Feb. 21, 1950 A. H. GERHARDT 2,498,544

CLOTHES RECEPTACLE FOR WASHING MACHINES

Filed May 4, 1945 2 Sheets-Sheet 1

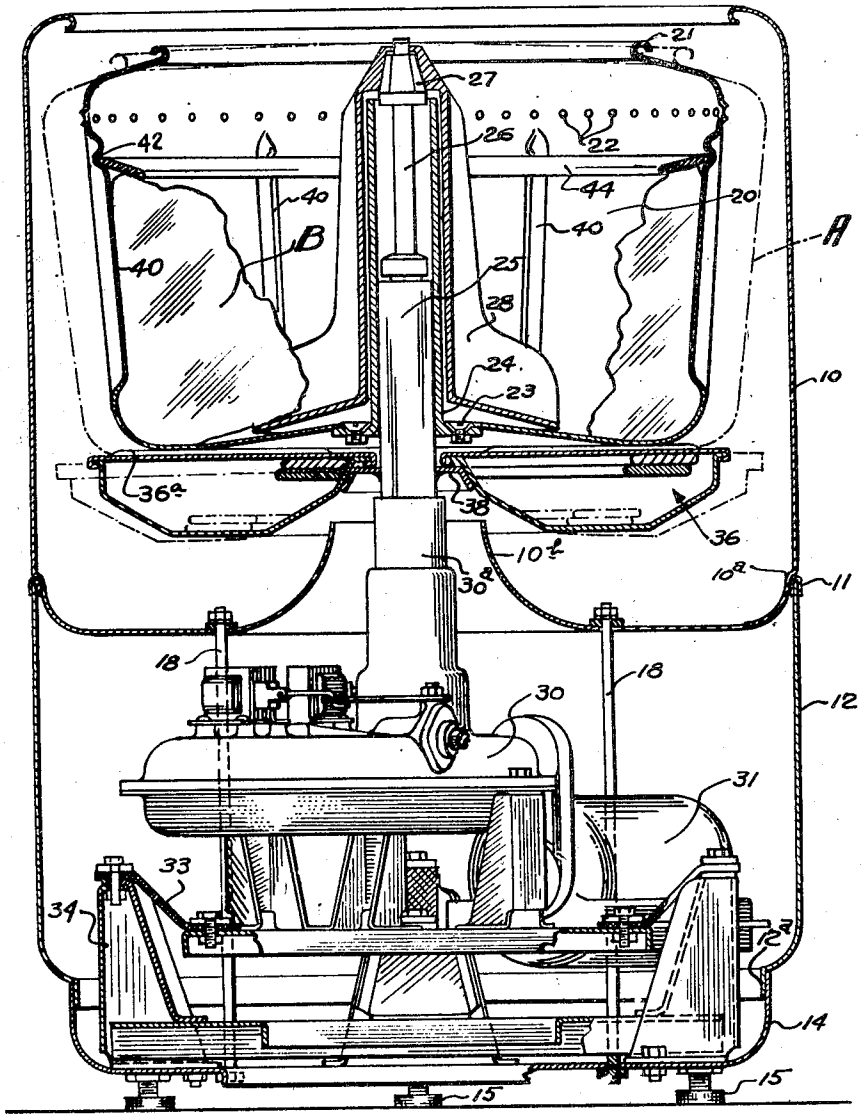


FIG. 1.

