BACKGROUND OF THE INVENTION

This invention relates, in general, to top loading type washing machines and, more particularly, to an inertia weight and structure for mounting the weight to the non-rotating tub of the machine.

The type of inertia weight herein contemplated comprises a preformed brick or concrete block which is to be utilized in lieu of the commonly employed concrete weight which is fabricated by pouring concrete into a mold after the latter has been attached to the tub. By using the preformed weight it is possible to eliminate expensive assembly delays inherent in the aforementioned procedure.

It is well known that brick and concrete structures are high in compressive strength and very low in tensile and bending strength. Consequently, any apparatus for mounting of the brick or block must provide uniform pressures between mating surfaces. Due to the vibrations and high inertia forces resulting from spinning of unbalanced loads in a washing machine the pressures developed between the mounting apparatus and the brick or blocks are quite large, accordingly, any lack of uniform contact between mating surfaces is quite critical.

Accordingly, it is the general object of this invention to provide a new and improved washing machine of the top loading type.

It is a more particular object of this invention to provide a new and improved inertia weight and structure for mounting the weight on the non-rotating tub of a top loading type washing machine.

Another object of this invention is to provide apparatus for mounting an inertia weight in a top loading washing machine, which apparatus applies uniform compressive forces to the weight and uniform contact between the weight and the apparatus.

Still another object of this invention is to provide a structure for mounting an inertia weight onto a top loading washing machine, the structure comprising means for selecting a predetermined weight for the weight, and means for expanding the weight to the desired predetermined weight.

Yet another object of this invention is to provide a new and improved inertia weight and structure therefor which can be inexpensively manufactured and which results in minimizing expensive time delays in assembly.

DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a side elevational view, partly broken away and in section, of a top loading washing machine representing the invention;

FIG. 2 is a fragmentary view of a non-rotating tub with an inertia weight attached thereto;

FIG. 3 is a cross-sectional view taken on the line III—III of FIG. 2; and

FIG. 4 is a perspective view of a bracket forming a part of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1 of the drawings, a washing machine shown therein comprises a cabinet 10 and an operating unit 11 disposed inside the cabinet. The cabinet 10 may be of the usual construction having a cover 12, side walls 13 and a bottom wall 14. Adjustable feet 15 are provided in the bottom wall 14 for supporting the cabinet on a floor or base 16. The bottom wall 14 has an integrally formed dome portion 17 for a purpose which will be described hereinafter.

The operating unit 11 comprises a frame 21, a non-rotatable tub 22 supported by the frame 21, a spinner basket 23 rotatably mounted inside the tube 22, an agitator 24 disposed inside the spinner basket 23, a transmission gear unit 25, a motor 26, a pump 27 and a clutch 28. The frame 21 comprises a base 31 and three upwardly and outwardly extending braces 32, one of which is shown in the drawings. The braces 32 are disposed 120° apart. The base 31 includes an inverted cup portion 30 which rests upon the dome 17 to pivotally support the operating unit in the cabinet. A ring of friction material 33 is disposed between the dome 17 and the cup 32.

The oscillating movement of the operating unit on the dome 17 may be limited by a pin 34 which extends through an enlarged opening 35 in the top of the dome 17 and is secured in a boss 36 on the cup 32. Three centering springs 37 are connected between the bracing members 32 and the bottom wall 14 of the cabinet to bias the operating unit 11 to an upright position in the cabinet. The tension of
the springs 37 may be adjusted by means of threaded hooks 38 extending through the brace members 32.

The motor 26 may be attached to the supporting frame 21 by any suitable means, such as a bracket (not shown). One end of the motor shaft is connected directly to the pump 27 to drive the pump and the other end of the motor shaft is connected to the transmission unit 25 through the clutch 41 and 42 and gear 43.

The transmission gear unit 25 is attached to the brace member 32 of the frame by arms 44 which extend from the lower portion 45 of the gear unit housing. The gear unit 25 drives the agitator 24 through a shaft 46 which is disposed inside a hollow shaft 47. The agitator 24 is supported by the shaft 46 and is attached thereto by means of a cap screw 48.

