Jan. 4, 1944. S. WALLACE 2,338,150

WASHING MACHINE

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Fig. 1

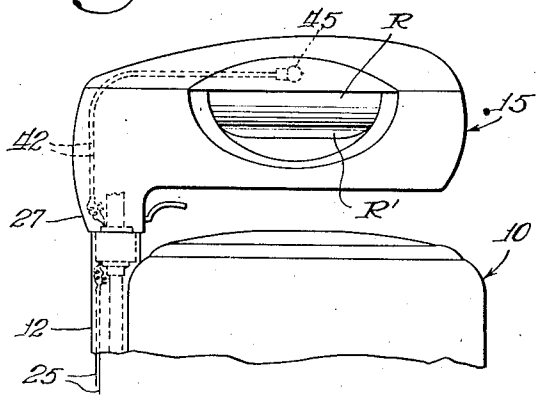


Fig. 3

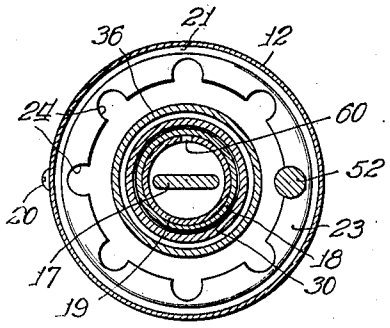


Fig. 5

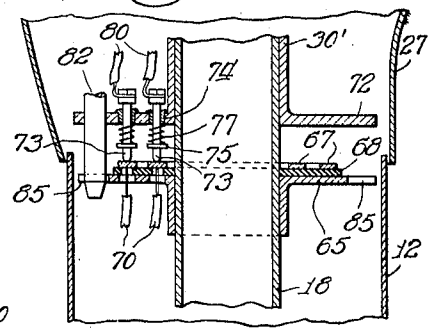


Fig. 2

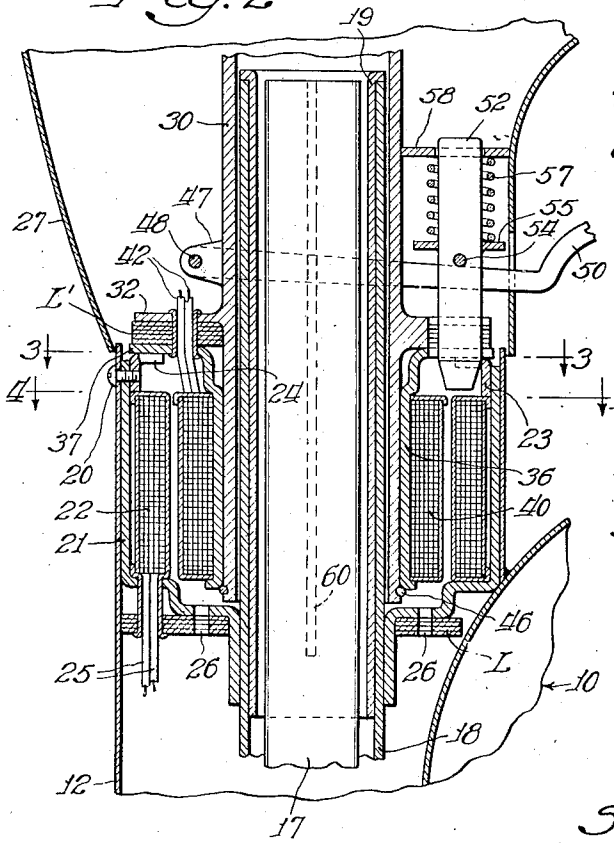
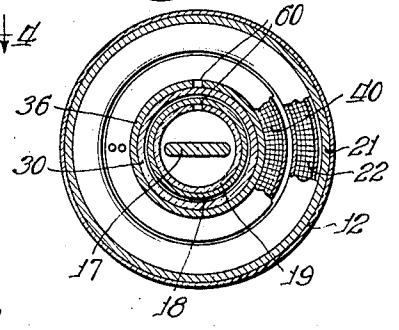