INVENTOR.
ANDREW H. GERHARDT
BY
A. H. Molinare
HIS ATTORNEY

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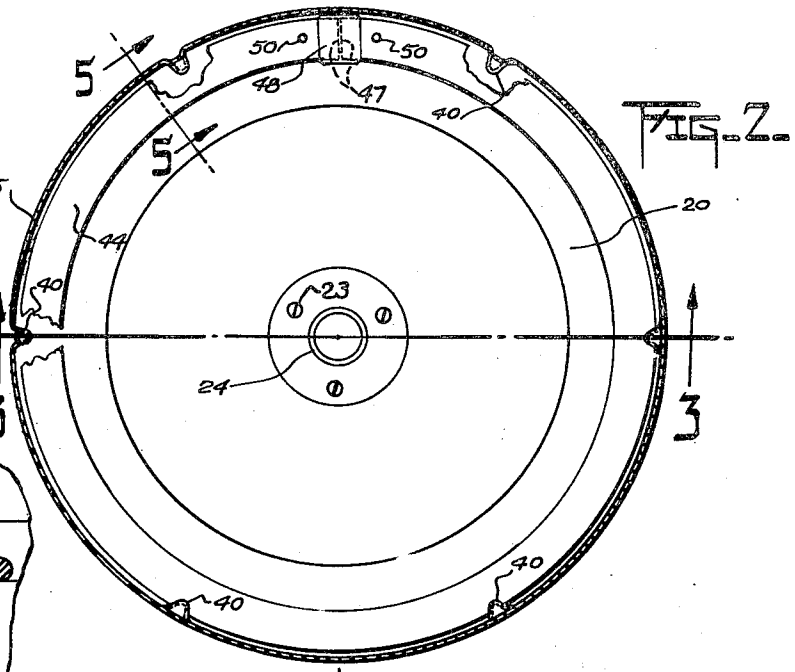


FIG. 2.

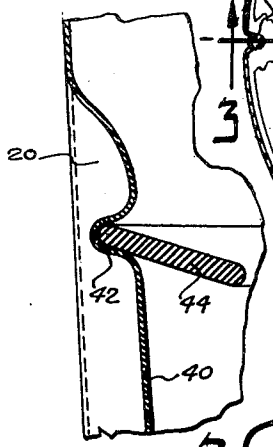


FIG. 4.

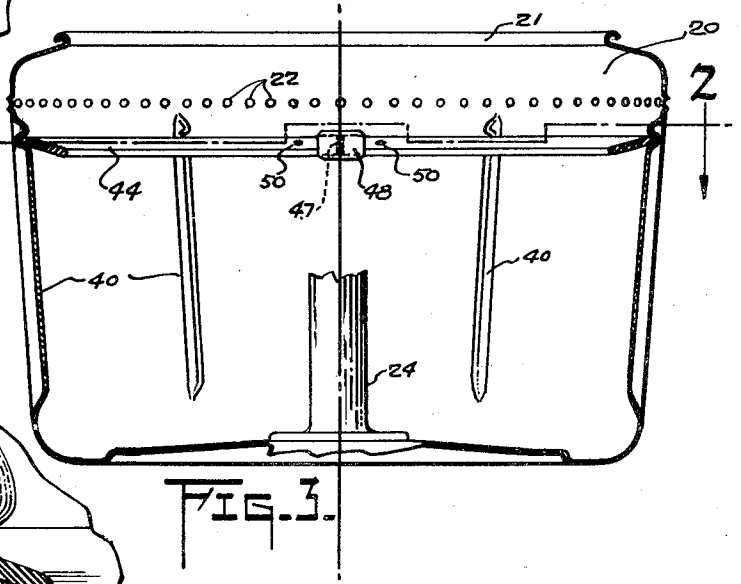


FIG. 3.

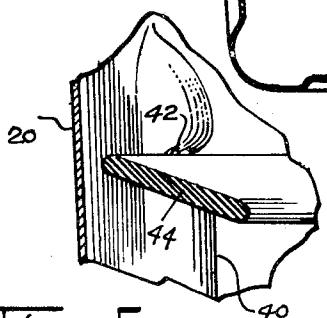


FIG. 5.

