

Oct. 25, 1938.

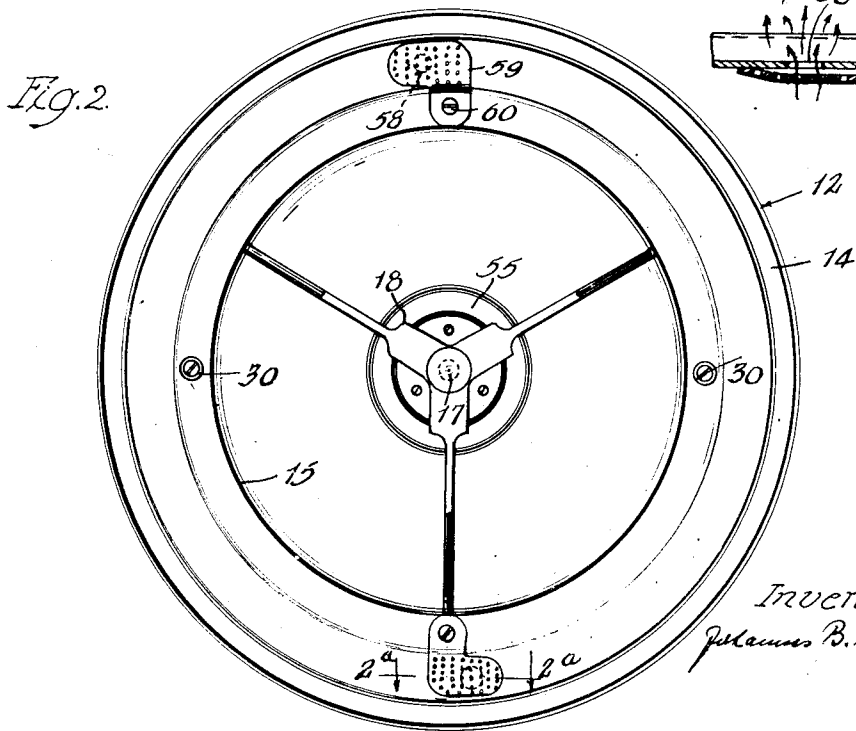
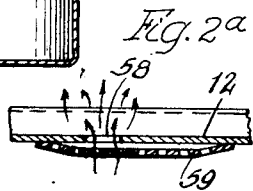
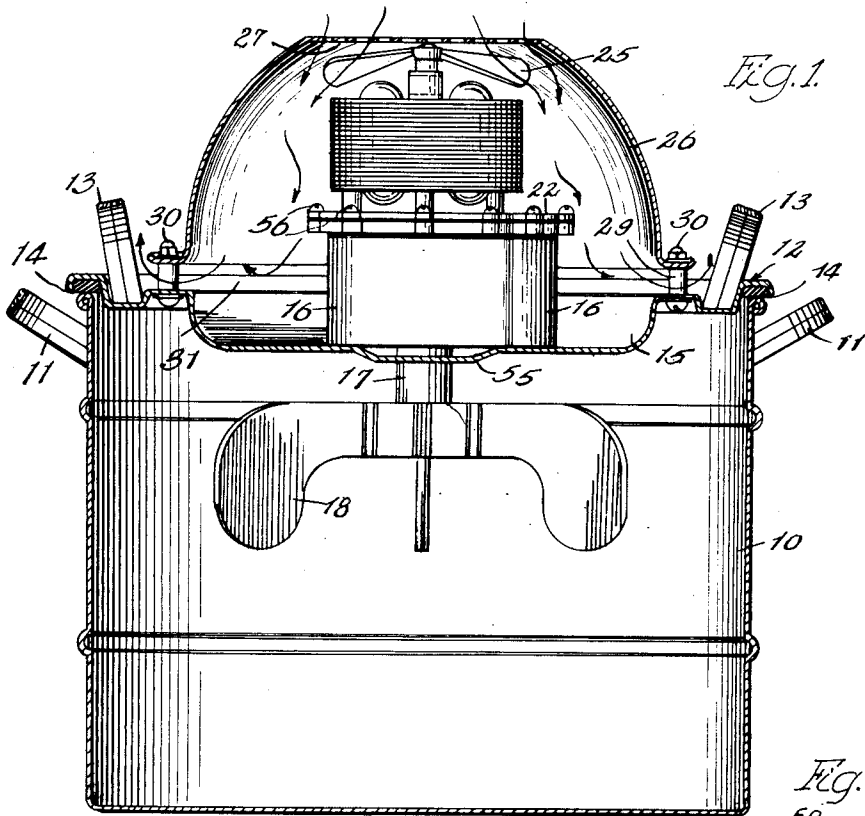
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2,134,048

