

Oct. 31, 1944.

C. H. HAYS, JR

2,361,767

LAUNDERING MACHINE

Filed Dec. 4, 1939

7 Sheets-Sheet 1

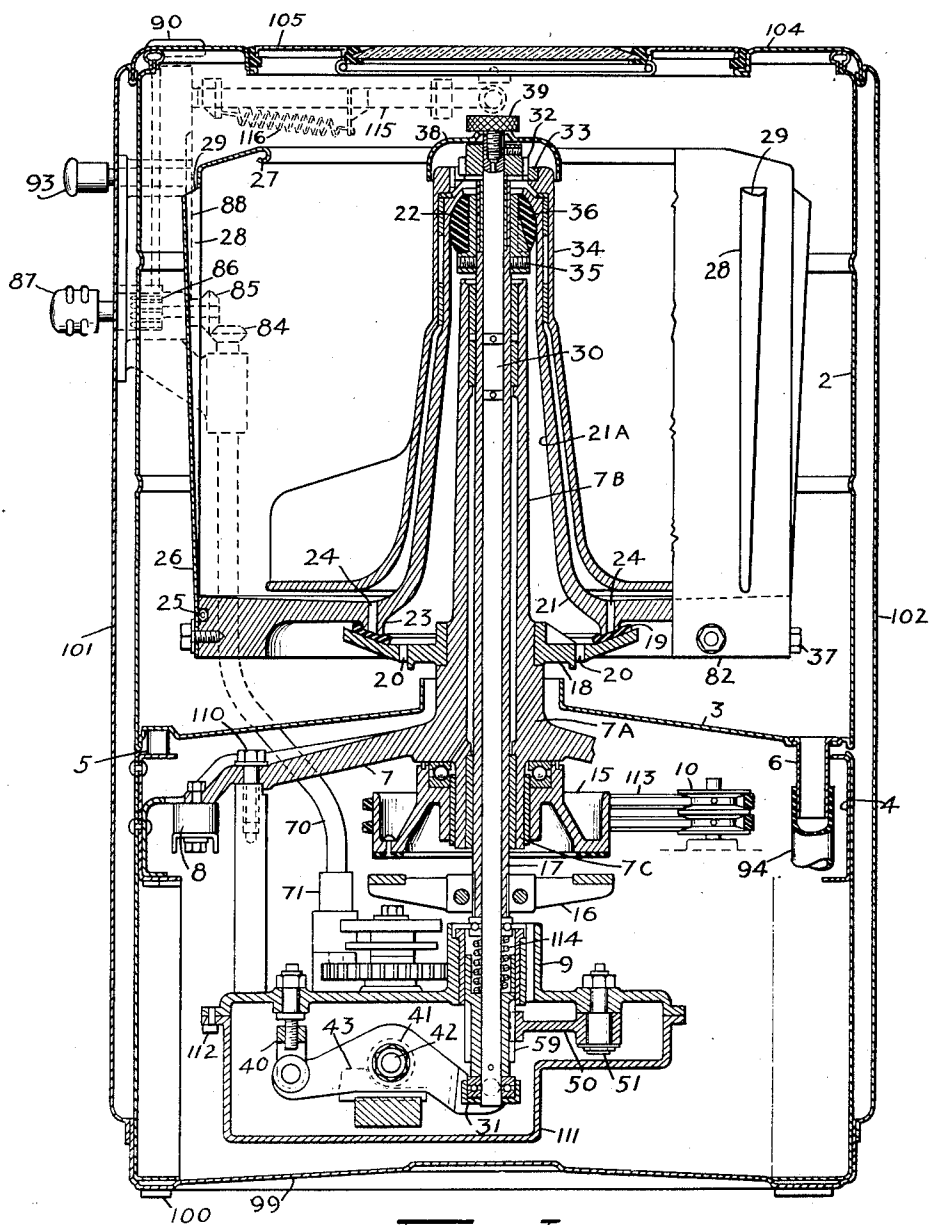


FIG. I

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LAUNDERING MACHINE

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7 Sheets-Sheet 2

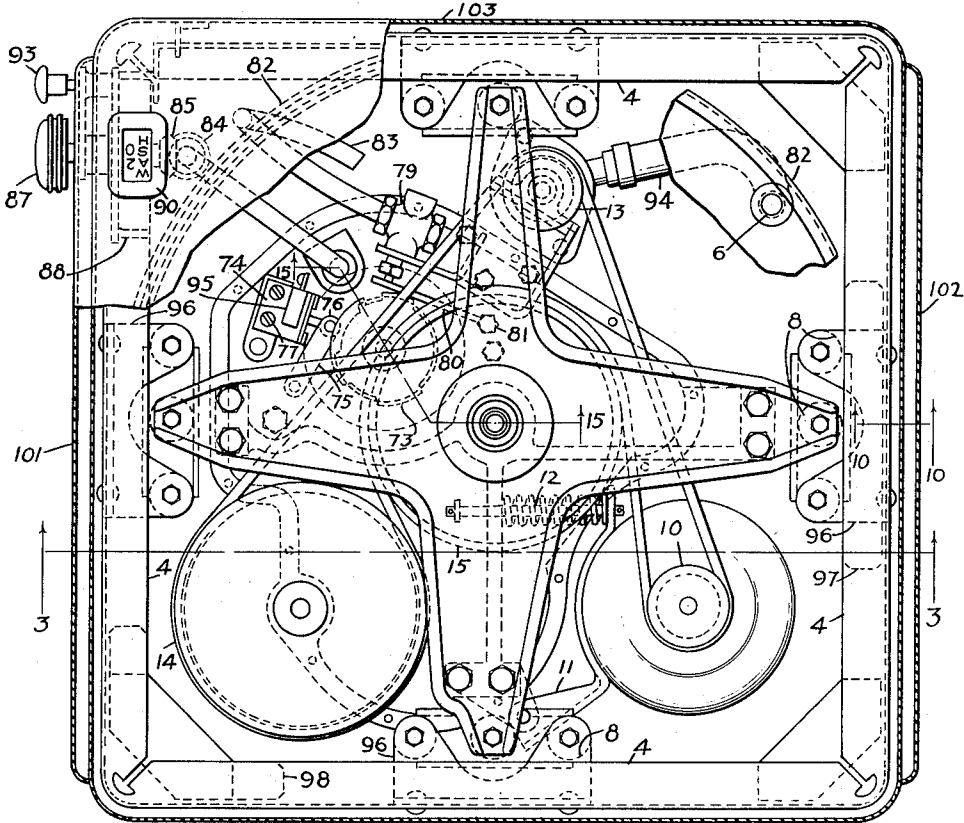


FIG. 1

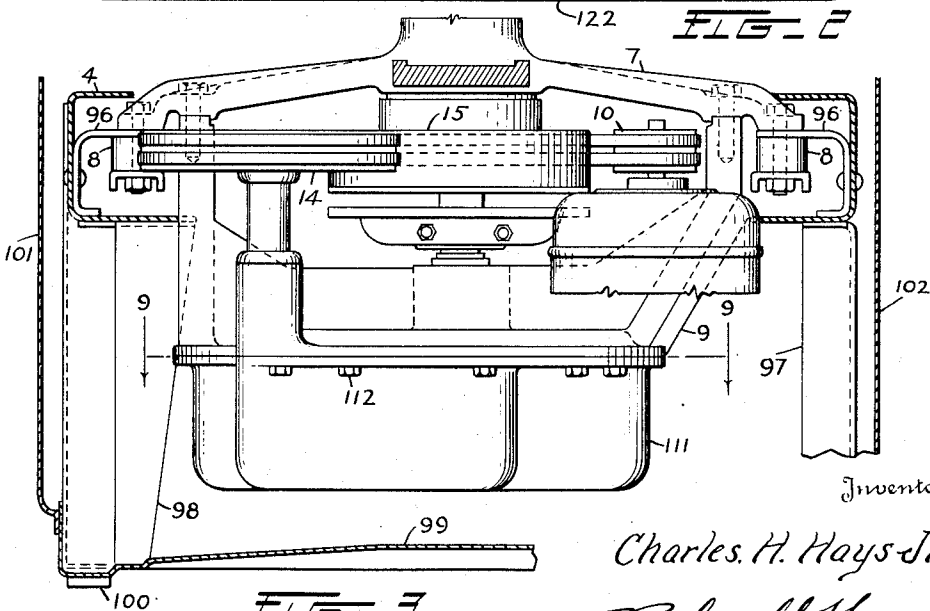


FIG. 2

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LAUNDERING MACHINE