INVENTOR.
ANDREW H. GERHARDT
BY
HIS ATTORNEY

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UNITED STATES PATENT OFFICE

2,498,544

CLOTHES RECEPTACLE FOR WASHING MACHINES

Andrew H. Gerhardt, Skokie, Ill., assignor to Thor Corporation, a corporation of Illinois

Application May 4, 1945, Serial No. 591,873

2 Claims. (Cl. 210—76)

1

This invention relates to improvements in centrifugal machines, such as laundering machines. More particularly, this invention is directed to centrifugal machines of the type having an upright imperforate receptacle having an upwardly and outwardly tapering side wall, mounted for rotation about an upright axis, and wherein the receptacle is adapted to contain solid material, such as clothes, together with a cleansing solution. In machines of this type, when the receptacle is rotated at a relatively high rate of speed, the major portion of the cleansing solution is separated from the solids by the action of centrifugal force.

Considerable difficulty has heretofore been experienced, in machines of this general class, in obtaining uniform distribution of the solid material around the axis of rotation of the receptacle. When the solid material is non-uniformly distributed, there is produced an out-of-balance or off-center load condition, which results in excessive and undesired vibration of the entire machine, while the receptacle is rotating. To overcome this condition, certain types of counterbalancing units have been provided, and one of the most effective arrangements consists in the provision of such a unit immediately below the receptacle. It has been found, however, that while rotating the receptacle at a high rate of speed, the counterbalancing unit tends to effectively compensate for off-center loads, but there is also a tendency for the solid material to move upwardly along the side walls of the receptacle, which creates an objectionable condition of dynamic unbalance.

The primary object of the present invention is to provide a novel and improved receptacle construction, by virtue of which, the solid material is confined or limited in its vertical movement along the walls of the receptacle, incident to rotation thereof, tending to maintain a proper dynamic balance of the receptacle.

Another object is to provide in a centrifugal machine of the character indicated, an improved centrifuging receptacle of the type having a series of circumferentially spaced-apart apertures, adjacent the upper end thereof, and provided with novel means for limiting the upward movement of solid material along the side wall of the receptacle, so as to preclude said material from covering said apertures while the receptacle is rotating.

Another object is to provide in a centrifugal machine of the character indicated, an improved centrifuging receptacle of the type having a series

2

of circumferentially spaced-apart apertures adjacent the upper end thereof, and provided with a baffle ring mounted adjacent the wall of the receptacle, below said apertures, and in spaced-apart relation to the wall of the receptacle, so as to limit upward movement of the solid material along the side wall of the receptacle, while permitting the cleansing solution to travel freely in an upwardly direction along said side wall of the receptacle for discharge through the apertures, while the receptacle is rotating.

Other objects and advantages of this invention will be apparent from the following description, taken in connection with the accompanying drawings, in which:

Fig. 1 is a vertical section through a centrifugal machine, the upper portion being a true axial section, and the lower portion representing a staggered section, and provided with an improved centrifuging receptacle embodying the present invention.

Fig. 2 is a horizontal, sectional view through the receptacle, taken substantially as indicated at line 2—2 on Fig. 3.

Fig. 3 is a vertical, axial section, through the receptacle, taken substantially as indicated at line 3—3 on Fig. 2.

Fig. 4 is an enlarged, fragmentary, vertical section through the side wall of the receptacle, and taken subtsantially at the plane of the section, as indicated at line 3—3 on Fig. 2.

Fig. 5 is an enlarged, fragmentary, vertical section taken as indicated at line 5—5 on Fig. 2.

The machine illustrated in the drawings is of the general type intended primarily for household use as a laundering machine for performing a washing and extracting or drying operation upon clothes. The machine includes an external liquid collector receptacle 10, having its bottom formed with an offset portion, as indicated at 10a, seated in nested relation upon a resilient gasket 11, mounted upon the upper marginal edge of skirt 12. The lower end of the skirt terminates in an inwardly projecting neck 12a, telescoped into the flanged portion of a base member 14, and the latter being supported by three circumferentially spaced-apart feet 15. The liquid collector receptacle 10, together with the skirt 12 and base 14, are rigidly connected together and assembled in nested relation by a plurality of tie rods 18, as clearly seen in Fig. 1 of the drawings.

