Aug. 7, 1934. J. B. KIRBY 1,969,178

LAUNDRY MACHINE

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Fig. 1

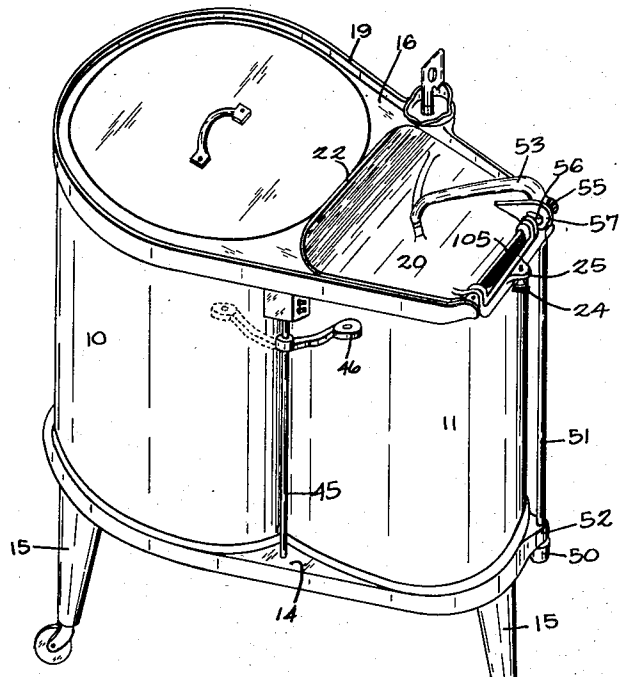


Fig. 2

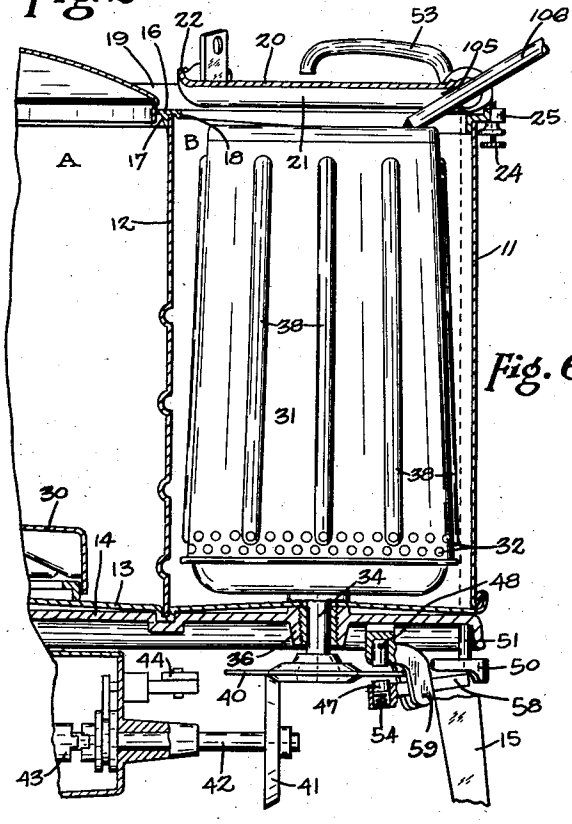
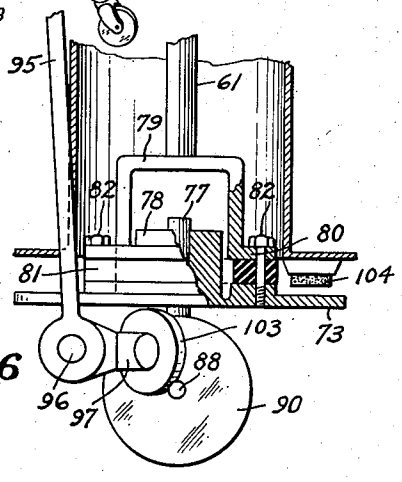