The hollow shaft 47 extends from a bearing housing 51 of the gear unit which extends through the bottom of the tub 22. The shaft 47 drives the spinner basket 23 which is supported by a hub portion 52 secured to the shaft 47. The tub 22 is attached to the brace members 32 by extension members 53.

In accordance with the usual practice the agitator 24 is oscillated back and forth by the gear unit during the washing operation. During the spinning or centrifuging operation the spinner basket 23 is rotated at a relatively high speed to extract liquid from the clothes by centrifugal force.

In order to reduce the amplitude of gyrations of the operating unit 11 about its pivotal support during the spinning operation, an inertia weight 55 is rigidly attached to the non-rotating tub 22. The weight 55 constitutes a preformed brick or concrete block as shown in FIG. 3, has a substantially triangular cross section and has an arcuate wall 56 which conforms to the shape of the tub 22.

The weight 55 is attached to the tub 22 by means of a pair of spaced apart brackets 57 which are spot welded or otherwise suitable fastened to the tub 22 at locations indicated at 58 and 59. Each bracket comprises a vertical member 61 and a substantially horizontal member 62, the former of which has a shape complementary to the tub 22 and is secured to the tub. The horizontal member 62 has a frusto-conical portion 63 and a flat washer portion 64, the portion 63 having an aperture 66 for insertion of an elongated bolt 67. The weight 55 is provided with a longitudinal bore 68 permitting mounting of the weight on the bolt 67. Each segment of the washer portion 64 closest the vertical member 61 is separated from the member 61 by an arcuate slot 69 thereby minimizing the area of connection between the washer and the rest of the horizontal member 62. The washer portion 64 is offset from the rest of the horizontal member 62 such that the washer occupies a depressed position. This insures that only the washer 64 contacts the end 71 of the weight 55.

A nut 72 fits the lower end of the bolt 67 and serves to tighten the washers 64 down on the ends 71 of the weight 55. Whatever the longitudinal dimension of the weight the washers will assume the necessary angle to provide intimate and uniform contact between the undersides 73 of the washers 64 and the surfaces of the ends 71 of the weight 55.

Since numerous changes may be made in the above-described apparatus and different embodiments of the invention may be made without departing from the spirit thereof, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. In a washing machine, in combination, an operating unit disposed inside the cabinet, said unit comprising: a frame; a non-rotatable tub supported by said frame, a spinner basket rotatably mounted inside said tub, an agitator disposed inside said spinner basket, a transmission unit supported by said frame, a motor for driving the agitator and the spinner basket at different speeds through the transmission unit, means for pivotally mounting the frame in the cabinet, centering springs biasing the operating unit to an upright position, a preformed weight having one wall thereof having a configuration conforming to the contour of the outer wall of said non-rotatable tub, and means for attaching said weight to said non-rotatable tub at a location adjacent the top thereof and directly opposite the position said motor occupies relative to said tub.

2. Structure as specified in claim 1, wherein said attaching means comprises; a pair of spaced apart L-shaped brackets secured to said tub and an elongated bolt and nut therefor; said bolt being insertable through said brackets and a longitudinal bore through said weight when said weight is disposed between corresponding members of said brackets.

3. Structure as specified in claim 2, wherein said corresponding members each comprises a flat washer portion and a frusto-conical portion, the former of which is adapted to contact the frame, and the latter of which is adapted to contact the spin basket and the complement of the portion of the frame to thereby minimize the area of connection between the washer portion and the rest of the horizontal members whereby the washer portion can assume the necessary angle to provide intimate and uniform contact between the washer and the end surface of the weight regardless of its dimension as long as it is within predetermined tolerances.

4. Structure as specified in claim 3, wherein said corresponding members are substantially horizontally disposed and are provided with arcuate slots intermediate the flat washer portion and the complementary portion of the frame to thereby minimize the area of contact between the washer portion and the rest of the horizontal members whereby the washer portion can assume the necessary angle to provide intimate and uniform contact between the washer and the end surface of the weight regardless of its dimension as long as it is within predetermined tolerances.

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