Mounted within the liquid collector receptacle 10, is a receptacle 20, in which clothes are adapted to be washed, and also subjected to a centrifu-

gal extracting operation for effecting removal of the major portion of free cleansing solution or liquid from the clothes. The receptacle 20 is of circular contour, and the lateral or side wall thereof tapers in an outwardly and upwardly direction, and terminates at its upper edge in a reversely bent marginal flange 21. Adjacent the upper end of the side wall of the receptacle 20, is a series of circumferentially spaced-apart apertures 22, through which the cleansing solution in the receptacle may be discharged into the liquid collector receptacle 10, when the receptacle 20 is rotated. The receptacle 20 has rigidly connected to its bottom at the center thereof, by means of screws 23, an upstanding tubular sleeve 24, adapted to surround an upwardly extending tubular drive shaft 25, which is adapted to be rotated in one direction. Mounted concentrically within suitable bearings, not shown, within the drive shaft 25, is an oscillatable agitator shaft 26, terminating above the upper end of the sleeve 24, and provided at said upper end with a driving block 27, on which is seated in driving relation, a vaned agitator element 28, adapted to be oscillated within the receptacle 20.

Mounted within the skirt portion 12, is a suitable drive mechanism, indicated generally at 30, adapted to be driven by an electric motor 31, and by virtue of which the tubular drive shaft 25 and the agitator shaft 26, are adapted to be selectively driven. Said mechanism 30, together with the motor 31, are supported on a flexible suspension by means comprising three circumferentially spaced-apart flexible straps 33, which in turn are connected to a supporting frame structure 34. Since said mechanism and manner of suspension constitutes no part of the present invention, it is not believed necessary to describe the same in detail. It is to be understood that the liquid collector receptacle 10 is provided with a suitable outlet, not shown, operably connected to a power driven pump, for effecting prompt removal from said collector receptacle of all liquid discharged from the centrifuging receptacle 20. The central area of the receptacle 10 is formed with an upwardly open neck 10^b, which provides clearance for and accommodation of the upstanding tubular portions 30^a of the mechanism 30, when the machine is functioning as a centrifugal extractor, and during which time the receptacle 20 may be caused to travel in an orbit, as represented in dot and dash outline at A, such as when the receptacle contains an out-of-balance load, as represented at B.

The counter-balancing unit, indicated generally at 36, constitutes the subject matter of my co-pending application, Serial No. 542,850, filed June 30, 1944, now Patent No. 2,420,592, May 13, 1947, and no detailed description thereof, is herein believed necessary, other than to state that said unit tends to automatically compensate for a normal or average out-of-balance load condition within the receptacle 20, such as represented at B. During the time that the receptacle is rotated, said balancer unit 36 is frictionally supported upon a flange 38, which in turn is rigidly attached to the tubular drive shaft 25. The receptacle 20 is supported directly upon upstanding ribs 36^a, formed on the unit 36, by virtue of which said receptacle is frictionally driven. If desired, obviously the receptacle may be driven directly from the tubular drive shaft 25.