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7 Sheets-Sheet 3

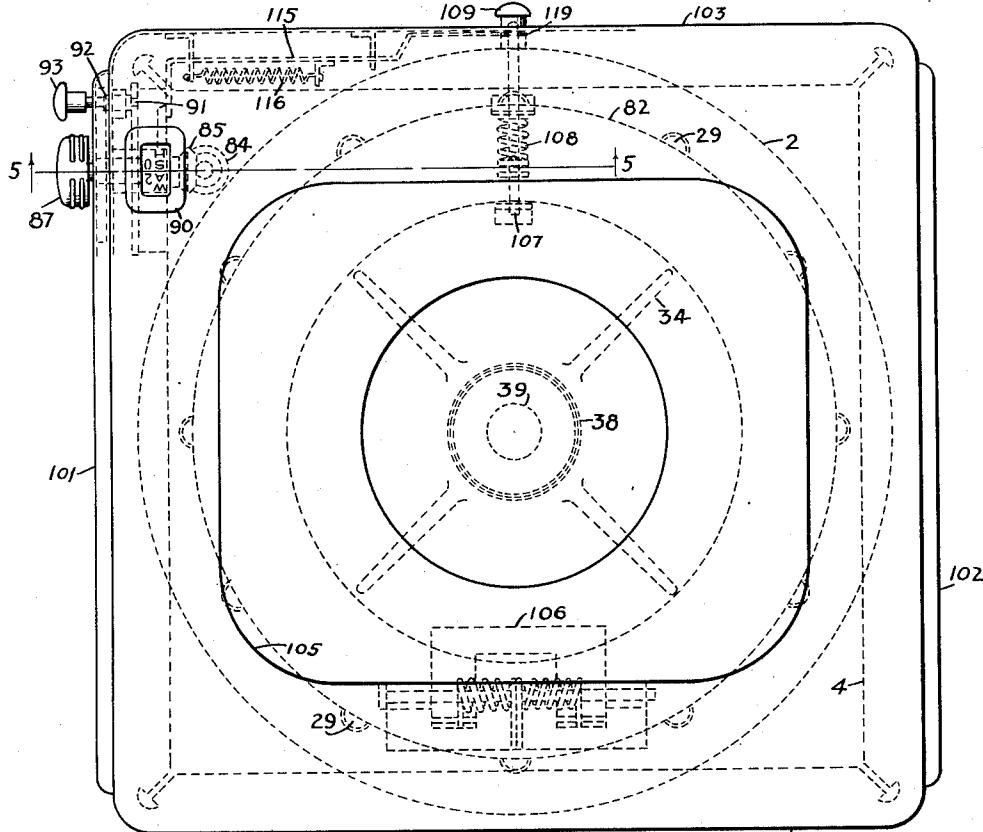


FIG. 4

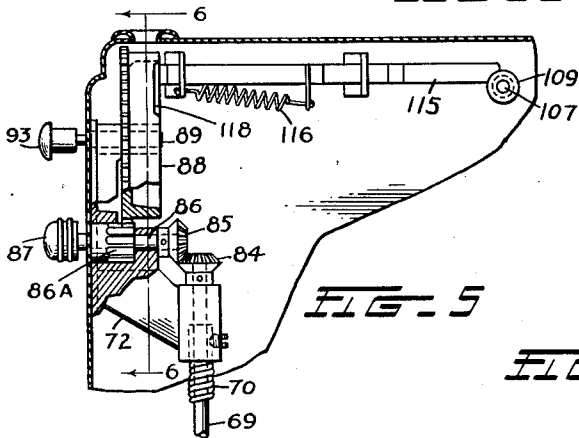


FIG. 5

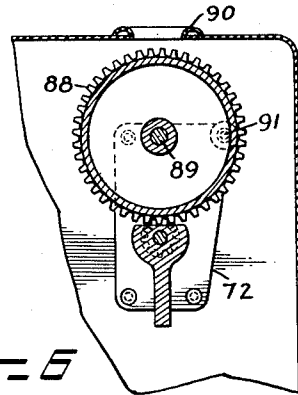


FIG. 6

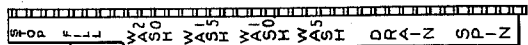


FIG. 21

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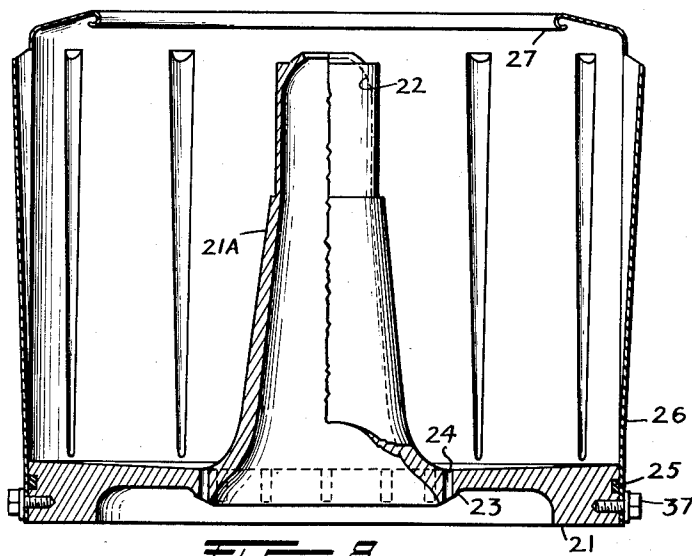
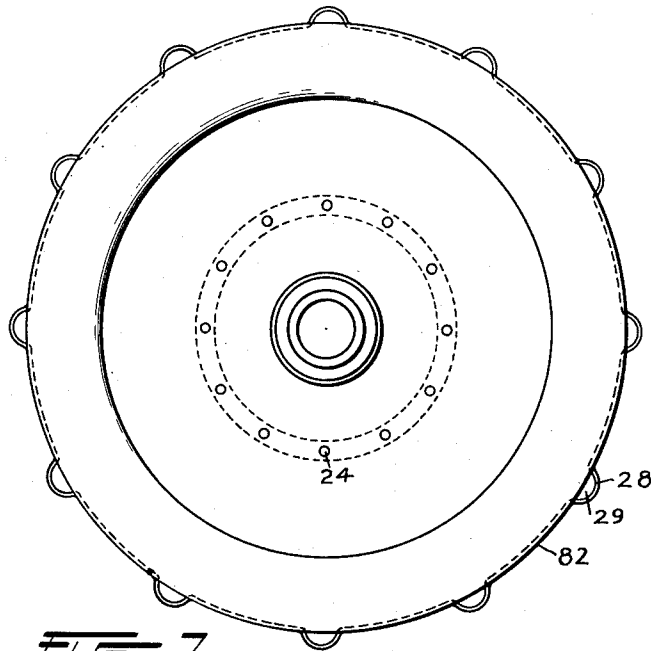
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7 Sheets-Sheet 4



