Jan. 2, 1940. C. K. SKINNER 2,185,821

WASHING MACHINE

Filed April 15, 1937

Fig. 1.

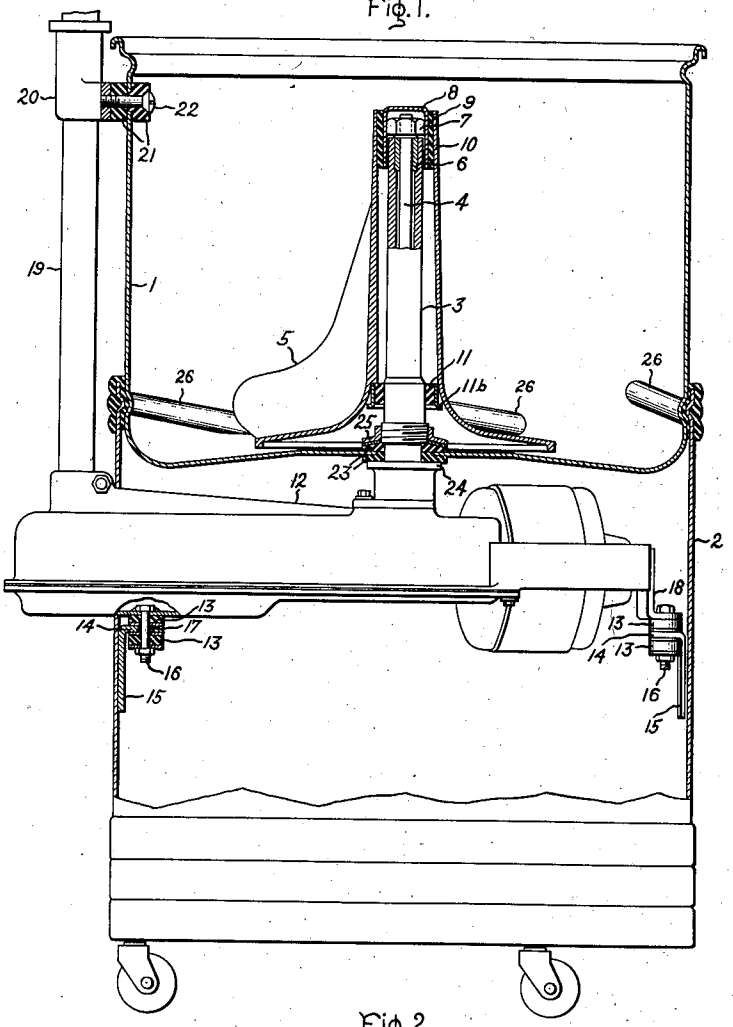
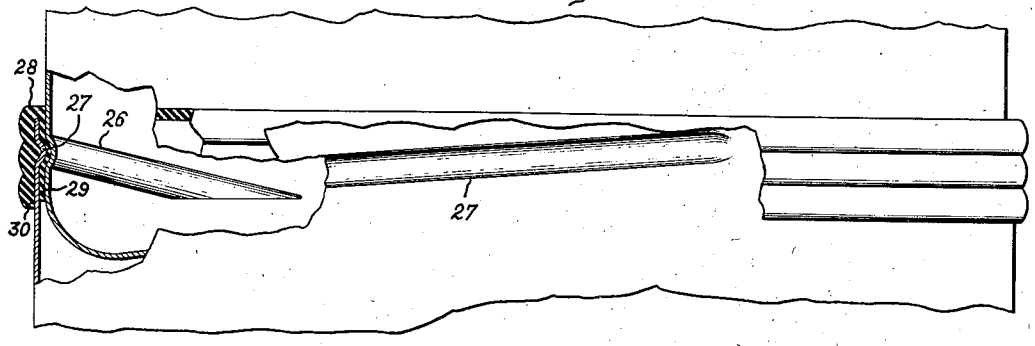


Fig. 2.



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WASHING MACHINE

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Application April 15, 1937, Serial No. 137,054

1 Claim. (Cl. 220—69)

The present invention relates generally to domestic washing machines of the type in which washing is effected by the oscillatory movement of an agitator or like member mounted within the tub.

The object of my invention is to provide an improved construction in washing machines wherein the tub is secured on the support in a simple and effective manner and for a consideration of what I belive to be novel and my invention attention is directed to the following description and claim appended thereto.

In the accompanying drawing,

Fig. 1 is a sectional elevation of a washing machine embodying my invention.

Fig. 2 is a fragmentary elevation, partly in section of the tub and support in assembled position.

Referring to the drawing, the tub 1, which may be made of relatively light sheet metal coated with enamel, is fastened in a manner hereinafter described to the upper part of a cylindrical sheet metal skirt 2 which serves as a support for the tub. A tubular sleeve or post 3 extends through a central opening in the bottom of the tub upwardly to a point above the normal water level in the tub. A vertical shaft 4 for driving an agitator 5 extends upwardly within the post 3 and is journalled at the upper end thereof in a bearing 6. The coupling between the shaft and the agitator comprises a nut 7 fixed to the upper end of the shaft which fits into a complementary metal socket 8 molded to the inner surface of a rubber sleeve 9. The outer surface of the sleeve 9 is secured to the inner surface of the tubular portion 10 at the upper end of the agitator. The sleeve 9 provides a resilient support for the agitator and also provides a torsionally resilient driving connection between the oscillatory shaft 4 and the agitator. This driving connection decreases the shock resulting from the sudden reversal of the agitator, with the result that noise caused by play in the oscillating mechanism is decreased. Since the upper end of the socket 8 is closed, leakage is prevented around the shaft 4 of the water which is splashed over the upper end of the agitator.