Fig. 4



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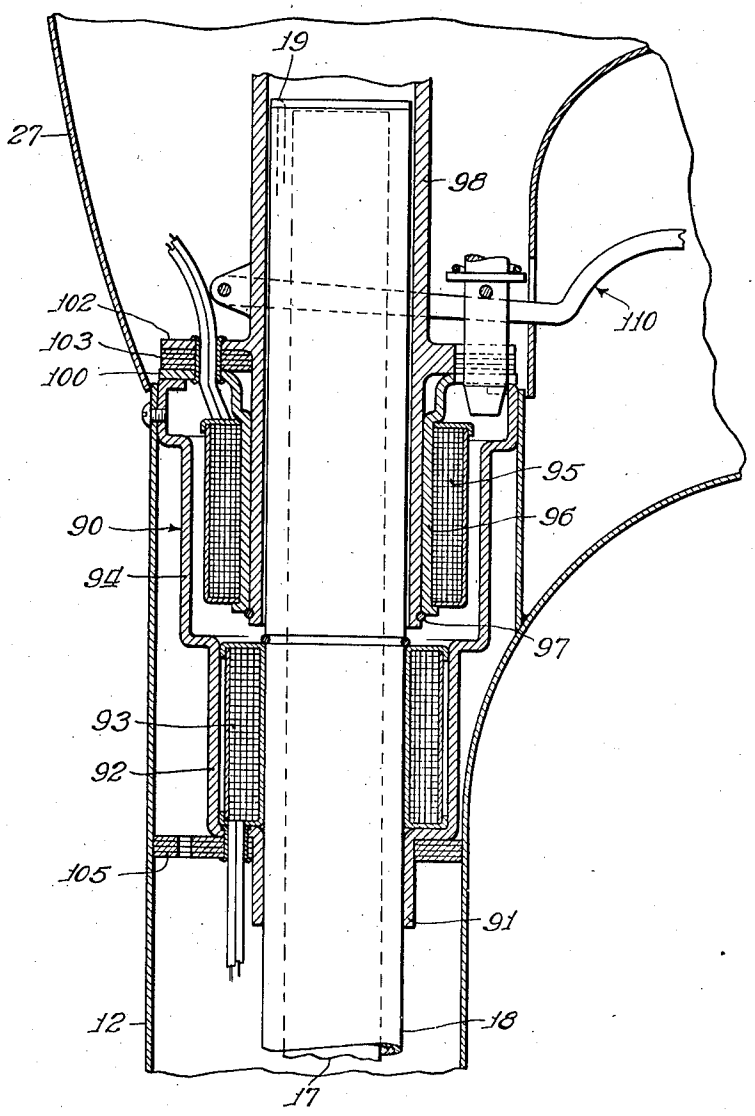
Atty.

Jan. 4, 1944. S. WALLACE 2,338,150

WASHING MACHINE

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Fig. 6



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UNITED STATES PATENT OFFICE

2,338,150

WASHING MACHINE

Stanley Wallace, Chicago, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill., a corporation of New York

Application September 12, 1941, Serial No. 410,508

10 Claims. (Cl. 68—3)

My invention relates to machines wherein mechanical power and electrical power are transmitted from one part to a part rotatably connected thereto, and has to do more particularly with washing machine and wringer combinations wherein the wringer is detachable from the washer and is designed for rotation about a vertical axis, preferably throughout a complete circle, from positions over the washer tub to positions outside thereof.

It has been found highly desirable in washing machines of the type herein referred to, to provide certain electrical devices in the wringer portion, such as a lamp for illuminating either the wringer rolls themselves or for illuminating the contents of the washer tub; a warning light to indicate the operative condition of the wringer; or possibly a lamp irradiating ultra violet light for sterilizing the laundered articles either in the tub or passing through the wringer.

In the past, the provision of such electrical devices in the wringer has been a source of considerable difficulty and danger. Inasmuch as the usual house current is of at least 110 v., the provision of electrical devices in an element which is subjected to frequent movement and vibration, such as a wringer, is a source of considerable physical hazard to the operator, whose hands are usually wet and who is usually grounded by reason of wet feet and floors.

An object of my invention is to provide a machine comprising a fixed part and a part rotatably connected thereto and readily demountable therefrom, with means for transmitting mechanical and electrical power therebetween and requiring no special connection or disconnection.

Another object of my invention is to provide a combined washing machine and wringer having electrical transmission means from the washer portion to the wringer portion which will permit ready detachment of the wringer from the washer proper, as for shipment, etc., without attention to electrical connections.

Another object is to provide a combination of the type referred to wherein the electrical energy fed to the machine is stepped down, before it reaches the wringer portion, to a voltage which will be harmless to the human body. According to one preferred embodiment of my invention, a transformer is used at the junction between the wringer portion of the machine and the tub portion or washer proper, while in another embodiment a transformer is employed at a point in the course of the current in advance of said junction.

Still another object is to provide an electrical arrangement of both types referred to which will permit rotation of the wringer portion through a complete circle, with locking means for fixing the wringer portion in any desired angular position.

