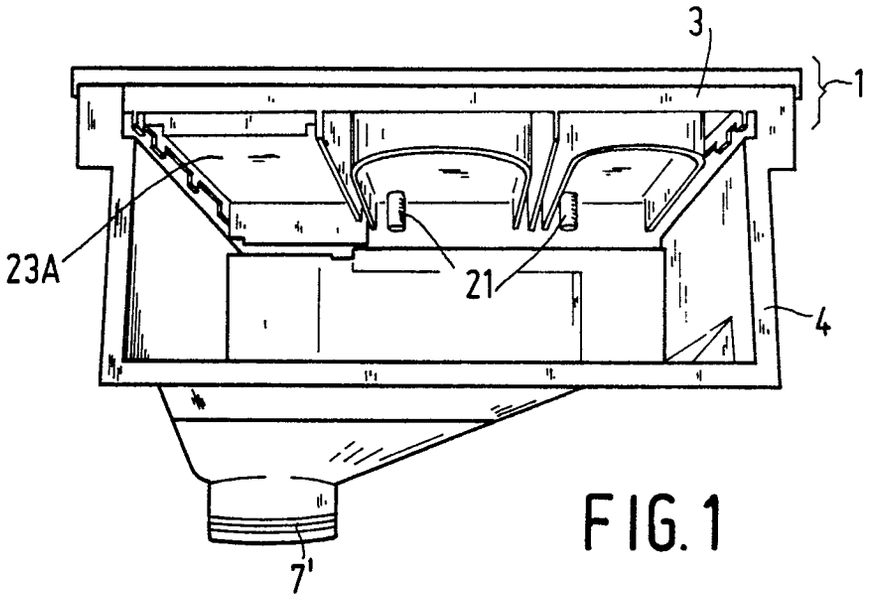


FIG.1