At the lower end of the agitator is an annulus 11 of rubber bonded to a metal ring 11b, which is secured to the agitator. The annulus 11 bears on the outside of the post 3 and provides a resilient bearing for guiding the agitator. The bearing prevents noise due to wobbling of the agitator with respect to the post 3. The rubber bearing 11 has very low friction with water lubrication and has the further advantage that it is not harmed by particles of grit in the washing solution.

The lower end of the post 3 is bolted to the upper side of the gear casing 12 containing the driving mechanism for oscillating the agitator shaft. To prevent transmission of noise originating in the gear casing to the tub and the skirt 2 which serves as the tub support, there is provided a resilient mounting for the gear casing for preventing metallic contact between the gear casing and any part of the tub or skirt. This mounting comprises rings 13 of rubber, or other resilient material, which are arranged on either side of a flange 14 of a bracket 15 secured to the skirt 2. The parts are held in assembled relation by a bolt 16 extending through the rings 13. One end of this bolt 16 is fixed to the gear casing cover plate. A clearance hole 17 in the flange prevents metallic contact between the bolt and the flange. A resilient support of this construction is provided between the skirt 2 and each end of the gear casing. At the left end of the gear casing the resilient support is located between the gear casing cover and the skirt. At the right end of the gear casing the resilient support is located between a bracket 18 and the skirt.

In order to prevent transmission of noise from the gear casing through the wringer post 19 which is fixed in the gear casing, I have provided a similar resilient mounting between the tub and collar 20 which is adapted to support a wringer. This mounting comprises pads 21 of resilient material which are arranged on either side of the tub and which are held in place by screws 22 threaded through clearance holes in the tub into the collar.

A resilient mounting is also provided between the post 3 and the bottom of the tub. This mounting comprises rings 23 of resilient material which are arranged on either side of the tub and which are clamped between the flange 24 on the post 3 and a nut 25 threaded on the post. The rings 23 also serve as a water-tight seal. In order for the resilient connection between the post and the bottom of the tub to be effective in preventing the transmission of vibration and noise the tub is supported upon the skirt 2 so that the weight of the tub and contents will not be transmitted through the resilient rings 23 to the gear casing.

In the supporting arrangement for the tub, the inside diameter of the skirt is made slightly larger than the outside diameter of the tub so

that the tub may be fitted into the upper portion of the skirt which acts as the support. For securing the tub to the skirt, the tub is provided with a plurality of circumferentially spaced apart grooves 26 in the side walls extending upwardly from the lower edge thereof in a spirally arranged configuration. Similarly, spaced and arranged ribs 27 are provided in the upper portion of the skirt for cooperative engagement with the grooves 26 formed in the tub. By placing the tub onto the skirt, aligning the grooves of the one with the ribs of the other and by moving the tub rotationally with respect to the skirt, the ribs will engage with grooves rigidly fastening the two parts together. Relative movement between the two parts tending to separate them is prevented by fastening the wringer post 19, which extends from the gear casing to the tub, as shown in Fig. 1.

To prevent a metallic contact between the tub and the skirt, a strip of non-metallic or sound deadening material 28, such as rubber, is placed between the inter-fitting portions. This strip, which may be preformed in the manufacture thereof in a cross-sectional U-shape, as shown in Fig. 2, is fitted over the edge of the skirt before the machine is assembled. One side 29 of the strip extends downwardly on the inside of the skirt over the ribs while the other side 30 extends downwardly concealing the grooves on the outer surface of the skirt. Since the edge of the skirt is covered by the strip, the danger of chipping of the enamelled surface of the tub during the assembling operation is lessened. It is understood, of course, that if such a strip is to be used between the tub and the skirt, the relative diameter of these parts must be such as to allow sufficient clearance between them for such strip. It is to be desired however, that the amount of clearance be only such that in the assembled machine the tub is comparatively rigidly held in the skirt as though the strip were omitted.

A further advantage in the use of the strip is that in the assembled machine the sharp edge of the skirt is covered, which is very desirable. The strip also provides a seal which prevents water which may flow down the outside of the tub from leaking between the tub and the skirt. In addition, the grooves in the outer surface of the skirt are covered by the portion 30 of the strip which may be more readily cleaned and presents a smooth and pleasing appearance. Also, since the portion projects beyond the annular surface of the machine it may act as a buffer to protect the finish of the machine during the handling thereof.

Although I have shown and described the grooves as being in the outer surface of the tub, and cooperating ribs as being on the inner surface of the skirt, it is obvious that the ribs could be placed on the tub and the grooves in the skirt without departing from the spirit of my invention.

By my invention I provide a rigid connection between the tub and the skirt so that the machine may be moved without exerting any force upon any of the resilient mountings, nor is any of the weight of the tub and contents transmitted to the support through any of the resilient mountings to impair their effectiveness as such while the machine is in use.

No claim is made to the resilient mounting for the gear casing and agitator, this being claimed in application Serial No. 100,850, filed September 15, 1936.

What I claim as new and desire to secure by Letters Patent of the United States, is:

In a washing machine, a sheet metal tub, a cylindrical sheet metal support into which the lower portion of said tub is adapted to fit, means in said interfitting portions for fastening said tub to said support comprising spirally arranged and circumferentially spaced apart semicircumferential grooves in one part and ribs in the other part, and a yieldable strip covering the upper edge of said support and extending downwardly therefrom on both sides thereof, the inner side of said strip being gripped between said ribs and grooves of said support and said tub.

CHARLES KOUNTZE SKINNER.