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(54) Laundry washing machine having a composite carrying structure.

(57) In a laundry washing machine having a tub and drum assembly supported in a housing defined by circumferential walls, a bottom member, and a top closure member, the circumferential wall of the housing is formed of two shell sections releasably connected to one another and to the bottom member. The upper portions of the shell sections are joined to one another by a cross-bracket releasably secured thereto and formed with means for suspending the tub and drum assembly from above, the top closure member being preferably formed as a working table top releasably secured to the shell sections. The bottom member carries further operating components of the machine and means for supporting the tub and drum assembly from below. Any one of the shell sections may be demounted for giving access to the operating components of the machine, the remaining shell section in this case cooperating with the bottom member and the cross-bracket to act as the carrying structure for all of the operating components.

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Description

The present invention relates to a laundry washing machine particularly of the front loading type, having a composite carrying structure which is readily demountable for giving access to the various operative components of the machine.

Known laundry washing machines of the front loading type have a housing made of varnish-coated or enamelled sheet metal forming a walled structure secured to a bottom member so as to provide three surfaces, namely, a front surface and two lateral surfaces, the rear side of such housing being open and adapted to be closed by a suitable rear panel.

The tub and drum assembly of the laundry washing machine is provided with upper suspension springs to be anchored to suitable connection points at the upper portion of the housing, and with lower vibration dampeners to be connected to the bottom member. The top of the housing is finally closed by a conventional working table top releasably secured thereto. Although laundry washing machines of the above described type operate in a satisfactory manner, they suffer from certain disadvantages resulting from the fact that the various operating components are installed at rather inaccessible locations within the housing, any access to these components being only possible after removal of the rear panel and/or the working table top, so that substitution, repair and maintenance of these components involves rather cumbersome and complicated operations.

Also known are laundry washing machines of the front loading type having a housing and a bottom member of the type descriebd above, wherein the upper portion of the tub and drum assembly is provided with suspension springs to be anchored to a planar top wall panel dimensioned to be fixedly secured to the top portion of the housing, the

,lower portion of the tub and drum assembly being supported by vibration dampeners or the like connected to the bottom member.

In still another known embodiment, the tub and drum assembly of a laundry washing machine is suspended in the manner described above from a rigid cross-bracket to be secured to the top portion of the housing, the lower portion of the assembly being again supported by vibration dampeners or the like connected to the bottom member.

These types of laundry washing machines are of simplified construction as compared to the one discussed initially, as they permit the various assemblies, e.g. the tub and drum assembly and the housing assembly, to be pre-assembled preparatory to the final assembly operation. Nevertheless these laundry washing machines suffer from the same drawbacks as the one described initially.

It is therefore an object of the present invention to eliminate the disadvantages and shortcomings of conventional laundry washing machines of the front loading type by the provision of a housing in the form of a composite carrying structrue capable of being readily assembled and demounted.

According to the invention, the housing is substantially constituted of two shell sections, namely, a front section and a rear section, to be joined to one another, and a bottom member acting as a support for the various operating components of the machine and adapted to have the shell sections releasably secured thereto.

The tub and drum assembly of the machine and the associated functional components are suspended in the described housing by upper suspension springs anchored to a single cross-bracket secured to the upper portions of the shell sections, and by an arrangement of vibration dampeners, springs or the like previously installed on the bottom member and subsequently connected to the lower portion

of the tub and drum assembly. The described construction permits to readily gain access to the tub and drum assembly and associated functional components for substitution, repair or maintenance operation by demounting one of the shell sections, the remaining shell section meanwhile carrying out the function of the carrying structure for the operating components of the machine.

According to the invention, there is thus provided a laundry washing machine, particularly of the front loading type, comprising an outer housing adapted to be closed by an upper working table top and a bottom member to be releasably connected to said housing and adapted to support the various operating components of the machine, and a tub and drum assembly including drum actuating components and the like, said assembly being suspended from above by suspension springs or the like connected to at least one cross-bracket to be secured to the housing.

A laundry washing machine of the type described above is characterized in that said housing is constituted of at least a first and a second shell section adapted to be joined to one another in an interchangeable manner, and in that said cross-bracket is adapted to be releasably secured in a per se known manner to the top portions of each of said shell sections so as to connect them to one another, said tub and drum assembly being additionally supported from below by means of vibration dampeners, springs or the like mounted on said bottom member.

The characteristics and advantages of the invention will become more clearly evident from the following description of a preferred embodiment, given by way of example with reference to the accompanying drawing, the only figure of which shows a partially sectioned exploded perspective view of a laundry washing machine according to the invention.