Still another object is to provide devices of the type referred to which will be simple in construction, economical to fabricate, substantially wear proof and fool proof in operation, and which, in general, are thoroughly satisfactory for the purposes desired.

Various objects and advantages will, no doubt, suggest themselves to those skilled in the art as the description proceeds.

Referring now to the drawings forming a part of this specification and illustrating preferred embodiments of my invention,

Fig. 1 is a fragmentary elevational view of one embodiment of my invention, showing a combined washing machine and wringer to which my invention is applied;

Fig. 2 is an enlarged detailed sectional view of the connection between the wringer portion and the tub of Fig. 1 and showing the electrical transmission between said parts;

Figs. 3 and 4 are sectional views taken along the lines 3—3 and 4—4, respectively, of Fig. 2; and

Figs. 5 and 6 are sectional views, similar to Fig. 2, of other embodiments of my invention.

Referring first to Fig. 1, numeral 10 illustrates generally the tub of a washing machine having a hollow post 12 alongside thereof, said post serving as a housing for transmission of mechanical and electrical power from the washer portion of the combination to the wringer portion indicated generally by the numeral 15. A common source of power is provided for the washer and wringer, such as an electric motor (not shown), and the mechanical power is transmitted by means of a bar 17 extending axially within a tubular element 18 disposed within the post 12, which detachably engages suitable mechanical elements (not shown) in the wringer portion 15 for transmitting motion to the wringer rolls R, R'. A sleeve 19, serving as magnetic core mass, is secured within the upper portion of the tube 18 and is flanged over the top thereof, as seen in Fig. 2. Since these mechanical elements form no part of my invention, it is not considered necessary that they be shown or described in greater detail.

Disposed within the upper portion of the post 12 and secured thereto as by screws 20, or the

like, is a cup-shaped element 21 which may be formed of any suitable magnetic material, such as steel, this cup having mounted therein an annular primary transformer coil 22 which receives its energy through conductors 25 from any suitable source, such as an ordinary house lighting circuit. The cup 21 has secured to the upper portion thereof an annular member 23 provided with a plurality of uniformly spaced apertures 24 for angularly adjusting the wringer portion, as will hereinafter be more fully described. Secured below cup 21 is a plurality of annular laminations L of magnetic material, the cup and laminations having a plurality of perforations 26 for drainage and ventilation purposes.

The wringer portion 15 includes a depending, more or less cylindrical shell portion 27 which cooperates with the post 12 to form an upward extension thereof and serving as a housing for mechanical and electrical transmission elements. Extending within the shell 27 is a tubular element 30 having an annular flange 32, to the lower face of which flange are secured a plurality of annular laminations L' of magnetic material, such as soft iron. A sleeve-like member 36 is fixed to the tubular member 30 and has an outwardly extending flange 37 disposed below and retaining the laminations L', the sleeve 36 having arranged thereon an annular secondary coil 40, conductor elements 42 serving to convey the induced electrical energy from said secondary coil to any desired electrical element carried by the wringer portion, such as a lamp 45. However, as stated above, my invention may be utilized in connection with any desired electrical element to be carried by the wringer portion, such as a pilot or warning light, sterilizing lamp, etc. The secondary coil 40 is designed to be capable of nesting conveniently within the primary coil 22, and rests on a snap ring 46 seated in sleeve 30.

The detailed construction of the transformer coils need not be shown, inasmuch as these elements may follow known principles. I prefer that these coils be so wound that the electrical energy is stepped down to approximately 6 v., as carried by the conduits 42. It will be seen that certain members ordinarily serving a purely mechanical function (such as post 12, ring 23 and tube 18) have been supplemented by additional members such as cup 21, sleeve 19, flange 37 and laminations L and L' to provide a mass of magnetic material to induce the magnetic flux to flow in a path through it, similar to the core in a conventional transformer. This voltage is approximately that carried by an ordinary pocket flashlight and is so low that even a child coming into contact therewith would receive no substantial shock.

For the purpose of adjusting the wringer portion 15 angularly with respect to the washer portion 10, a lug 47 is provided on the tube 30, which provides a pivot 48 for a manipulating lever 50 which acts on an indexing pin 52 which seats alternatively in any of the apertures 24 of the ring 23. The pin 52 has formed thereon a stud 54 against which the lever 50 reacts and an annular flange 55 which reacts against a helical compression spring 57 retained by an annular element 58 secured on the tube 30 and apertured to permit passage of the indexing pin 52 therethrough.