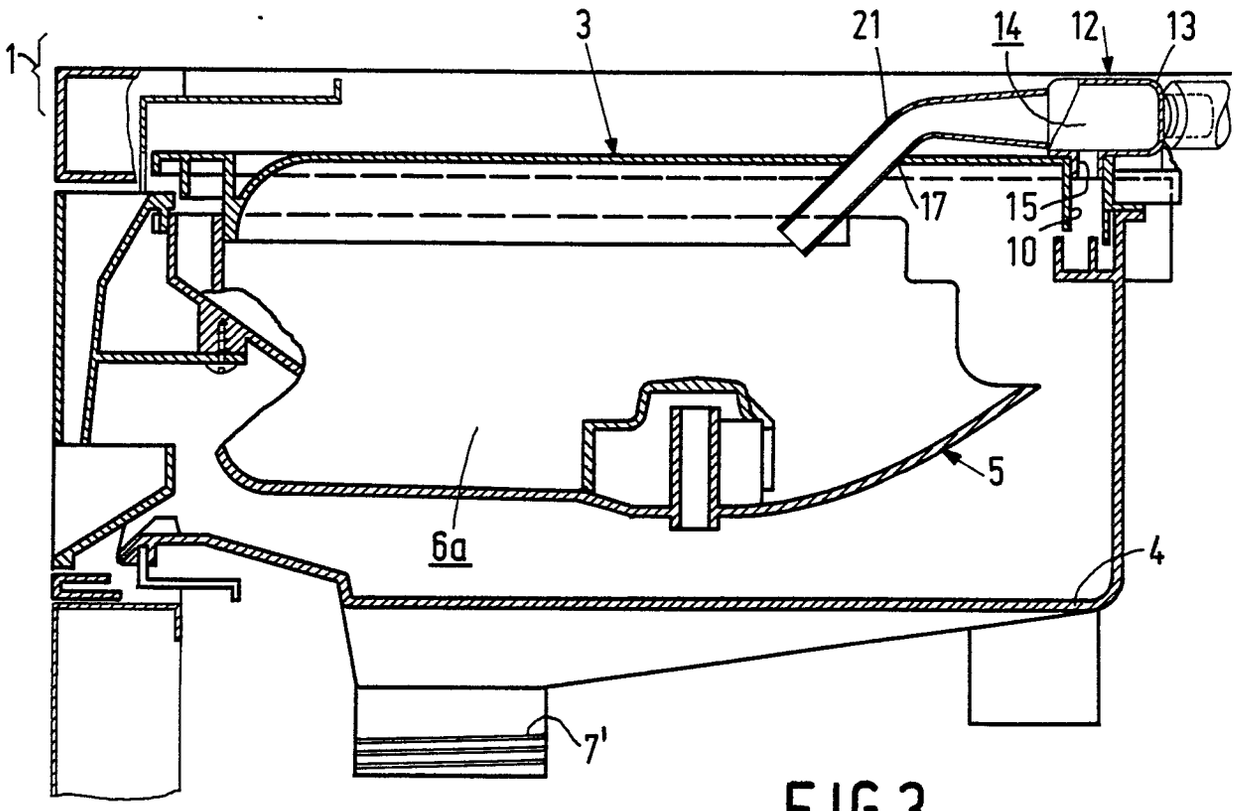
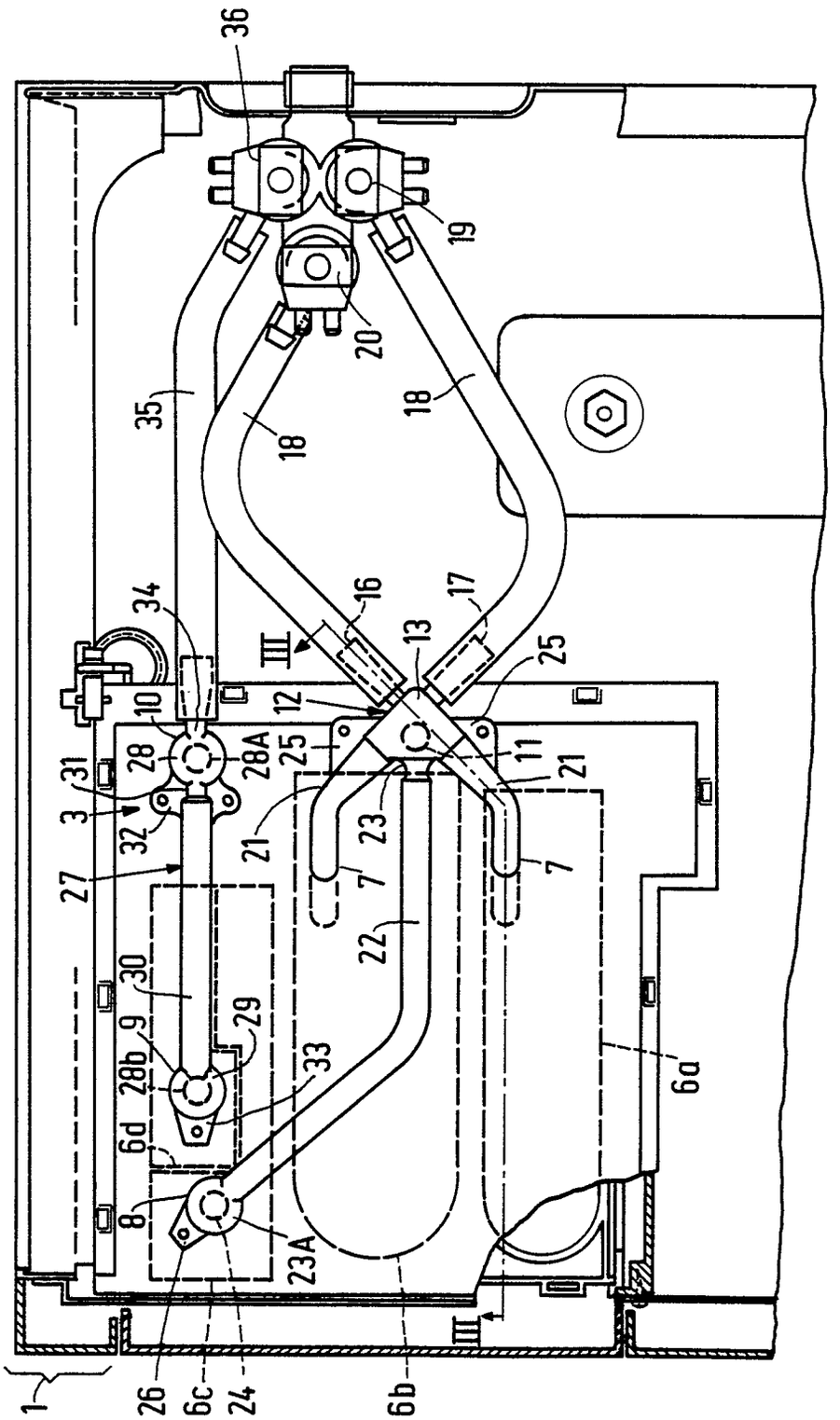