WASHING MACHINE

Filed Jan. 4, 1938

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

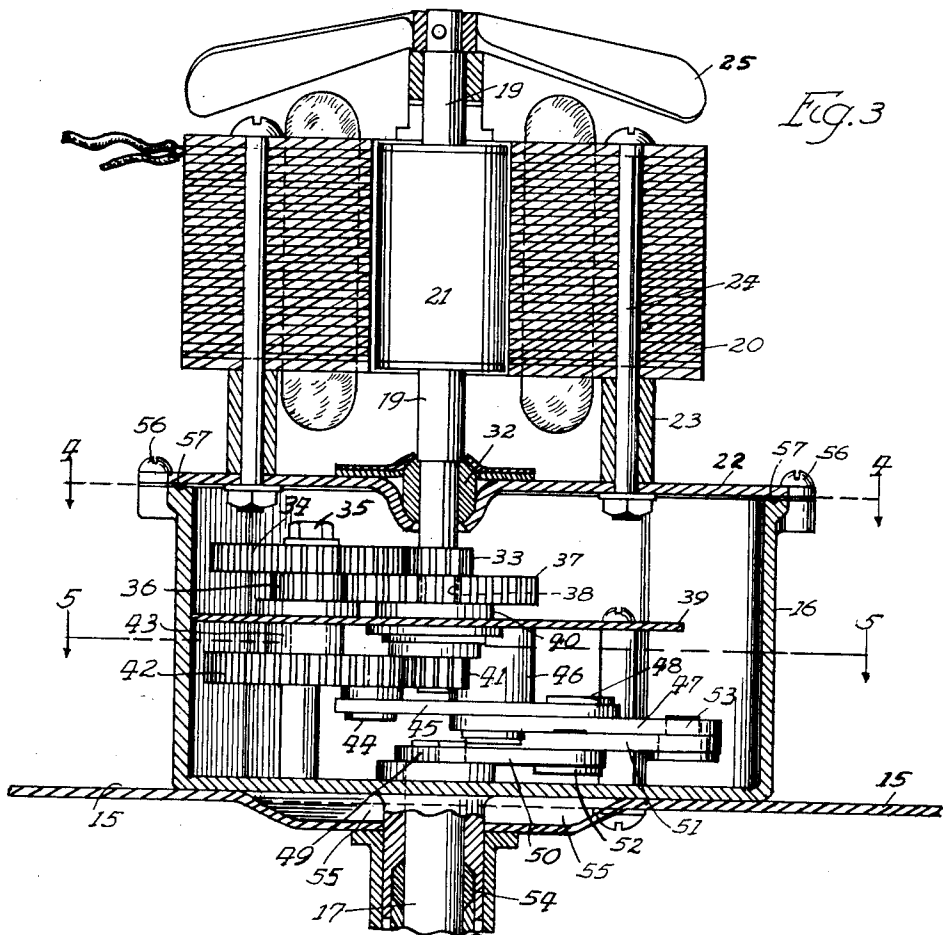


Fig. 3

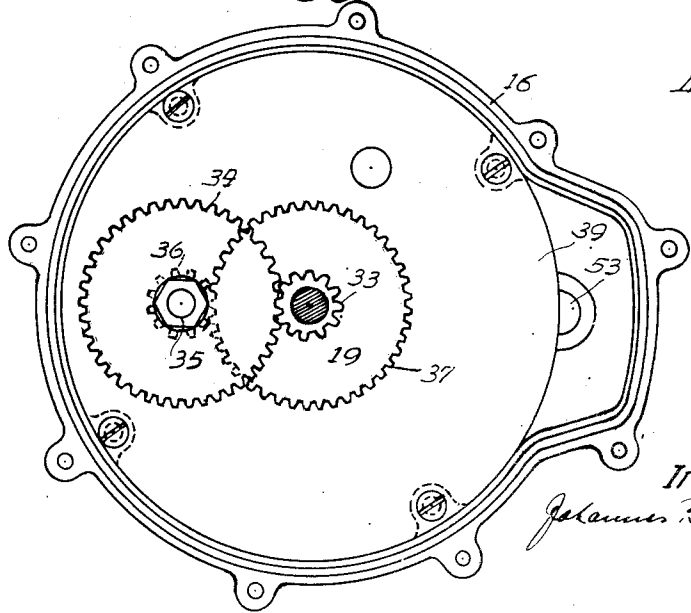


Fig. 4

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Fig. 5.