Fig. 6



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Fig. 3

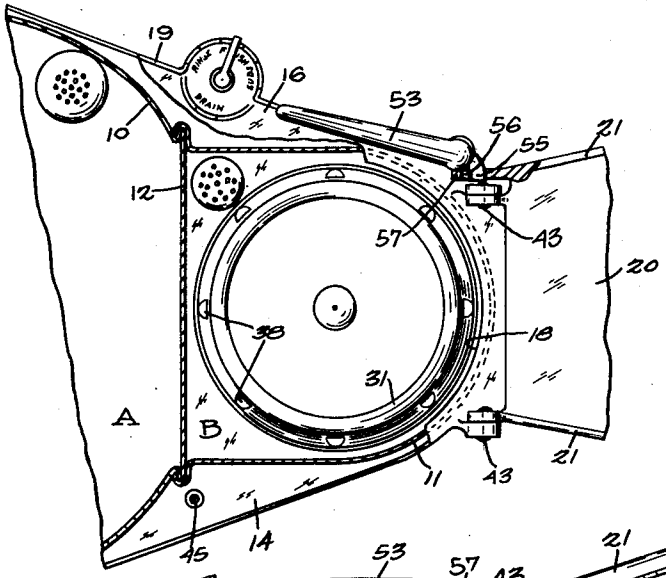


Fig. 4

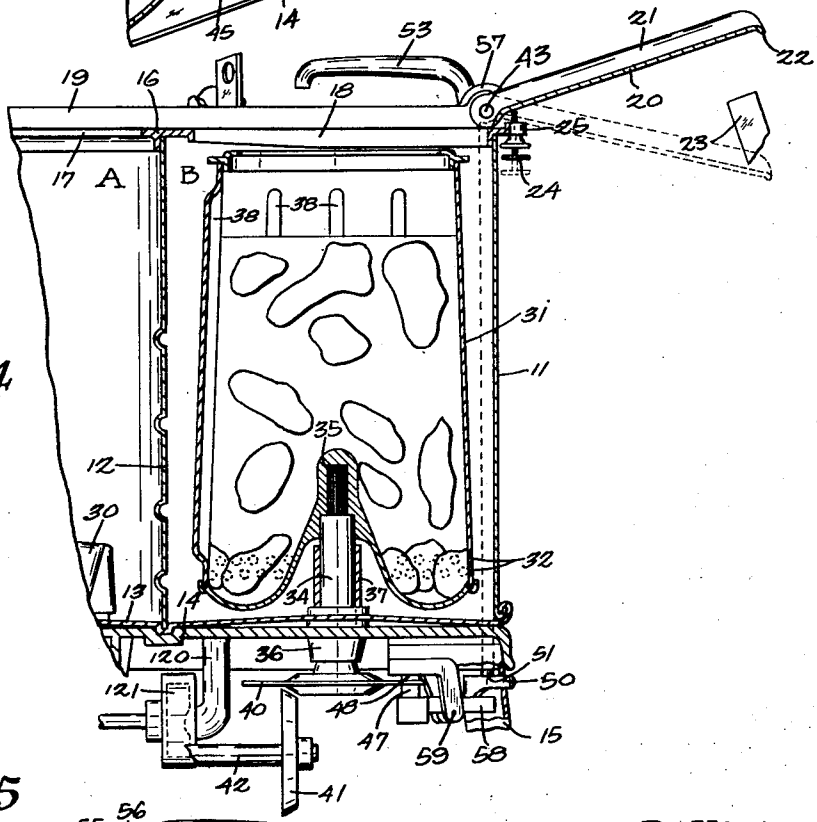
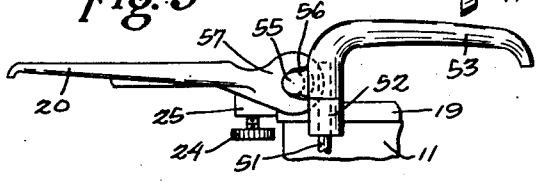


Fig. 5



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UNITED STATES PATENT OFFICE

1,969,178

LAUNDRY MACHINE

James B. Kirby, West Richfield, Ohio, assignor, by mesne assignments, to The Apex Electrical Manufacturing Company, Cleveland, Ohio, a corporation of Ohio, as trustee

Application December 6, 1927, Serial No. 238,036

32 Claims. (Cl. 210—71)

This invention relates to laundry machines and particularly to the centrifugal appliances whereby washing liquid is removed from clothing and fabrics. The objects of the invention are the provision of new and improved means for supporting, driving, braking and controlling such a centrifuge; the provision of new and simplified safety devices for preventing bodily injury therefrom; the provision of an improved cover for domestic laundry extractors; the provision of facilities for rinsing the clothing while spinning; while further objects and advantages of the invention will become apparent as the description proceeds. This application is a continuation in part of my prior applications Serial No. 114,191, filed June 7, 1926; Serial No. 188,332, filed May 2, 1927; and Serial No. 195,091, filed May 28, 1927, and certain features illustrated herein are reserved as the subject matter of my application Serial No. 174,208, filed March 10, 1927; Serial No. 191,483, filed May 14, 1927; Serial No. 238,035, filed December 6, 1927; and Serial No. 257,283, filed February 27, 1928.