Shown in the drawing is a laundry washing machine of the

front loading type, comprising an outer housing substantially constituted of two unitary shell sections 1 and 2 adapted to be joined to one another in an interchangeable manner, the housing being adapted to be closed on top by a working table top 3, the shell sections 1 and 2 being adapted to be releasably connected to a bottom member 4 made of press-formed and suitably perforated sheet metal.

On the described bottom member there may be mounted various components of the machine, for instance a discharge pump 5 connected to a fluff filter 6 and to a discharge tube 7, and a support system constituted of springs 8 and of dampening pads 9 for dampening vibrations and supporting the tub and drum assembly of the machine from below. Each of the shell sections 1, 2 is in the shape of an open box formed by punching and bending of a single sheet metal blank. In particular, shell section 1 is formed with a planar center portion 10 forming the front wall of the housing, and two lateral portions 11 and 12 extending parallel to one another at right angles from center portion 10 so as to form a part of each sidewall of the housing.

Each lateral portion 11, 12 terminates in a planar vertical edge 13 and 14, respectively, provided each with a number of perforations 15, 16. Lateral portions 11, 12 and center portion 10 of shell section 1 are each provided with perforated upper rim portions 17, 18 and 19, respectively, cooperatively forming a horizontal support surface for supporting and securing working table top 3, and for additionally supporting the tub and drum assembly from above in a manner to be described.

Similar to the shell section described above, shell section 2 is formed with a planar center portion 20 forming the housing rear wall, and two planar lateral portions 21 and 22 extending parallel to one another at right angles from center portion 20 so as to form each a part of the lateral walls of the housing.

Planar lateral portions 21, 22 and center portion 20 of shell section 2 are likewise formed with planar upper rim portions 23, 24, 25, respectively, serving for the same purpose as the respective rim portions of shell section 1.

In addition, lateral portions 21 and 22 are also provided with planar vertical edge portions 26 and 27, respectively, each having a number of perforations 28 and 29, respectively, in alignment with the corresponding perforations of shell section 1 so as to permit shell sections 1 and 2 to be releasably connected to one another.

The descriebd laundry washing machine is assembled in the following manner:

A first assembly step consists in mounting the above described and/or other operating components of the machine on bottom member 4.

Subsequently bottom member 4 is secured to the lower portion of one of the shell sections of the housing, for instance shell section 2, followed by securing cross-bracket 30 to the top portion of the same shell section. Cross-bracket 30 serves as a support for anchoring the suspension springs 31, 32 of the operating assembly consisting of a washing tub 33 having a front loading opening 34, a drum (not shown) and a motor 35 for rotating the drum.

Cross-bracket 30 is formed with two forked end portions 36, 37 each having two perforate legs 38, 39 and 40, 41, respectively to be secured to one of the two shell sections 1 and 2 of the housing. Each forked end portion is additionally provided with a downwardly bent lug 42, 43, respectively, formed with a perforation for securing the lug to the respective planar portions of shell sections 1 and 2. Cross-bracket 30 may obviously be secured to the described shell sections in any other suitable manner without leaving the scope of the present invention.

The front shell section 1 may next be joined to the above described structure, followed by working table top 3 being secured to the upper portion of the thus assembled housing.

Finally, the overlapping joints of the respective planar edge portions 13, 26 and 14, 27 of shell sections 1 and 2 may be covered by suitably shaped strips (not shown) having an appearance similar to that of the shell sections and a thickness so selected that their surfaces extend flush with those of the shell sections.

A first important advantage of the laundry washing machine according to the invention results from its comprising a composite carrying structure of simple construction, permitting it to be readily assembled of pre-assembled subassemblies.

In addition, this structure greatly facilitates access to the various operating components of the machine for repair, substitution and maintenance after demounting one of the shell sections. In this case, the remaining shell section, the bottom member and the cross-bracket assume the function of the carrying structure for all of the operating components of the machine.

The possibility of demounting one of the shell sections, for instance the front shell section, additionally permits the employ of shell section having different appearance, so that different models of the laundry washing machine may be manufactured without having to employ a completely different housing for each model as at present.

A further advantage of this laundry washing machine results from the fact that the shell sections of the housing do not require any weld seams for their connection to one another, to the bottom member and to the cross-bracket, as these connections are advantageously formed by means of screws, bolts or the like.

The absence of any welded connections permits highly effective techniques to be employed for the surface treatment of the shell sections, such as a powder-coating method, or even the employ of precoated sheet metal blanks for forming the shell sections, so that the latter do not require any subsequent surface treatment, resulting in a technically and economically advantageous manufacturing process.