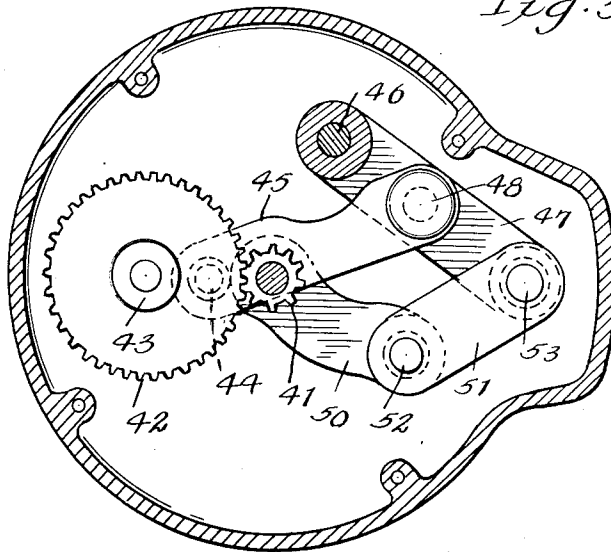


Fig. 6.

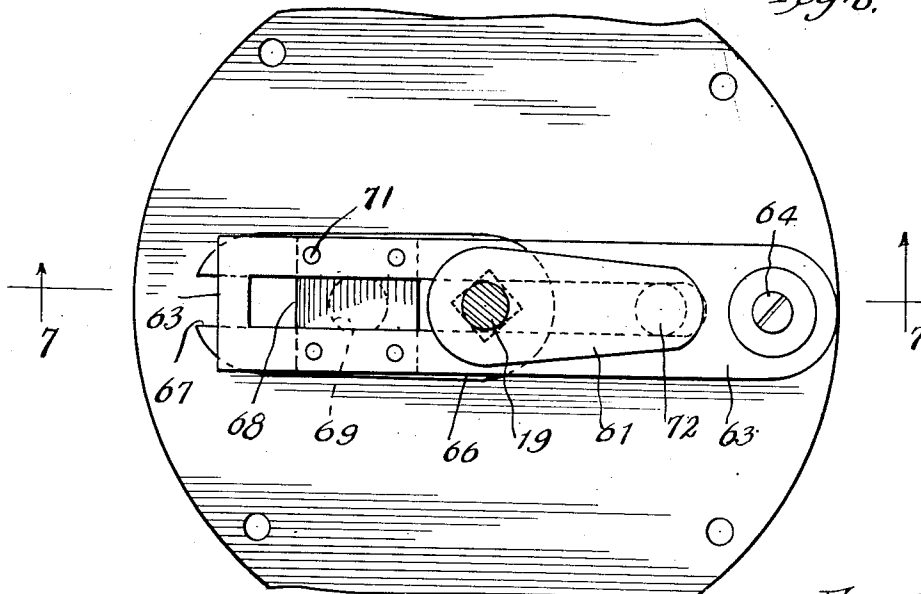
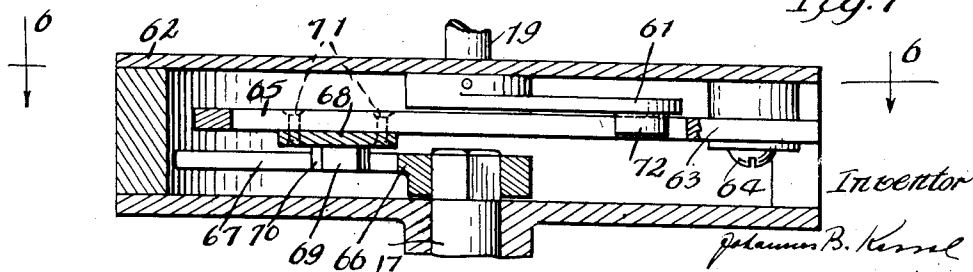


Fig. 7.