In the drawings accompanying and forming a part of my application I have shown certain illustrative embodiments of my invention. Fig. 1 is a perspective view of a combined washing machine and extractor containing my improvements; Fig. 2 is a vertical, longitudinal, sectional view through the extractor and a part of the washer illustrating the safety cover closed and the parts in driving position as in Fig. 1; Fig. 3 is a top plan view of the parts in Fig. 2 showing the cover open; Fig. 4 is a view similar to Fig. 2 showing the position of the driving mechanism when said cover is open; and Fig. 5 is a detail view of the far side of the cover when open as shown in Fig 4. Fig. 6 is a modified form of stop and brake mechanism.

The embodiment of my invention illustrated in Figs. 1 to 5 inclusive comprises a washing compartment A and an extracting compartment B formed in a single casing structure which preferably comprises upright side walls 10 and 11 formed more or less completely as surfaces of revolution about vertical axes, said surfaces intersecting at two sides of the machine and the lines of intersection being connected by a common partition wall 12, which is tightly secured to the outer walls, and also to the metal plate 13 which constitutes the bottom of the casing and is suitably seamed to the side walls and partition. This casing is seated on and carried by a horizontal base-plate 14 which in turn is carried by suitable legs 15, while the top of the casing is stiffened and finished by a suitable top plate 16 formed with two apertures, 17 and 18, communicating with the compartments A and B, respectively, and preferably surrounded by an upstanding rim or lip 19 which embraces both apertures. When, as here shown, the compartment B is smaller than the compartment A, the plates 14 and 16 are also tapered to conform approximately thereto; and hinged to the top plate on a horizontal axis at the side furthest from the washing compartment is a cover 20 having its two sides flared from the hinge axis so as to fit inside the lip 19 when the cover is in closed position as shown in Figs. 1 and 2. The side of the cover which is down when said cover is closed is also preferably formed with marginal flanges 21—21 which serve, when the cover is open as shown in Figs. 3 and 4, to define a kind of drain chute to enable wet clothes to be transferred from the machine to another receptacle without wetting the floor. The free end of the cover is formed with a lip 22 rolled away from the flanges 21 so as to enable it to overlap the rim of a sink or set tub 23 as shown in Fig. 4. To limit the movement of this cover I preferably provide a set screw 24 carried by an ear 25 formed on the top plate, which keeps the shelf from clattering against the rim 23, and also enables said cover to be used as a shelf. Said cover can be slanted either up or down to drain in either direction.

Located in the compartment A is clothes agitating mechanism of any suitable type, here typified by a portion of an agitator shown at 30 in Figs. 2 and 4; and located in the compartment B is a centrifuge container of any suitable or desired kind or construction, here typified by the upstanding elongated hollow member 31 shown in Figs. 2 and 4. The detail construction of this device is not important. Such containers are generally formed with their sides more or less perforated as shown at 32 and open at their upper ends, being concentric to a vertical axis which coincides with the supporting and rotating shaft 34 to which the container is preferably attached in a removable manner as by an internally-fluted socket 35, slidably engaging the complementary end of the shaft.

I have shown the bottom plate 14 as formed with an internally threaded boss 36 in which is screwed the bearing sleeve 37 in which the shaft 34 is carried. In the present embodiment I have shown this extractor as narrowed towards the top to increase the stability of the same and compel the clothing to be introduced nearer the cen-

ter. I have also found it desirable for many reasons to confine the discharge apertures 32 to a narrow region adjacent to the bottom of the container, which thus becomes the portion of largest diameter, leaving the remainder of the side wall imperforate which both reduces the chances of cutting or injuring fabrics or fingers, and decreases the tendency of soap suds to collect between the container and compartment wall which would otherwise tend to slow down the container or completely to prevent its rotation. Another advantage of this construction is that ordinarily, while the container is at rest and more or less filled with clothes, a bucket of water poured therein for rinsing purposes will run out so slowly that a thorough rinsing can be affected within the container, while all that water is immediately ejected when rotation is commenced. In order to prevent the escape of water being impeded by the packing of the clothing against the sides I prefer to form the side walls with a plurality of downwardly pressed corrugations 38 defining inwardly opening grooves leading preferably from top to bottom of the container and each having a discharge opening at the point furthest removed from the axis. Inasmuch as the escape of the water during the rotation is assisted both by gravity and by centrifugal force, little slant is necessary to the side walls and few openings are needed.

The tapered side wall and the flared bottom of the extractor container operate during the rotation of the extractor to force the articles in the topmost and bottommost portions of the extractor towards each other and while this takes place the upstanding central hub of the extractor cooperates in effecting the even distribution of the articles being extracted, this result being made possible by reason of the relatively small distance between the hub and the side wall of the extractor container. By constructing an extractor basket in the form of a relatively narrow elongated container wherein the length of the extractor is considerably greater than its diameter and by providing a single support for the extractor container at a point intermediate its height the natural resiliency of the materials used in forming the container permit the unsecured top portion thereof to gyrate a slight amount, thereby greatly reducing the vibration of the machine as a whole by preventing the transmission of vibrations from the rotating container to its supporting frame as the forces occasioned by the unbalanced load of the extractor are expended in effecting the gyration of the extractor container. The use of a frusto-conical extractor in connection with a cylindrical casing will allow for the gyration of the top of the extractor container without increasing the diameter of the cylindrical casing necessary for the accommodation of the widest part of the container which is located at the point of the least radial movement.