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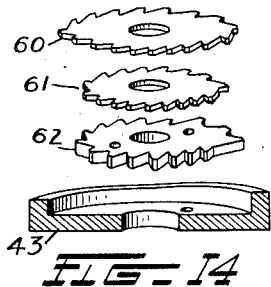
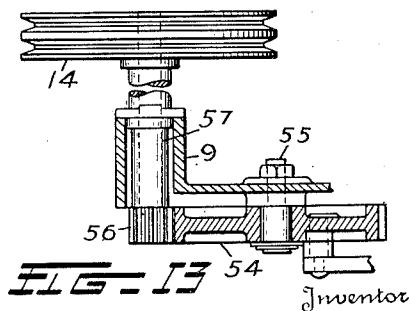
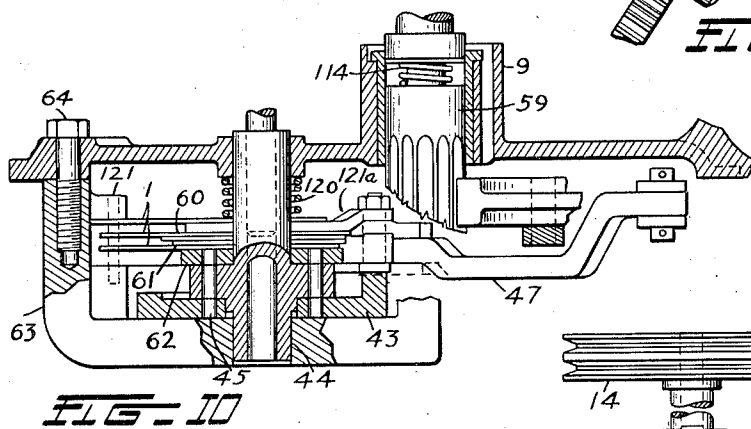
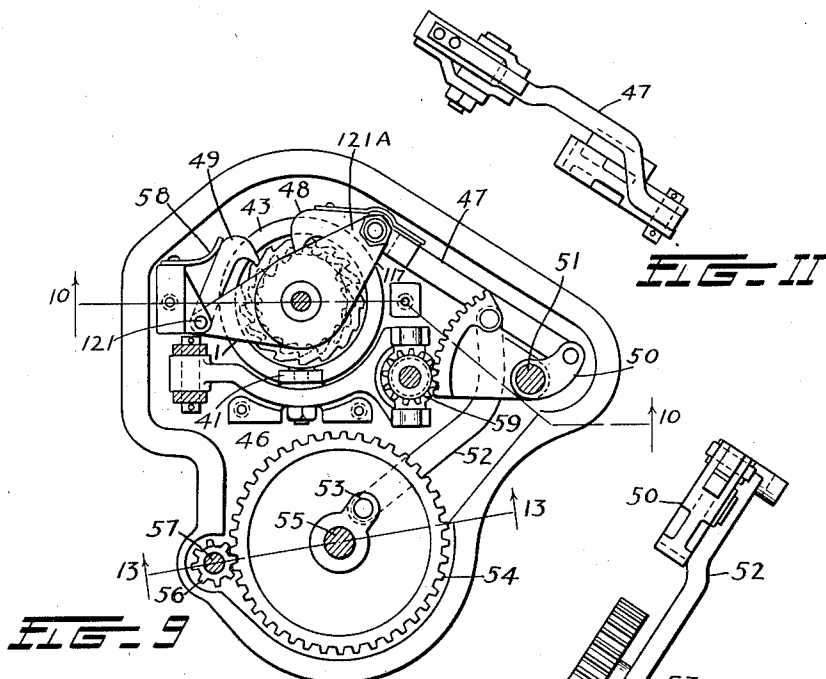
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LAUNDERING MACHINE