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UNITED STATES PATENT OFFICE

2,134,048

WASHING MACHINE

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12 Claims. (Cl. 68—132)

This invention relates to improvements in washing machines, but more specifically to the type of machine in which the agitator and the operating mechanism therefor are mounted upon a removable lid or cover for the machine.

Heretofore in machines of this character considerable difficulty and inconvenience have been experienced in that the high temperature within the machine not only heats the operating motor, but the lid or cover is also heated to such a degree as to render it difficult and uncomfortable to handle.

It is therefore one of the objects of the present invention to provide in a machine of this character improved means for causing a circulation of air currents over the motor or against the lid or cover of the machine to reduce the temperature of the motor and lid, to cool the same, so that the cover may be comfortable to handle, at the same time the reduced temperature of the cover or lid will result in the condensation of the steam or vapor within the machine, that contacts therewith.

A further object is to provide an improved hood which co-operates with a portion of the lid to form a chamber or casing in which the motor is housed, the hood or chamber having an air inlet and a discharge outlet, air being drawn through the inlet, circulated across the motor, directed against the lid and then discharged through the outlet, and air producing means being also housed within the hood or casing to be protected, thereby obviating the danger of injury to the operator.

A further object is to provide an improved agitator actuating means, which causes an oscillatory movement to the agitator.

A further object is to provide an improved washing machine of this character which may be readily placed upon a stove or heater, or beneath which heating means may be arranged, so that the articles being washed may at the same time be boiled, without the danger of heating the lid to such an extent that it would be uncomfortable or impossible for the operator to remove the same, the lid being maintained at a comparatively low temperature by air circulation creating means, regardless of the temperature within the container.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and

claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a vertical, longitudinal, sectional view of a machine of this character constructed in accordance with the principles of this invention.

Figure 2 is a bottom plan view of the cover and agitator removed from the machine.

Figure 2a is a detail, sectional view taken on line 2a—2a, Figure 2, on an enlarged scale.

Figure 3 is a detail view, partly in elevation, partly in section, with parts omitted and with parts broken away, on an enlarged scale, of the motor and driving connection for the agitator.

Figure 4 is a detail sectional view taken on line 4—4, Figure 3.

Figure 5 is a detail sectional view taken on line 5—5, Figure 3.

Figure 6 is a horizontal, sectional view taken on line 6—6, Figure 7.

Figure 7 is a detail, vertical sectional view taken on line 7—7, Figure 6, of a modified form of the invention.

Referring more particularly to the drawings, the numeral 10 designates generally a container which may be of any desired size and configuration and constructed of any suitable material, the container being provided with handles 11 by means of which it may be transported.

The numeral 12 designates generally a cover or lid for the container which is also constructed of any suitable material, preferably metal, and is provided with handles 13 by means of which the same may be elevated. If desired, suitable packing 14 may be connected to the cover or lid to engage and rest upon the top edge of the wall of the container 10 to form a tight joint.

The lid 12 is provided with a depressed portion 15 and arranged within this portion 15 is a casing or housing 16, in which is arranged a suitable transmission or connecting mechanism between an agitator shaft 17 carrying an agitator 18 and a motor disposed above the casing, and to the shaft 19 of which motor is connected one of the elements of the connection or transmission mechanism.

The said casing 16 constitutes a container for a lubricant and in which lubricant the connection or transmission mechanism is immersed.

The motor is surmounted upon the casing 16 and may be of any desired construction. A simple and efficient construction embodies a field 20 within which a rotor 21 operates, and which rotor is connected to the shaft 19.

The motor is supplied with electrical energy

from any suitable source (not shown) and the motor is preferably supported upon the top or closure 22 of the casing 16, by means of spacing members 23 and fastening bolts or elements 24, the spacing members 23 being of such a length as to provide a space between the motor and the top 22 of the casing 16, for the circulation of air currents.

Connected to the motor shaft 19, at the upper end thereof, and above the motor, is a fan or air circulation creating means 25, so that when the motor is operated and the shaft 19 rotated, the fan will direct air currents against the motor, also against the casing 16 and against the lid or closure 12, so as to reduce the temperature thereof and maintain these parts against becoming overheated by the temperature within the container 10.