The tubular elements are preferably split, as at 60, to prevent eddy currents.

It will be seen that I have provided a simple and convenient arrangement whereby the wringer portion may be readily attached to the washer portion or demounted therefrom for convenient shipment of the separate parts, storage, etc., and which will also permit complete rotation of the wringer portion when assembled with the washer portion throughout a full 360 degrees. There being no electrical attachments to make or unmake when the parts are assembled or disassembled, there is no chance for loose connections and consequent electrical malfunctioning. Furthermore, inasmuch as the current is stepped down to an extremely low level, it will be seen that, even in the event that an operator should come in contact with a bare conductor which might become exposed in the wringer portion, there would be no possibility of danger from shock because of the low voltage. This is considered extremely important because of the fact that, when operating a washing machine, a person is likely to have wet hands and is also likely to be completely grounded, and, hence, contact with electrical energy of ordinary house voltage would be highly dangerous.

Fig. 5 shows another embodiment of my invention wherein a transformer (not shown) of any standard or other suitable form is inserted in the wiring circuit at any convenient point before the current reaches the juncture between the wringer portion and the washer portion. Such a transformer will be so designed as to step down the house current to a harmless value such as, say, 6 v.

Secured to the tubular element 18 which, as in the embodiment previously described, houses the mechanical power transmission, is a collar 65 which may be welded to the post 18. Secured to the upper face of the collar 65 is a pair of spaced contact rings 67, an insulating ring 68 being interposed between these contact rings and the collar 65. Electrical conductors 70 from the transformer previously described (not shown) are electrically connected to the rings 67.

The tubular element 30', which forms a part of the wringer portion and corresponds to the element 30 in the previous embodiment, has a terminal annular flange 72. A pair of contact pins 73 are slidably carried by the flange 72, suitable insulators 74 being provided therefor. These pins 73 have enlarged heads at the top and annular flanges 75, coiled springs 77 acting on the flanges 75 to urge the pins into contact with the rings 67. Conductors 80 are provided to convey electric current from the pins 73 to a lamp or other appliance in the wringer portion, as described above.

A manually operated indexing pin 82 is provided as in the other embodiment for angular adjustment of the wringer portion about the vertical axis of the post 18, the pin 82 cooperating with slots 85 formed in the collar 65.

It will be seen that, as in the embodiment first described, the form just referred to provides an arrangement whereby the wringer portion may be readily attached or detached from the washer portion, making safe and efficient electrical contact without the necessity for any manipulation of electrical connections. At the same time, a stock transformer may be employed, thus avoiding the expense of a specially wound transformer while obtaining all the benefits of the first embodiment.

Fig. 6 illustrates an embodiment more on the order of Fig. 2, i. e., where a special transformer is provided, one coil of which is carried by the washer post while the other coil is carried by the detachable wringer portion. In this embodiment,

however, instead of the coils being nested, as in Fig. 2, they are arranged in tandem formation.

As in the embodiment of Fig. 2, the numeral 12 represents a hollow post forming a part of the washing machine proper and the numeral 27 indicates a shell forming part of the wringer housing and which cooperates with the post 12 to form an extension thereof. Mechanical power is transmitted to the wringer by means of the bar 17 rotatable within tube 18.

Secured to the outside of the tube 18 is a stepped cylindrical element 90 having an annular flange 91 engaging the tube 18, a cup-shaped portion 92 housing a primary coil 93 and a somewhat larger cup-shaped portion 94 housing a secondary coil 95. It will be understood that the primary coil 93 is permanently fixed within the post 12 while the secondary coil 95 is secured to and removable with the wringer portion 27, the coil 95 being carried by an annular element 96 which seats against a resilient ring 97 which, in turn, is seated in a groove formed in tubular element 98. The annular element 96 has an out-turned flange 100 against which is seated an annular flange 102 preferably integral with the tubular element 98. A plurality of annular laminations of magnetic material 103 are secured between the flanges 102 and 100, while similar laminations 105 are retained adjacent the flange 91 below the primary coil 93.

A retaining or registering device, indicated generally by the numeral 110, is provided, this being similar to the corresponding feature shown in Fig. 2.

It is believed that the operation of the embodiment shown in Fig. 6 is too obvious to require any special detailed explanation. The transformer constituted by the coils 93 and 95 acts as in the other embodiment to step down the current from the relatively high voltage of the house current to a harmless voltage sufficient to operate any electric device on the wringer while at the same time the wringer element is fully rotatable and adjustable in any angular position. Attachment or detachment of the wringer portion is very easily carried out by a mechanically unskilled person without disturbing any of the electrical elements.