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7 Sheets-Sheet 5



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LAUNDERING MACHINE

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7 Sheets-Sheet 6

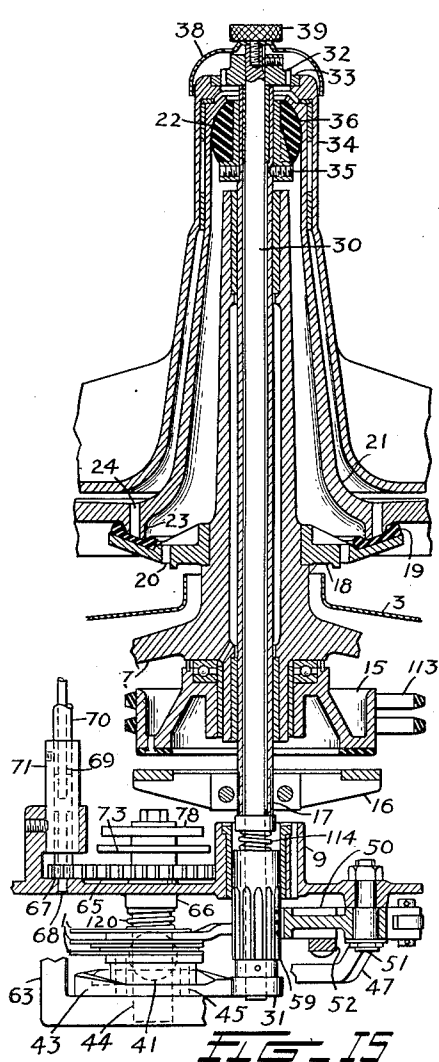


FIG. 15

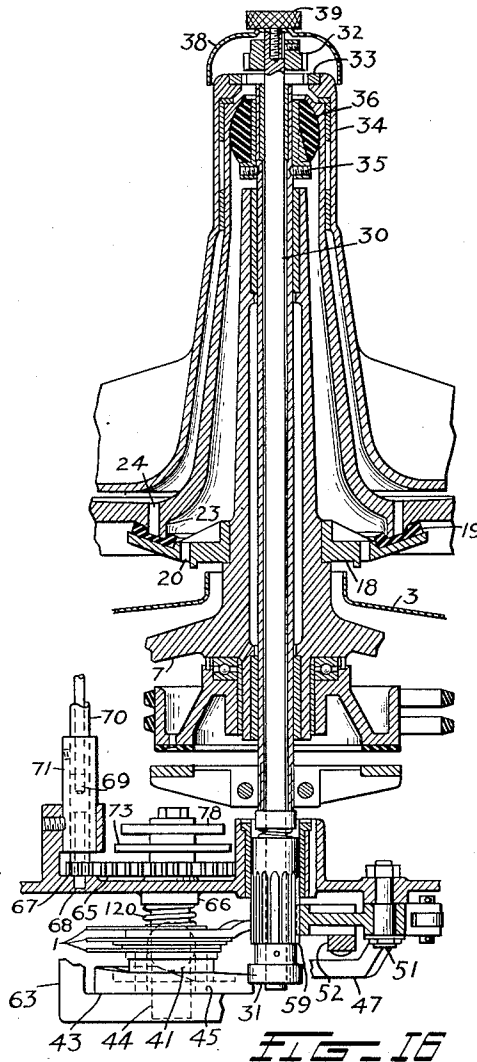


FIG. 16

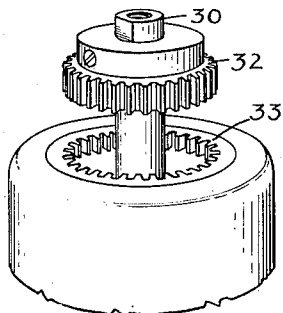


FIG. 20

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LAUNDERING MACHINE

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7 Sheets-Sheet 7

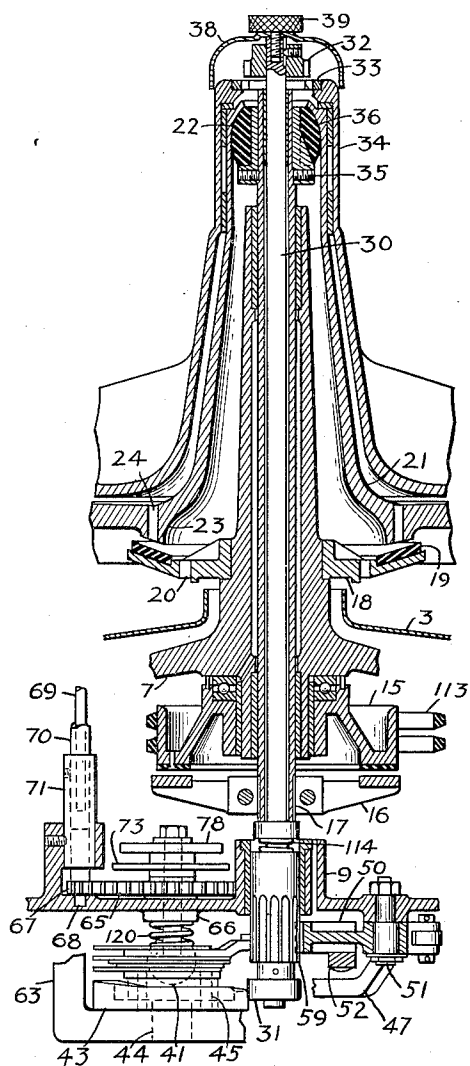


FIG. 17

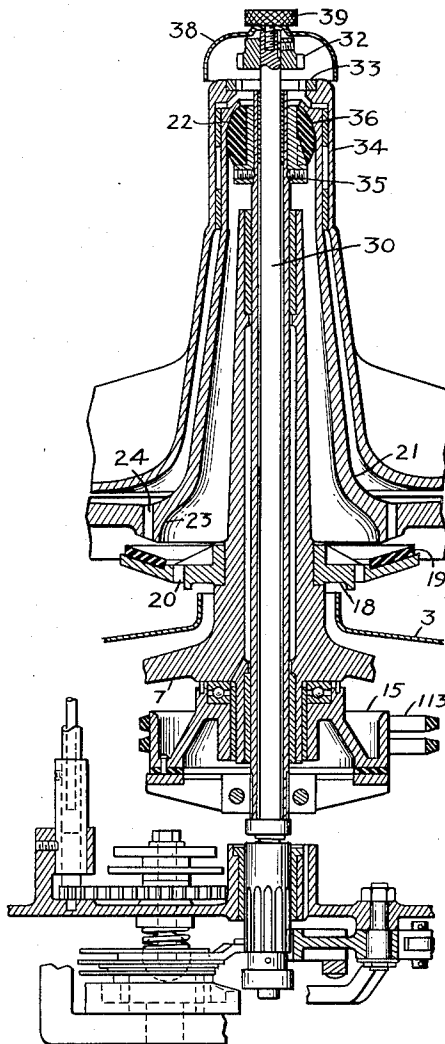


FIG. 18

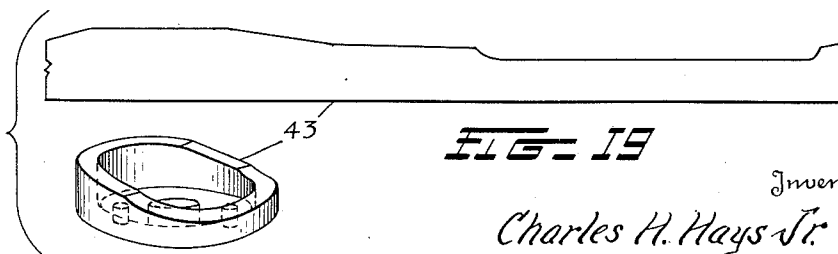


FIG. 19

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UNITED STATES PATENT OFFICE

2,361,767

LAUNDERING MACHINE

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Application December 4, 1939, Serial No. 307,397

21 Claims. (Cl. 68—23)

This invention relates to an apparatus for cleaning or laundering textiles, and is described hereafter as a machine for washing, rinsing and water extraction.

The various benefits and advantages of the machine hereinafter described may be secured either by manual controls or automatic sequential controls. The advantages of such controlled machines are, of course, obvious in the saving of time and labor to the operator, and the uniform quality of work obtained.

Machines for automatic washing, rinsing and extracting have heretofore contained a number of disadvantages which have seriously limited their use. Among these disadvantages have been the necessity for fastening the machine securely to a heavy floor, frequent clogging of the outlets and valves in the lines leading to the sewer, excessive vibration, and such machines have been impractical, if not impossible, to clean out after the laundering process has taken place in the machine. Furthermore, automatic sequential operation in domestic laundry machines is comparatively new, and although the present invention is susceptible to manual operation, it has been found preferable to describe and illustrate it in the most modern form; namely, with automatic sequential control.

Until the present invention, these disadvantages have presented an insurmountable obstacle to the widespread use of such automatic laundering apparatus.

It is common practice to wash by agitating the textiles in a volume of liquid, and to extract the liquid therefrom by means of centrifugal extraction. The difficulty arises in making the transfer from the agitating action to the extracting action, whether by manual or automatic control, both of which are usually carried out in a common container.

In machines now in use for automatic laundering, the textiles are frequently carried into the extracting operation in such a manner that substantially greater weight of the wet textiles is on one side of the container than at other points. This out of balance condition causes the machine to vibrate excessively and makes it necessary to use extremely low speeds for the extracting process, resulting in poor and incomplete extraction, and to, even then, securely affix the device to a heavy floor or to a large block of concrete to make the machine operable.

Another disadvantage of some types of such automatic laundering machines is the necessity for

a complete dismantling by an experienced mechanic every time it is necessary to clean the machine after a series of laundering processes. The lime, soaps and minerals precipitated from the water, greases and fats from the textiles and the detergents are deposited on the inner surface of such machine, presenting a very serious problem.

Lint and fluff from the textiles, treated in present day machines, continually clog the outlets and valves in the sewer lines, causing innumerable floods and making a disagreeable, if not impossible, problem for the operator.

One of the important features of the present invention is the provision of a new combination of apparatus for the washing, rinsing and extraction, so arranged, that any out of balance condition existing at the time when the machine ceases the washing or rinsing action and starts the extraction action, is automatically compensated, thereby eliminating vibration, permitting higher extracting speeds, with consequent more complete, more satisfactory, and more efficient extraction, doing away entirely with the necessity for affixing the machine to the floor.

Another object of the present invention is the elimination of the troublesome and unsanitary tub or stationary container for liquids, and the traps, screens, valves and other apparatus commonly associated with such detergent containers.

Another object is to provide an apparatus which can be readily cleaned by the operator after each use, without the necessity of tearing the machine apart.

Another object is to provide means for removing all of the foreign matter and the detergent with a brief rinsing sequence, requiring little time and liquid.

Another object is to provide a machine which will be simple and safe to operate even in the hands of unskilled operators with no previous knowledge or experience in the use of laundering devices.