A hood 26 is provided which co-operates with a portion of the closure 16 to form a casing within which the motor, the fan and the casing 16 are housed. The hood is provided with an air inlet opening 27, preferably in the form of small openings, to permit air to be drawn into the hood, and the lower edge 28 of the hood terminates short of the lid or cover 12, the hood preferably being held in position by means of spacing members 29 and fastening bolts 30, so as to form a discharge outlet opening 31 extending about the casing 16 and through which outlet opening 31, the air currents are discharged.

It will thus be seen that the air currents created by the air circulating creating means 25, will serve to reduce the temperature of all of the parts within the hood 26 and being directed against the lid or closure 12, will reduce the temperature of the latter so as to permit the closure with all of the agitator operating means supported thereby to be lifted from the container when desired.

By maintaining the lid or closure 12 at a temperature less than the temperature within the container 10, the steam or vapor contacting with the closure will be condensed and directed back into the container.

With this construction it will be manifest that the container 10 may be placed over a source of supply of heat, so that the contents of the container 10 may be boiled at the same time that it is being agitated by the agitator 20, the air currents created by the circulation creating means 25 serving to prevent the lid or cover 12 and the agitator operating means from becoming overheated.

The shaft 19 passes through a suitable bearing 32 which is preferably of a nature to dispense with the necessity of lubricating the same, and secured to the shaft 19 for rotation therewith and within the casing 16, is a pinion gear 33 which meshes with a gear 34.

Connected to the gear 34 to rotate therewith is a pinion gear 36 which in turn meshes with a gear 37, connected to a stub shaft 38, the latter being mounted upon a support 39 in suitable bearings 40. Secured to the gear 37 for rotation therewith is a pinion gear 41, and this gear in turn meshes with a gear 42 connected to the stub shaft 43 of the gear 34.

The gear 42 is provided with a crank pin 44, to which one end of a link 45 is pivotally connected.

Pivotally mounted upon a stud 46 and by one end thereof, is a link 47, and to this link 47 and intermediate the ends thereof as at 48, is pivotally connected the other end of the link 45.

The agitator shaft 17 projects into the casing 16 and secured to the end of the agitator shaft as at 49 is one end of a link 50.

A link 51 is pivotally connected by one end as at 52 to the free end of the link 50, and the other end of the link 51 is pivotally connected as at 53 to the free end of the link 47.

With this construction it will be manifest that when the shaft 19 of the motor is rotated, the gear 33 will rotate the gear 34 and the gear 36 connected to the gear 34 will rotate the gear 37, to which latter is connected the gear 41. The gear 41 meshing with the pinion 42 will then be rotated and this will rotate the crank pin 44, causing the link 47 to be rocked about its pivot 47 backwardly and forwardly. This link 47 being connected to the agitator shaft 17 through the medium of the links 51 and 50 will thereby cause an oscillatory motion to be imparted to the agitator shaft 17, while the direction of rotation of the motor shaft 19 remains constant.

Obviously, suitable packing 54 will be provided for the agitator shaft in its bearing in the lid or closure 12.

The bottom of the depressed portion 15 of the closure 12 may be provided with a further depressed portion 55, which encompasses the agitator shaft and forms a dead air space between the bottom of said depressed portion 15 and the bottom of the casing 16.

The closure 22 of the casing 16 may be removably secured in position by means of fastening devices 56, and suitable packing 57 may be provided, if desired.

If desired, and to provide a venting means to permit the escape of some of the vapors from the container 10 when the closure 12 is in position, the closure may be provided with any desired number of openings 58 therethrough, and located in any suitable position. A reticulated member 59 forms a closure for each of said openings, and this member 59 may be pivotally mounted as at 60. With this form of closure 59, it will be manifest that by reason of the small openings in the reticulated member, the steam or vapor will be distributed and will be prevented from flowing out of the opening 58 with any considerable force and will be condensed within the space between the cover and the reticulated member and will flow back into the container.

In the form of the invention shown in Figures 6 and 7, another form of connection means is provided between the motor and the agitator shaft.

This form of the invention consists of an arm 61, which is connected to the end of the motor shaft 19 and disposed within a casing 62.

A member 63 is pivotally mounted by one of its ends as at 64 to a fixed support, and this member 63 is of a substantial length and is provided with a slotted portion 65.

Secured to the agitator shaft and within the casing 62, is an arm 66 which is bifurcated as at 67.