The improved centrifuging receptacle embodying the present invention has its side wall formed with a plurality of upright, circumferentially spaced-apart, inwardly projecting ribs 40, which terminate at their upper ends below the series of apertures 22. Each of said ribs adjacent the upper end, is formed with a socket type of seat, as indicated at 42, in which is adapted to be supported an annular baffle ring 44, as may be clearly seen in Fig. 4 of the drawings. The depth of the socket seat 42, with relation to the side wall proper of the receptacle, is such as to provide a narrow passageway 45, between the outer edge of the baffle ring and the wall of the receptacle. The baffle ring may be formed solid, perforate, or reticulated. I prefer, however, to employ a solid material ring in order to obtain adequate rigidity. As shown, the baffle ring is formed so that when disposed in operative position, its main flat surface inclines in an inwardly and downwardly direction, as clearly seen in Figs. 3 and 4 of the drawings. The free ends of the ring, as indicated at 47, in Fig. 2 of the drawings, are interconnected by a flattened, tubular metallic sleeve 48. Adjacent said ends of the ring are a pair of apertures 50, adapted to receive a pair of prongs of a suitable expander tool. It is to be understood that the ring, with the ends in disconnection relation, is first positioned in partial seated engagement in the sockets 42 of the ribs 40, and by means of a suitable expander tool, engaging the apertures 50, the baffle ring is expanded and the ends of the rings are forced apart sufficiently, so as to permit one of the ends, upon release of pressure on the tool, to extend into one end of the sleeve 48, it being understood that the opposite end of the sleeve is firmly mounted on the other end of said ring. Such expanding movement of the ring is permitted by the space defined by the passages 45. By virtue of this arrangement, when the ring is finally assembled, it becomes seated in a relatively rigid manner in the sockets 42. The baffle ring, when the receptacle 20 is rotating in the process of centrifugally extracting the liquid cleansing solution from the clothes, serves to limit the extent of upward movement of the solid material or clothes along the side wall of the receptacle, while at the same time permitting the liquid cleansing solution to flow freely, in an upwardly direction, through the passages 45, for discharging through the apertures 22, into the collector receptacle 10. Thus by virtue of the baffle ring, the clothes are confined so as to preclude the possibility of covering the apertures 22, which would impair and interfere with the free removal of the liquid cleansing solution from within the receptacle during the extracting operation.

Another important advantage flowing from the provision of the baffle ring is that it tends to confine the solid material to some extent, in close proximity to the plane of operation of the counter-balancing unit 36, and thereby tends to assist in maintaining a proper dynamic balance of the receptacle and its load. It will be apparent that the greater the distance that the load is permitted to move, in the direction away from the plane of counter-balance, the greater is the tendency for the receptacle to acquire a non-dynamic condition of balance. Hence, by limiting the upward movement of the clothes during the extracting operation, the matter of obtaining proper balance, even when the clothes are distributed non-uniformly, is attained within practical operating limits.

Although I have herein shown and described a preferred embodiment of my invention, manifestly it is capable of modification and rearrange-

ment of parts without departing from the spirit and scope thereof. I do not, therefore, wish to be understood as limiting this invention to the precise embodiment herein disclosed, except as I may be so limited by the appended claims.

I claim:

1. In a centrifugal laundering machine, the combination of an upright driving shaft, an upwardly open receptacle of circular cross-section mounted on and adapted to be driven by said shaft, the side wall of said receptacle tapering in an upwardly and outwardly direction; the upper portion of the side wall of the receptacle being formed with a series of circumferentially spaced-apart apertures through which liquid from the receptacle is caused to be discharged incident to rotation of the receptacle, said side wall of the receptacle, below said series of apertures, being formed with a plurality of inwardly projecting sockets, and an annular baffle seated in said sockets, and disposed in spaced-apart relation to said side wall of the receptacle, whereby the clothes in the receptacle is limited in upward movement in the receptacle and precluded from covering said apertures while the receptacle is rotating.

2. In a centrifugal laundering machine, the combination of an upright driving shaft, an upwardly open receptacle of circular cross-section mounted on and adapted to be driven by said shaft, the side wall of said receptacle tapering in an upwardly and outwardly direction; the upper portion of the side wall of the receptacle

being formed with a series of circumferentially spaced-apart apertures through which liquid from the receptacle is caused to be discharged incident to rotation of the receptacle, the side wall of the receptacle being formed with a plurality of circumferentially spaced-apart upright, inwardly projecting ribs, sockets formed in said ribs a substantial distance below said apertures, and an annular baffle member seated in said sockets in spaced relation to the wall of the receptacle, whereby clothes in the receptacle is limited in upward movement adjacent the wall of the receptacle and precluded from covering said apertures while the receptacle is rotating.

ANDREW H. GERHARDT.

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