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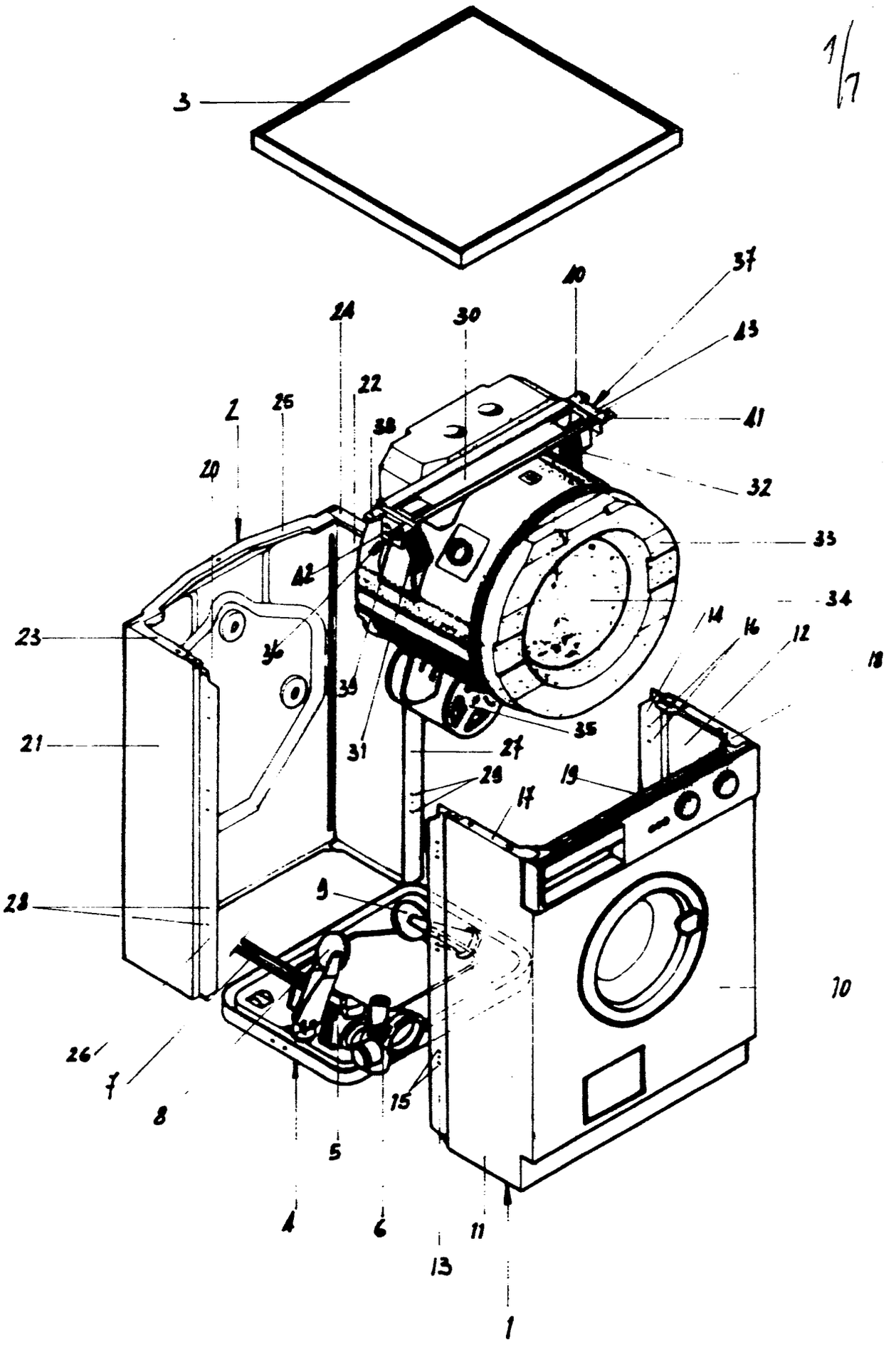
Laundry Washing Machine Having a Composite Carrying Structure

Patent Claim

A laundry washing machine particularly of the front loading type, comprising an outer housing adapted to be closed by an upper working table top and a bottom member to be releasably connected to said housing and adapted to support various operating components of the machine, and a tub and drum assembly including drum actuating components and the like, said assembly being suspended from above by suspension springs or the like connected to at least one cross-bracket to be secured to said housing, characterized in that said housing is constituted of at least a first (1) and a second (2) shell section adapted to be joined to one another in an interchangeable manner, and in that said cross-bracket (30) is adapted to be

releasably secured in a per se known manner to the top portions of each of said shell sections (1, 2) so as to connect them to one another, said tub and drum assembly being additionally supported from below by means of vibration dampeners, springs or the like mounted on said bottom member.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