Connected to the member 63 is a block or member 68 provided with a lug 69, upon which lug may be loosely mounted a bearing member 70, and which member 70 is mounted to slide in the bifurcation 67 of the arm 66.

The block or member 68 is secured to the member 63 for adjustment lengthwise thereof by means of suitable fastening devices 71, so that the member 68 may be moved toward or away from the pivot 64 of the member 63 and then fastened in any manner well known in this art,

as may be desired, to vary the extent or degree of oscillatory movement of the agitator shaft 17.

With this construction it will be manifest that when the motor shaft 19 rotates, the crank 61 with a lug 72 thereon, which operates in the slot 65 of the member 63, will rock the member 63 about its pivot 64. This rocking of the member 63 will in turn, through the medium of the lug 69 and bearing 70, oscillate the arm 66 and thereby impart an oscillatory movement to the agitator shaft 17.

With both of these forms of the invention it will be manifest that there will be provided an improved machine of this character in which the motor shaft will have a constant direction of rotation, while the agitator shaft will have an oscillatory movement, and the degree of oscillation imparted to the agitator shaft may, in the form of the invention shown in Figures 6 and 7, be varied as desired.

In both forms of the invention the connecting gearing or connection mechanism between the motor shaft and the agitator will be protected and all of the parts will be mounted upon the lid or closure for the container 10.

The air circulation creating means will direct air currents across all of the operating parts to maintain the same at a low temperature, regardless of the degree of temperature within the container, and the closure 12 against which the air currents are also directed will be maintained at a comparatively low temperature with respect to the temperature in the container, so as to render it possible for the operator to remove or replace the closure and the operating mechanism with ease and comfort.

While the preferred forms of the invention have been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A washing machine embodying an article container, a closure therefor, an agitator shaft depending from the closure, a motor for operating the said shaft, said motor disposed outside of the container and positioned substantially centrally of the closure and on an upright axis, a hood for the motor, means for supporting the hood by the closure, said hood having an air inlet and an air outlet, and a fan within the hood and disposed above the motor, for drawing air into the hood through said inlet, circulating the air across the motor, and directly against and across said closure out of said outlet opening.

2. A washing machine embodying an article container, a closure therefor, an agitator shaft depending from the closure, a motor for operating the said shaft, said motor disposed outside of the container, a hood for the motor, means for supporting the hood by the closure, said hood having an air inlet and an air outlet, said inlet and outlet being spaced from each other, and a fan within the hood for drawing air into the hood through said inlet, circulating the air across the motor and forcing the same directly against said closure, and causing the air to flow out of said outlet opening, said fan being disposed above the motor, between the inlet and outlet of said hood, adjacent the inlet and connected with the motor shaft.

3. In a washing machine a container, a removable closure, an agitator shaft supported by the

closure, a motor for actuating the shaft and disposed outside of the container, a hood for the motor, said hood being of an internal diameter considerably greater than the diameter of the motor, said hood supported by the closure with the lower edge of the hood in close proximity to but spaced from the closure to form an air outlet opening extending about the motor, said hood having an air inlet opening remote from said outlet opening, a fan within the hood connected to the motor shaft and disposed above the motor and adjacent said inlet for causing a circulation of air currents through said hood and against said closure, and handles secured to the closure in the path of the flow of the air currents from said outlet opening.

4. In a washing machine, a container, a closure therefor, an agitator within the container, a motor supported by the closure outside of the container substantially centrally of the closure and on an upright axis, a hood for the motor, said hood having an air inlet and an air outlet disposed in proximity to said closure, operating transmission mechanism between the motor and the agitator and disposed within the hood, and a fan within the hood and disposed above the motor for causing a circulation of air currents through said hood, and a blast of air currents down and against the motor, transmission mechanism and closure, and means between said transmission and said agitator for causing said agitator to operate with an oscillating movement while the direction of operation of the motor remains constant.

5. In a washing machine, a container, a cover for the container, a hood supported by the cover and having an air opening, the base of the hood being spaced from said cover to provide another air opening, said air openings being separated from each other, a casing between the hood and cover, an agitator shaft supported by the cover and extending into said casing and also into said container, an agitator carried by said shaft, operating mechanism for said shaft disposed within said casing, a motor supported above the casing and between the hood and cover and operatively connected to said operating mechanism, and a fan connected with the motor shaft and disposed above the motor, whereby upon operation of the fan, air currents will be directed through one opening against the motor, casing and cover, and discharged through the other of said openings.