FIG.3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III
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28A
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27
7
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6d
6a
8
23A
III
1
26
6c
24
6b

FIG.2

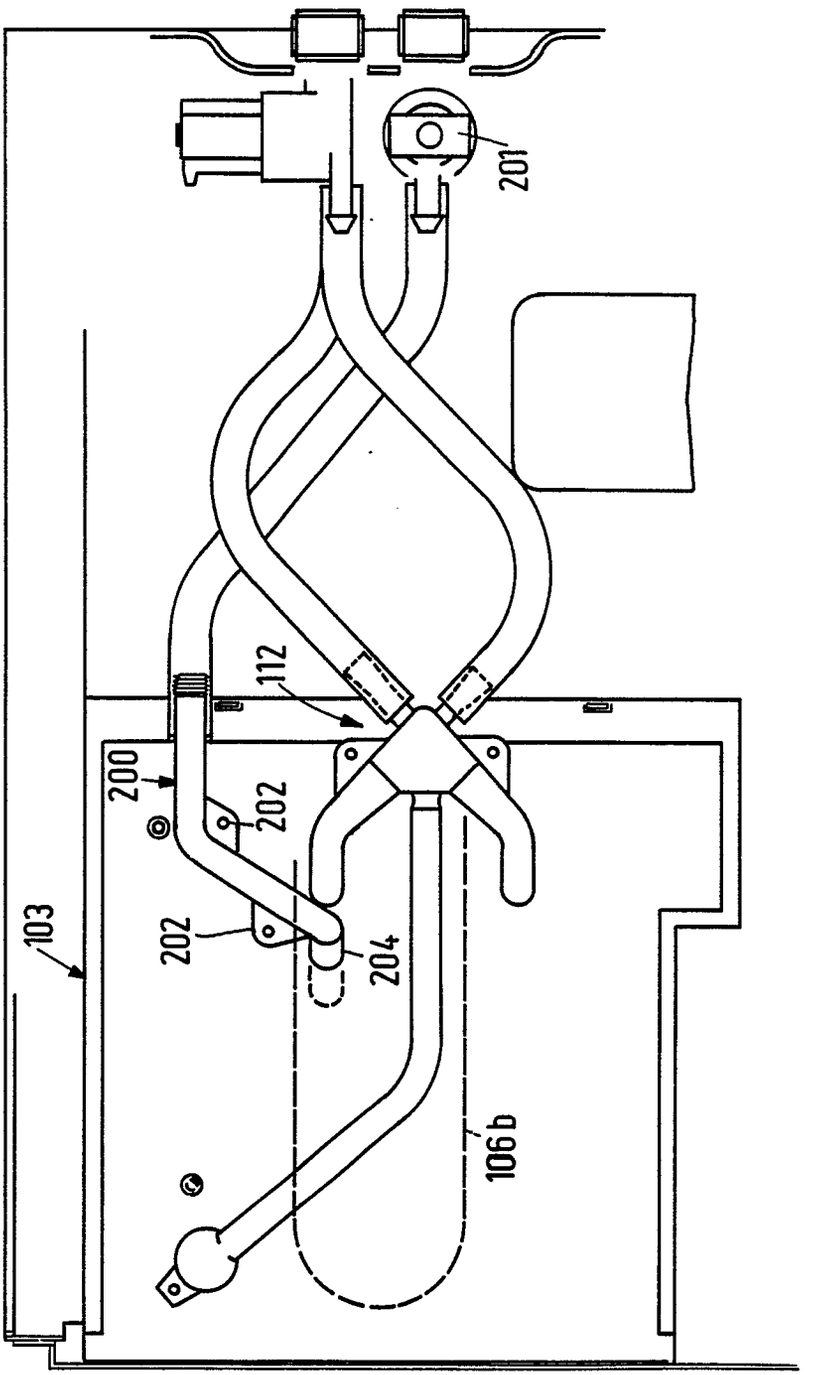

FIG.4