Further objects and advantages will be apparent from the description following.

To accomplish the foregoing and related objects, the invention consists of the sequential process and means, whether automatic or manual, hereinafter fully described and claimed. The annexed drawings and the following description set forth in detail one practical method and construction for such apparatus.

Fig. 1 is a vertical sectional view taken through the center of a machine embodying one form of the invention.

Fig. 2 is a plan view showing the outline of the machine, the location of the internal mechanism, the mechanism supports, the arrangement for mounting the motor and belt drive which provide power to the different units.

Fig. 3 is a partial vertical sectional view and side elevational view, being taken on line 3—3 of Fig. 2, showing the gear case and the support and elevation of the power drive.

Fig. 4 is a plan view showing the location of the control handle, the material container, the agitator and the cabinet lid.

Fig. 5 is a section taken through the line 5—5 of Fig. 4, showing the control handle and the dial which indicates the various processes or operations of the machine, and the interlock for the lid.

Fig. 6 is a section taken on line 6—6 of Fig. 5 of the control handle mechanism.

Fig. 7 is a plan view of the material container showing the location and shape of the liquid ejector flutes on the outer wall of the container, and the drain holes near the center at the bottom of the container.

Fig. 8 is a vertical sectional view taken through the center of the material container, substantially as shown in Fig. 7, and discloses the outer wall construction and liquid ejector flutes, the stabilizer forming the bottom of the material container, and the drain holes in the bottom of the material container.

Fig. 9 is a horizontal sectional view of the gear case being taken on line 9—9 of Fig. 3, showing the driving pinion and gear, the agitator drive, the segment gear connection to the ratchet timer clutch for the automatic timing mechanism, the timer cam, the rocker arm, and the central pinion which imparts the oscillating movement to the shaft of the agitator.

Fig. 10 is a vertical sectional view taken on line 10—10 of Fig. 9, through the ratchet clutch for the timing mechanism and the power connection for said clutch.

Fig. 11 is a side elevational view of the timer drive link.

Fig. 12 is a side elevational view of the segment gear drive rod.

Fig. 13 is a vertical sectional view on line 13—13 of Fig. 9 showing the drive pinion and gear.

Fig. 14 is an exploded view of the timer ratchet clutch plates and the timer cam.

Figs. 15, 16, 17 and 18 are fragmentary vertical sectional views through line 15—15 of Fig. 2, showing the position of the various parts as said positions are altered during the sequence of operations comprising the automatic laundering process described hereinafter.

Fig. 19 is a perspective and development view of the timer cam.

Fig. 20 is a perspective view of the agitator drive clutch.

Fig. 21 is a developed view of the surface of the indicating dial.

Referring to Fig. 1, it will be seen that the design illustrated consists of a circular sheet metal splash ring 2 with a dished bottom member 3, mounted on a channel section frame 4, with a plurality of rests 5 of a flexible material such as rubber, with an opening of suitable size through the bottom 3, through which a vertical column extends. There is an outlet 6 near the rim of the bottom 3, affording a drain to the sewer by means of drain tube 94 and pump 13.

A frame member 7, having a plurality of arms

mounted on flexible rubber supports 8, attaches to subframe 4, through the medium of brackets 96. The center section of frame 7 comprises a rigid central bearing 1a journaled at both ends and having a tubular column 7b extending vertically upward, and a hub 7c extending downward. An irregular member 9 comprising the gear mounting plate and supporting legs is detachably bolted with bolts 110 to frame 7. An oil pan 111 is secured with screws 112, forming a sealed chamber in which the main gears and other mechanism operate in a lubricating bath.

Rotatably mounted on the tubular shaft 17, centrally supported by the column of frame 7, is a heavy stabilizer member 21, which in the design illustrated forms the bottom of the material container 82, but which could equally well be attached to the material container. The stabilizer 21 has a centrally disposed upwardly extending column 21a. In the top of this column is a finished spherical surface 22 that serves as a seat for the driving member hereinafter more fully explained.

Stabilizer 21 is of sufficient cross section and weight to properly counteract the effect of out of balance forces created by masses of material located in the material container 82, when the material container is rotated at a high speed. Near the center and the bottom of stabilizer 21 is a ring 23 formed to extend downwardly, and having an approximately spherical surface designed to rest on top of the surface of gasket 19 on gasket support member 18 which is attached to frame 7. Ring 23, gasket 19 and gasket support member 18, having a plurality of drain holes 20, form a valve-like connection, permitting the opening and closing of a plurality of holes 24, said holes extending through stabilizer 21 to permit material container 82 to hold a liquid, or to permit such liquid to be emptied, as desired.

On the outer surface of the circumference of stabilizer 21 is a groove containing packing 25 of such form as to make a liquid tight joint between said surface and the outer wall 26 of the material container 82. The outer wall 26 is a suitable non-corrosive sheet metal ring designed to encircle stabilizer 21, and extending upwardly sufficiently high to contain the desired quantity of textiles and liquid.

A plurality of screws 37, located around the circumference of stabilizer 21 and outer wall 26, securely binds and seals the two together. The upper end of the outer wall 26 of the material container 82 is turned inward to make a smaller diameter opening for loading the material to be laundered. Around said opening, for purposes of safety, is a smooth rolled edge or bead 27.

Equally spaced around the wall 26 of the material container 82, are tapered flutes 28 of half round form (see Figs. 7 and 8), the wall 26 being pierced at the top of the flutes creating openings 29 through which liquid is ejected when the material container is revolved at high speed.

The material container 82 is connected with and mounted on a pedestal assembly which is centrally located. In the pedestal assembly there are two drive shafts, one a tubular shaft 17, and the second an inner shaft 30, which is supported on a thrust bearing attached to a trunnion arm 31. Shaft 30 extends vertically through shaft 17, near the top end of shaft 30 is keyed a gear 32 which meshes with internal gear 33, fixed to agitator 34 to form a positive sliding clutch (further illustrated in Fig. 20), which drives the agitator 34. Agitator 34 is journaled on the top of the column of stabilizer 21. On the upper end of the tubu-

lar shaft 17 is securely affixed a hub 35 on which is mounted a splined rubber ball 36, the outside surface of which fits snugly against the spherical internal surface 22 of the top of the column 21a of stabilizer 21. On the lower end of shaft 17 is adjustably clamped a clutch plate 16, which is engageable with clutch pulley 15.

The upper end of shaft 30 is threaded and a cup or cover 38 fits freely over the upper end of the hub of agitator 34, providing a smoothly finished, neat appearing cover serving to retain the agitator and which can be removed by a knurled hand screw 39.

The trunnion arm 31 is suspended on the support 40 in a horizontal manner with a roller 41 on a stud 42, located centrally between the bearing ends.

The roller is in constant contact with the surface of cam 43, which is driven by shaft 44 through pins 45 and through the timing ratchet clutch group 46. The timing ratchet clutch group receives its power through a link 47 and pawl 48, held by the bottom one of three restraining dogs 49. The ratchet clutch has an intermittent rotary motion of an escapement nature through the link 47, attached to the segment gear 50, mounted on stud 51, and driven by lever 52. Lever 52 is attached by stud 53 to gear 54, which runs continuously supported by stud 55.

Gear 54 is driven by pinion 56 from shaft 57. The entire above described mechanism, commencing with the trunnion arm 31 to and including the shaft 57, is located within the gear case. The pinion shaft extends upward and through the gear mounting plate 9, to which is attached a double V belt pulley 14.