Various changes and modifications coming within the spirit of my invention may suggest themselves to those skilled in the art and, hence, I do not wish to be restricted to the specific form shown or uses mentioned, except to the extent indicated in the appended claims.

I claim:

1. In combination, a washing machine housing and a wringer housing detachably mounted thereon, a telescopic connection between the washing machine housing and the wringer housing permitting attachment and detachment by sliding axial movement, and means for transmitting electric power from the washing machine housing to the wringer housing including a step down transformer, one of the coils of said transformer being secured to the washing machine housing and the other coil being carried by the wringer housing, said coils being disposed adjacent each other when said housings are assembled together.

2. In combination, a washing machine housing and a wringer housing detachably mounted thereon, a telescopic connection between the washing machine housing and the wringer housing permitting attachment and detachment by sliding axial movement, and means for transmitting electric power from the washing machine housing to the wringer housing including a step down transformer, the electrical transmission elements between the washing machine housing and the wringer housing being non-interlocking, whereby the parts may be assembled and disassembled without manipulation of any electrical parts.

3. In combination, a washing machine housing and a wringer housing detachably mounted thereon, and means for transmitting electrical energy from said washing machine housing to said wringer housing comprising an electrical transformer, the primary coil of which is fixed to the washer housing and the secondary coil of which is fixed to the wringer housing.

4. In combination, a washing machine housing and a wringer housing detachably mounted thereon, said washing machine housing having a tubular post on one side thereof and said wringer housing having a hollow element constituting an extension of said post, and means for transmitting electrical energy from the washing machine housing to the wringer housing comprising an electrical transformer, said transformer consisting of an annular primary coil carried by said post and an annular secondary coil carried by said extension, said coils adapted to be nested.

5. In combination, a washing machine housing and a wringer housing mounted thereon, a tubular element carried by each of said housings, said elements telescoping each other to permit ready attachment and detachment of said housings and rotation of the wringer housing about said tubular elements, means disposed within said tubular elements for transmitting mechanical power from within the washing machine housing to within the wringer housing, and means for transmitting electrical energy between said housings comprising contact elements carried by the respective tubular members, the contact elements on one of said tubular members being annular and the contact elements on the other tubular member making sliding engagement with said annular contact elements whereby electrical energy will be transmitted in all positions of angular adjustment of the wringer housing.

6. In combination, a washing machine and a wringer, means rotatably mounting the wringer on said machine, and an electrical transformer arranged in said mounting means, portions of the mounting means constituting electrically operative elements of the transformer.

7. In combination, a machine having two hollow parts rotatably connected together and readily separable from each other, means for transmitting mechanical movement from within one part to within the other at the axis of rotative connection of said parts, and means for transmitting electrical energy from one part to the other comprising a transformer, one coil of said transformer being mounted in each of said parts, said coils being disposed adjacent each other when the parts are assembled together and being automatically separable by the separation of said parts.

8. In combination, a washing machine housing and a wringer housing mounted thereon with a rotatively adjustable connection between the washing machine housing and the wringer housing permitting angular adjustment of the wringer about the axis of said connection, and means for transmitting electric power from the washing machine housing to the wringer housing including a step down transformer together with separate electrical transmission elements carried re-

spectively between the washing machine housing and the wringer housing, said elements being relatively adjustable about the axis of said rotative connection without alteration of their electrical relation to each other.

9. In combination, a washing machine housing and a wringer housing mounted thereon, a tubular element carried by each of said housings, said elements telescoping each other to permit ready attachment and detachment of said housings and rotation of the wringer housing about said tubular elements, means disposed within said tubular elements for transmitting mechanical power from within the washing machine housing to within the wringer housing, and means for transmitting electrical energy between said housings by induction comprising a coil fixed to said washing machine housing and a coil fixed to said wringer housing, both coils being annular and being disposed adjacent each other in coaxial relation, whereby said electrical energy will be transmitted with equal efficiency in all positions of angular adjustment of the wringer housing.

10. In combination, a washing machine housing and a wringer housing mounted for rotative adjustment thereon, a metallic tubular element carried by one of said housings concentric with the axis of said rotative adjustment, means disposed within said tubular element for transmitting mechanical power from within one housing to within the other, and means for transmitting electrical energy between said housings by induction comprising a coil fixed to said washing machine housing and a coil fixed to said wringer housing, both coils being annular and being coaxial with said tubular element and said element serving as a core for said coils.

STANLEY WALLACE.