6. In a washing machine, a container, a cover for the container, a hood supported by the cover, the base of the hood being spaced from said cover to provide an air passageway therebetween, a casing between the hood and cover, an agitator shaft supported by the cover and extending into said casing and also into said container, said casing being closed and constituting a lubricant container, operating mechanism for said shaft disposed within said casing, a motor supported above the casing and between the hood and cover and operatively connected to said operating mechanism, an agitator carried by the shaft within the container, and a fan connected with the motor shaft and disposed above the motor to direct a blast on to the motor, there being an air inlet opening in the hood spaced from said air passageway, whereby upon operation of the fan, air currents will be directed against the motor, the said casing, the said cover, and out through said air passageway.

7. In a washing machine a container, a cover

for the container, an agitator shaft depending from said cover, operating mechanism for the shaft, said operating mechanism mounted upon the cover, a hood supported by the cover, the base of the hood being spaced from the cover to form an air passageway and being of a diameter considerably less than the diameter of the cover, a motor surmounting the operating mechanism, the shaft of the motor rotating on a vertical axis, and a fan connected to the motor shaft and disposed above the motor to direct a blast against the motor, and also against said cover, said operating mechanism, motor and fan being disposed within said hood and said hood having another air passageway spaced from said first air passageway, one of said passageways serving as an air inlet and the other as an air outlet.

8. In a washing machine a container, a cover for the container, an agitator shaft depending from said cover, operating mechanism for the shaft, said operating mechanism mounted upon the cover, a hood supported by the cover, the base of the hood being spaced from the cover to provide an air passageway and being of a diameter considerably less than the diameter of the cover, a motor surmounting the operating mechanism, the shaft of the motor rotating on a vertical axis, a fan connected to the motor shaft and disposed to direct a blast against the motor and also against said cover, said operating mechanism, motor and fan being disposed within said hood and said hood having an air inlet opening spaced from said air passageway, and handles connected to said cover, said handles being disposed in the path of flow of the air currents through said passageway.

9. In a washing machine, a container, a cover therefor, a compartment above the cover, said cover forming a wall of the compartment, said compartment provided with an air inlet opening and an outlet opening, said openings spaced from each other, a casing within the compartment, an agitator shaft supported by the cover and extending into the casing, and also into the container, an agitator within the container and connected with said shaft, operating mechanism for the shaft disposed within said casing, a motor in the compartment and supported above the casing and operatively connected with said operating mechanism, a fan in said compartment and disposed above the motor to direct a blast down on the motor, the casing and against the said cover, and causing air currents to be drawn into said

compartment through one of said openings, and discharged through the other of said openings.

10. In a washing machine, a container, a cover for said container, said cover comprising a cap and cover plate, an agitator shaft depending from said cover plate, an agitator connected with said shaft, driving means for said shaft positioned between said cap and cover plates, a motor supported above said driving means, and a fan above the motor and disposed to direct a blast downward against the motor and also against the cover plate, there being an air outlet opening through which air is discharged between the cap and cover plate and there being an air inlet passage spaced from said air outlet opening, one of the said air inlets and outlets being disposed in close proximity to said cover plate.

11. In a washing machine, a container, a cover for said container, said cover comprising a cap and cover plate, an agitator shaft depending from said cover plate, an agitator connected with said shaft, driving means for said shaft positioned between said cap and cover plates, a motor supported above said driving means, a fan above the motor and disposed to direct a blast downward against the motor and also against the cover plate, said cap being shaped to form a hood the bottom of which is disposed adjacent but spaced from the cover plate to form an air outlet, the base of the hood being disposed within and spaced a substantial distance from the periphery of said cover plate, there being an air inlet for the hood spaced from said air outlet, and handles connected with the cover plate between the peripheries of the base of the hood and cover plate and in alinement with the air outlet passage, one of the said air inlets and outlets being disposed in close proximity to said cover plate.

12. In a washing machine embodying an article container, a closure therefor, an agitator shaft depending from the closure, a motor for operating the shaft, said motor disposed outside of the container, and positioned on an upright axis, a hood for the motor, means for supporting the hood by the closure, said hood having a plurality of air openings, and a fan within the hood and disposed above the motor for drawing air into the hood through one of said openings, circulating the air down and over the motor and directly against said closure and said hood out of another of said openings.

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