Segment gear 50 has an oscillatory motion and remains in constant mesh with pinion 59, which is secured to shaft 30, extending upward vertically through tubular shaft 17. Shaft 30, at its upper end, imparts the oscillatory motion to the agitator 34 through clutch gears 32 and 33. Clutch gears 32 and 33 are held in an engaged position by spring 114, which is located between the pinion 59 and the end of the tubular shaft 17.

The timing ratchet clutch group 46 providing the automatic sequential operation of the machine is shown in plan view in Fig. 9; in section in Fig. 10; and Fig. 14 shows the principal elements separated. The number of teeth on the ratchet plates, their depth and their arrangement determine the relative length of time of each event in the sequence of operations.

Operation of the timing ratchet clutch group 46 is as follows: The top plate 60 is of suitable diameter and has cut into its periphery a number of teeth, one of which being deeper than the others, and of sufficient depth to permit pawl 48 to fully engage a normal tooth on the bottom plate 62.

The center plate 61 is of slightly smaller diameter than the roots of the normal teeth of plate 60 and has cut into its periphery the same number of equally spaced teeth as plate 60, all of equal depth except one tooth which is of sufficient depth that the pawl 48 may fully engage a normal tooth on the bottom plate 62.

The bottom plate 62 is of slightly smaller diameter than the roots of the normal teeth of plate 61 and has cut into its periphery the same number of equally spaced teeth as plate 60. One or more of these teeth shall have crests extended to be flush with the outer diameter of plate 60. All the teeth of plate 62 have the same root diameter.

Plates 60 and 61 have a central hole of such

diameter that they may rotate freely about the hub shaft 44. Plate 62 has a central hole to accommodate hub shaft 44 and dowel holes for pins 45 by means of which motion of plate 62 is transmitted to hub shaft 44 and cam 43.

Between ratchet plates 60, 61 and 62 and on top of ratchet plate 60 are friction plates 1 to prevent motion of one ratchet plate being transferred to an adjacent ratchet plate. These friction plates are prevented from turning by pin 121 which also serves as a hinge point for dogs 49, which engage ratchet plates 60, 61, and 62, and prevent reverse rotation. Pressure of dogs 49 against ratchet plates 60, 61 and 62 is maintained by springs 58. The assembled ratchet plates 60, 61 and 62, pawl guide plate 121a, and friction plates 1 are held in position by means of spring 120 bearing between journal 66 (Figs. 15, 16, 17 and 18) and top friction plate 1.

Operation of the machine causes reciprocation of link 47 and pawl 48, supported and guided by pawl guide plate 121a, which in turn advances ratchet plate 60 one tooth at a time until the deep tooth is reached, whereupon the pawl 48 is permitted to engage a tooth in ratchet plate 61. In this manner, ratchet plate 61 is advanced until the deep tooth is engaged on both ratchet plates 60 and 61 by the pawl 48, whereupon the pawl 48 engages a tooth on ratchet plate 62 and the entire ratchet clutch group 46, consisting of ratchet plates 60, 61 and 62, through hub shaft 44, and the cam 43 is rotated a space equal to one ratchet plate tooth space, and is then held by dogs 49.

This sequence continues until the long teeth on ratchet plate 62 are brought into position to be engaged by pawl 48, whereupon the ratchet clutch group 46 will be advanced as many tooth spaces as there are long teeth on ratchet plate 62 by successive strokes of the pawl.

This rapid advance over a portion of the entire rotation is of great advantage during the change from rinse to drain as hereinafter explained.

Hub shaft 44 rotates in and is located by journal 66 in member 9, and part 63 fastened by means of screws 64 to member 9. Rotation of cam 43 causes its irregular surface (Fig. 19) to actuate roller 41 which, by means of pin 42 (Fig. 1), causes arm and trunnion 31 to impart a vertical motion to shaft 30 and the parts fastened thereto; namely, pinion 59, male gear clutch member 32, and cover 38.

As shown in Fig. 15, gear 65 is fastened to hub shaft 44 and meshes with pinion 67, located by bearing 68 and sleeve 71, and driven by flexible cable 69 operating within flexible tube 70. Adjacent to gear 65 and also fastened to hub shaft 44 are cams 73 and 78. Cam 73 through roller 76 mounted on arm 75 (Fig. 2) operates an electric switch 95 mounted on bracket 74, held by screws 77. This switch controls operation of the motor 10.

Cam 78 bears on lever 80, hinged on pin 81, and thus operates valve 79, controlling the flow of liquid through tube 83 into container 82, as required.

In Figs. 5 and 6, bracket 72 locates the upper ends of flexible cable 69 and flexible tube 70. Affixed to flexible shaft 69 is a miter gear 84, meshing with another miter gear 85, which is fastened to shaft 86 running in bracket 72, that is secured to the upper part of the cabinet side 101. Shaft 86 extends through the cabinet side 101 and mounts an operating handle 87, through rotation of which the machine may be set to the

operation desired. Thus through the sequence of the handle 87, shaft 86, miter gears 85 and 84, flexible shaft 69, pinion 67 (Fig. 15), gear 65, and finally hub shaft 44, cam 78, cam 73, and the cam 43 may be set to the required position for the operation desired. Likewise, the operation of the machine rotates this shaft 86.

Integral with shaft 86 is formed a pinion 86a which meshes with a gear on the rim of dial 88, rotatable on pin 89 affixed to bracket 72. On the face of the rim of dial 88 are printed the various stages of the sequential operation and by means of a transparent window 90 in the cabinet top 104, an observer may witness the point of the cycle at which the machine is operating. In the face of dial 88 is a hole which is engaged by plunger 91, actuated by spring 92. When the operator wishes to fill the container 82 with liquid preliminary to the washing operation, the dial 88 is rotated by means of pinion shaft 86 and handle 87 until the plunger 91 engages the hole in dial 88 due to spring 92. This serves as an automatic stop at the proper point to cause cam 78 to open liquid valve 79. When the container 82 has been filled to the desired level, the knob 93 is pulled, withdrawing plunger 91, and thus releasing dial 88 for further rotation by means of pinion shaft 86 and handle 87.

On the edge of the dial rim is formed a cam surface 118 (Fig. 21) which actuates a sliding bar 115 in one direction, the bar being returned by spring 116. This bar 115, cam surface 118, and groove 119 in latch pin 107 serve to make inoperable latch pin 107 during the extracting operation thereby preventing swinging lid 105 about its hinges 106, into open position and eliminating any danger to the operator. Latch pin 107 is actuated by means of spring 108 and may ordinarily be withdrawn by pulling knob 109 which extends through cabinet front 103.

The mechanism is empowered by a motor 10 (Fig. 2 and Fig. 3) suspended by hinged bracket 11 with spring 12 providing tension in V belts 113, which transfer movement to main clutch pulley 15, waste pump 13, and pinion pulley 14.

The entire mechanism is suitably supported through channel frame 4 and legs 97 and 98 (Fig. 3) to the bottom of which are affixed pads 100 and pan 99 to provide bracing and serve as a dirt catch. Further, the mechanism is enclosed both for appearance and safety of the operator by a cabinet (Figs. 1, 2, 3 and 4) attached to legs 97 and 98 and formed of sides 101, 102, 103, top 104 and lid 105. Back 122 is readily removable for inspection and adjustment of mechanism.

The operation of the device as a washing and extracting machine is as follows:

Rotation of control knob 87 turns dial 88 to the fill position where it is locked by plunger 91; rotates cam 43 and thus lowers container 82 onto seat 19 and seals the container; lowers clutch gear 32 into clutch gear 33; opens valve 79, filling container 82 with liquid and indicates by the dial 88, observable through the window 90, that the machine is in the fill position.

While container 82 is being filled to desired level by liquid, the operator may add soap or other cleaning agent as desired.

Withdrawal of knob 93 permits further rotation of knob 87, which shuts off valve 79; operates switch 95, starting the motor and thus beginning oscillatory motion of agitator 34; moves dial 88 to position, indicating that the machine is in wash position. Sufficient time is allowed for

thorough mixing, then lid 105 is opened by means of knob 109 operating latch rod 107, and the material to be washed is introduced into container 82 and the lid closed. Knob 87 is then turned until desired wash time (Fig. 21) is indicated on dial 88. From this point, the remainder of the sequence of operation is automatic, and the relation of the various parts is that illustrated in Fig. 15.

Continued operation of the machine advances the ratchet timer group 46, as explained hereinbefore, through the preset wash interval, then through the first rinse period, whereupon valve 79 is again opened by cam 78, permitting liquid to enter container 82 and overflow the openings 29 and, if necessary, the rim 27, such overflow being caught by splash ring 2, conducted through pipe 6, tube 94, and expelled by pump 13 to discharge.

After a suitable agitated overflow rinse period as determined by the configuration of cam 78, the valve 79 closes and cam 43 causes shafts 17 and 30 to rise, producing a relative position of parts illustrated in Fig. 17 and resulting in clutch gear 32 disengaging itself from clutch gear 33, thereby causing cessation of motion in agitator 34; lifting of container 82 from seat 19 and permitting escape of liquid through holes 24 and 20; and causing dial 88 to indicate the drain period.

After a suitable interval, continued rotation of cam 43 results in shafts 17 and 30 moving further upward into position illustrated by Fig. 18 and resulting in engagement of clutch members 15 and 16; rapid rotation of container 82; extraction of liquid from material in container, and consequent expulsion by centrifugal force through flutes 28 and openings 29 into splash ring 2, whence it drains and is expelled as explained hereinbefore. It also causes the spin or extraction period to be indicated by dial 88, and the cam thereon (118, Fig. 21) to secure lid latch 107 against being opened.

While spinning, and after a suitable interval, cam 78 causes valve 79 to admit a quantity of liquid for a second rinse into container 82, which is likewise extracted and expelled, insuring thorough rinsing.

Spinning now continues for a sufficient length of time to secure the desired degree of extraction, whereupon cam 43 causes shafts 17 and 30 to assume the positions illustrated in Fig. 17, so that the agitator 34 is disengaged; the container 82 is suspended free of seat 19 to permit cleaning and draining, and switch 95 is off and valve 79 is closed. The dial 88 now indicates stop.

Particular attention is called to two features of this device: namely, the supports under member 7 and the resilient support 36 for container 82.

Member 7 is supported from bracket 96 by resilient blocks 8 so that each of its plurality of arms has blocks 8 in both tension and compression, contributing greatly to the damping or smothering and absorption of any vibration in the mechanism.

Container 82 is suspended by means of spherical seat 22 from resilient ball 36 which is splined to hub 35. This provides, by means of splines on 35 and 36, and the high frictional contact between ball 36 and seat 22 a positive yet flexible drive for container 82. This permits any eccentric loading condition of the material in container 82 to be compensated for by the freedom provided at the ball.

In addition to this action, whereby the center of gravity of the entire mass consisting of con-

tainer 82 and the material being cleaned is permitted to coincide with the axis of rotation, the weight of the stabilizer ring 21 greatly reduces the effect of any eccentric loading and produces smoother performance during spinning, due to its pronounced gyroscopic action.

It is of course entirely within the scope of this invention that the automatic features of this invention could be eliminated, and the machine be made to operate entirely by manual control. This would result in some degree of simplification of the machine, although operation would not be as convenient, nor would results be so satisfactory. Furthermore, as previously stated, this is not generally the modern practice.

Although I have shown and described only one form of my invention, it will be understood by those skilled in the art that variations or modifications are within contemplation of the invention insofar as such modifications or variations are within the scope of the hereunto annexed claims.

Having thus described my invention, I claim:

1. In a cleaning machine, a rotatable receptacle, an agitator freely journaled in said receptacle, a drive member having connection with said agitator above the center of mass of said receptacle, means for rotating said receptacle, said agitator and said receptacle being selectively operable, means fixedly supporting said receptacle, and further means for moving said receptacle out of engagement with said means and disengaging said agitator from said drive member whereby to free said receptacle for rotation and render said agitator incapable of driven operation.

2. In a cleaning machine, a rotatable receptacle, means for rotating said receptacle, means for fixedly mounting said receptacle, an agitator in said receptacle, an axially movable agitator drive shaft, and means operable to move said shaft to become disengaged from said agitator, said means also serving to free said receptacle from the mounting means for rotation.

3. In a cleaning machine, a rotatable receptacle for holding both the material to be cleaned and a cleaning fluid, an agitator mounted in said receptacle, a support for said receptacle, a pair of concentrically disposed driving members mounted in said support, one of said members serving to oscillate said agitator, the other of said members serving to rotate said receptacle, a disengaging device for the member adapted to cause oscillation of said agitator, and a universally rockable connection between the other of said members and said receptacle, said disengaging device and said rockable connection being located above the center of mass of said agitator and said receptacle.

4. In a cleaning machine, a rotatable receptacle for holding both the material to be cleaned and a cleaning fluid, an upstanding circular column disposed centrally of the base of said receptacle, said base adjacent said column being apertured to provide fluid egress from said receptacle, a fixed support, said support being of an area and contour to fluid seal the openings in said base and firmly support said receptacle, an agitator, the central portion of said agitator being contoured to enclose said column, a pair of concentric driving members mounted in said support, one of said members serving to oscillate said agitator, the other of said members serving to rotate said receptacle, and means operable to disengage said agitator from its driving member

and raise said receptacle from said support whereby to permit fluid passage from said receptacle through said opening.

5. In a cleaning machine, a receptacle for holding both the material to be cleaned and a cleaning fluid, an agitator mounted in and freely journaled on said receptacle, said agitator comprising an upstanding hollow central portion, a drive shaft projecting upwardly through said hollow portion, co-operative means at adjacent ends of said portion and said shaft, said means being operable to engage and disengage said agitator with said shaft by axial movement of said shaft, and means for axially moving said shaft.

6. In a cleaning machine, the combination of a rotatable receptacle for holding both the material to be cleaned and the cleaning fluid, a support for fixedly mounting said receptacle, an agitator freely journaled in said receptacle, a drive mechanism, said mechanism including drive members for separately oscillating said agitator and rotating said receptacle, said drive members being mounted centrally of said support, means for universally rockably connecting said receptacle to one of said drive members, and further means disengageably connecting said agitator with the other of said drive members.

7. In a cleaning machine, a rotatable receptacle having base apertures, a support fixedly seating said receptacle and closing said apertures, an agitator freely journaled in said receptacle, an axially movable agitator drive member projecting centrally through said receptacle, means operable to move said drive member to become disengaged from said agitator, said means also serving to unseat said receptacle from said support and open said apertures.

8. In a cleaning machine, a rotatable receptacle, a support for fixedly mounting said receptacle, an agitator freely journaled in said receptacle, a pair of axially movable drive members, one of said members being adapted for operative connection with said agitator and the other of said members being adapted for operative connection with said receptacle, and means operable to successively disengage one of said members from said agitator and cause the other of said members to raise and free said receptacle from said support for rotation by simultaneous movement of said drive members.

9. In a cleaning machine, a rotatable receptacle, a support for fixedly mounting said receptacle, an agitator freely journaled in said receptacle, a pair of concentric drive members projecting through said support, one of said members being adapted for operative engagement with and serving to oscillate said agitator, the other of said members being adapted for operative engagement with and serving to rotate said receptacle, means operable to move one of said members to disengage said agitator, said means also functioning to move the other of said members and free said receptacle from said support for rotation.

10. In a cleaning machine, a rotatable receptacle for holding both the material to be cleaned and a cleaning fluid, an upstanding circular column disposed centrally of the base of said receptacle, said base being apertured to provide fluid egress from said receptacle, a fixed portion of said machine serving to support said receptacle and having an area and contour to fluid-seal the base opening when said receptacle rests upon said support, an agitator in said receptacle, an axially movable agitator drive shaft, means operable to

move said shaft to become disengaged from said agitator, said means also serving to raise said receptacle from said support to permit fluid passage therefrom and free rotation thereof.

11. In a cleaning machine, a rotatable receptacle having upstanding side walls and a base, an upstanding circular column centrally of said base, said column being of a height substantially that of said side walls, an agitator in said receptacle, a central portion of said agitator being contoured to enclose said column, means freely journaling the central portion of said agitator on said column, drive means beneath said receptacle including a drive member projecting into said column and adapted to actuate said agitator, and a further drive member projecting into said column, universally rockable means mounting said column on said further member, said rockable means being located at the upper end of said column whereby to cause the combined center of mass of said receptacle and said agitator to be therebeneath.

12. In a cleaning machine, a rotatable receptacle, an upstanding circular column disposed centrally of the base of said receptacle, a support for fixedly mounting said receptacle, an agitator freely journaled in said receptacle, the central portion of said agitator being contoured to enclose said column, a pair of concentric drive members projecting through said support, one of said members serving to oscillate said agitator, the other of said members serving to rotate said receptacle, and means operable to disengage said agitator from its driving member and raise said receptacle from said support whereby to free said receptacle for rotation.

13. In a cleaning machine, a rotatable receptacle for holding material to be cleaned and cleaning fluid, an agitator mounted in and freely journaled on said receptacle, a support for fixedly mounting said receptacle, an axially movable drive member for said receptacle projecting through said support, a universally rockable connection between said member and said receptacle, a device for moving said member and elevating said receptacle from said support, said receptacle and agitator, when said receptacle is elevated, being supported solely by said rockable connection, said rockable connection being located above the center of mass of said receptacle, said agitator, and any material and fluid contained in said receptacle.

14. In a cleaning machine, a rotatable receptacle for holding material to be cleaned and cleaning fluid, an agitator freely journaled in said receptacle, axially movable concentric drive members, one of said members being movable to engage and operatively connect said agitator with a suitable oscillating mechanism, universally rockable means connecting said receptacle with the other of said members, and further means operable to move said members to disconnect said agitator and cause said rockable means to sustain said receptacle in a manner and location such that the combined center of mass of said receptacle, said agitator, material to be cleaned and cleaning fluid will approximately coincide with the vertical center line through the point of support for said mass when said receptacle is rotated at a relatively high speed.

15. In a cleaning machine, a rotatable receptacle for holding both the material to be cleaned and a cleaning fluid, an agitator freely journaled in said receptacle, a support for said receptacle, a shaft projecting upwardly through said support,

universally rockable means adapted to serve as a support for said receptacle, means operable to optionally render said agitator oscillatable and freely rotatable, said last mentioned means serving to displace said receptacle from said support and cause said rockable means to serve as the sole support of said receptacle when said agitator is freely rotatable, the combined center of mass of said receptacle, said agitator, material to be cleaned, and cleaning fluid being adapted to approximately coincide with a vertical center line through the point of support for said mass on said universally rockable means when said agitator is rendered freely rotatable and said receptacle rotating at a relatively high speed.

16. In a cleaning machine, a rotatable receptacle for holding both the material to be cleaned and a cleaning fluid, a base portion of said receptacle having openings to provide fluid egress therefrom, a combined valve and support structure, the valve portion closing said openings when said receptacle derives its support from said structure, an agitator freely journaled in said receptacle, an axially movable agitator drive member located centrally of said receptacle, means operable to move said drive member to become disengaged from said agitator, and separate said receptacle from said combined valve and support structure and permit fluid egress from said receptacle through said openings.

17. In a cleaning machine, a rotatable receptacle for holding both the material to be cleaned and a cleaning fluid, an upstanding circular column disposed centrally of the base of said receptacle, said base adjacent said column being apertured to provide fluid egress from said receptacle, a fixed support, said support being of an area and contour to fluid seal the openings in said base and firmly support said receptacle, an agitator, the central portion of said agitator being contoured to enclose said column, a pair of concentric driving members mounted in said support, one of said members serving to oscillate said agitator, the other of said members serving to rotate said receptacle, and means operable to disengage said agitator from its driving member and relatively move and separate said receptacle and said support whereby to permit fluid egress from said receptacle, free rotation of said receptacle, and render said agitator incapable of driven operation.

18. In a cleaning machine, a rotatable receptacle, an agitator freely journaled in said receptacle, a drive member having connection with said agitator above the center of mass of said receptacle, means for rotating said receptacle, said means having connection with said receptacle above the center of mass thereof, said agitator and said receptacle being selectively operable, means fixedly supporting said receptacle, and further means for moving said receptacle out of engagement with said support means and disengaging said agitator from said drive member whereby to free said receptacle for rotation and render said agitator incapable of operation by said drive member.

19. In a cleaning machine having a rotatable receptacle for holding material to be cleaned and cleaning fluid and having an oscillatable agitator mounted in said receptacle, a reduction drive mechanism comprising a ratchet wheel group, a drive member operable to intermittently engage and rotate the wheels of said group, a cam member rotatable with the slow speed wheel of said group, means associated with said cam member,

said means having connection with said receptacle and being operable by said cam member to render said agitator inoperative and raise onto and support said receptacle in a position for rotation, and means forming a part of said group for increasing the speed of rotation of said cam member during the operation of raising said receptacle.

20. In a cleaning machine having a rotatable receptacle for holding material to be cleaned and cleaning fluid and having an oscillatable agitator mounted in said receptacle, concentrically mounted drive means for said receptacle and said agitator, a reduction drive mechanism comprising a ratchet wheel group, a drive member operable to intermittently engage and rotate the wheels of said group, means forming part of the wheels of said group for normally requiring said drive member to effect a predetermined sequential rotation of said wheels, a cam member rotatable with the slow speed wheel of said group, means associated with said cam member, said means having connection with said concentric drive means and being operable by said cam member to disengage the agitator drive means and raise and support said receptacle in a position for rotation by the receptacle drive means, and manual means operable independently of the drive member for rotating said cam member to

change the time period of operation of the receptacle and agitator.

21. In a cleaning machine having a rotatable receptacle for holding material to be cleaned and cleaning fluid and having an oscillatable agitator mounted in said receptacle, concentrically mounted drive means for said receptacle and said agitator, a reduction drive mechanism comprising a ratchet wheel group, a drive member operable to intermittently engage and rotate the wheels of said group, means forming part of the wheels of said group for normally requiring said drive member to effect a predetermined sequential rotation of said wheels, a cam member rotatable with the slow speed wheel of said group, means associated with said cam member, said means having connection with said concentric drive means and being operable by said cam member to disengage the agitator drive means and raise and support said receptacle in a position for rotation by the receptacle drive means, and means forming a part of said ratchet wheel group for increasing the speed of rotation of said cam member during the operation of disengaging said agitator drive means and raising said receptacle to a position for rotation by the receptacle drive means.

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