Carried by the lower end of the shaft 34 is a horizontal friction plate 40 adapted to cooperate with a friction wheel 41 carried by the horizontal drive shaft 42 which in turn is driven by some suitable power source such as an electric motor (not shown). By suitable means such as the clutch 43 operated by a clutch lever 44 connected to an upright rock-shaft 45 provided with a handle 46, the power of the shaft can be connected to or disconnected from the washing devices 30 through the mediation of suitable gearing (not shown).

The operation of the extractor is here controlled by means of a horizontal lever 58 pivoted below the casing on a substantially horizontal axis 59 and having at its inner end a friction shoe 47 adapted to engage in supporting relation some portion of the plate 40. Carried by the frame above this plate is a fixed friction block 48. The outer end of the lever 45 is engaged by an end-cam 50 carried by the lower end of a vertical shaft 51 journaled in ears 52 projecting from the plates 14, 16, respectively. Tightly secured to the upper end of the shaft 51 is the hand lever 53 adapted, when moved in a direction to release the lever 45, to project over the top of the cover 20 as illustrated in Fig. 1, thereby preventing the raising of the cover and at the same time lowering the extractor and its driving disk into engagement with the friction wheel 41 as shown in Fig. 2. Whenever the handle 53 is moved aside to permit opening of the cover, the action of the cam 50 upon the lever 45 not only lifts the shoe 47 into contact with the friction plate, but also lifts said friction plate out of contact with its driving wheel and brings the plate into contact with the brake shoe 48 so that the container is quickly brought to rest, undue severity of action being prevented by interposing a spring back 54 behind one of the brake-shoes. To enable the raising and lowering of the plate it is necessary to afford a slight endwise freedom of motion to the shaft 34. In order to prevent the swinging of the lever 53 into operating position when the cover 20 is raised I have shown said lever as provided with a finger 55 which, when the lever is moved to extractor-arresting position, projects into an aperture 56 formed in a flange 57 of the cover eccentrically of the hinge axis 43. Opening of the cover is impossible until the finger 55 has been swung into said aperture, after which such opening of the cover causes the edge of said aperture to engage that finger so as to prevent movement of the lever until the cover is again closed; see Figs. 3 and 5.

In the modification shown in Fig. 6, the container (not shown) is carried by a vertical shaft 61 supported by a horizontal circular friction plate 73 carried by the vertical shaft 77 which is secured to the hub 78 with which this plate is formed. The lower end of the shaft 61 terminates in a spider 79 whose arms merge in a ring 80 which is secured to this friction plate through the medium of an annular cushioning member 81 of soft rubber, (or material having the herein essential properties of soft rubber) aided by loosely fitting bolts 82.

Carried by a horizontal drive shaft 88 beneath the plate 73 is a friction disk 90 and pivoted on a horizontal axis 96 near this plate is a hand lever 95 provided with a radial arm 97 provided with an anti-friction roller 103 pivoted thereto upon an axis which is radial to the shaft 77. When the lever 95 is moved in one direction the plate 73 is lowered either with or along the shaft 77 until it rests on the friction disk 90 in driven and supported relation; when the lever 95 is moved in the opposite direction the plate is elevated out of contact with this disk, and if the arm be moved a sufficient distance is forced into contact with a fixed brake-shoe 104 carried by the casing or machine frame above said plate.

It is desirable to provide means for permitting introduction of rinse water into the centrifuge basket or container during the extracting operation in order to complete the rinsing of the clothes. This is preferably effected by leaving a recess be-

tween one margin of said cover and the adjacent portion of the casing top as shown for example at 105 in Figs. 1 and 2, thus enabling the insertion of a liquid pipe 106. The formation of this cover with flanges 21 at its sides facilitates this by causing the web portion of this cover to be elevated above the surface of the top plate 16. The tapering shape of the container coupled with the smaller area of the outlet openings heretofore described restrains the discharging of the liquid sufficiently to enable a thorough rinsing action to be obtained.

When, to save space and metal, the casing is close to the bottom of the container, it is necessary for successful rinsing that means be provided to remove the spent liquid immediately, for which purpose the bottom of the casing is provided with an outlet 120 leading to a discharge pump 121, which is suitably connected to the motor 122 which drives the mechanism and has its outlet connected to a hose 123 or other waste pipe.

It will be understood that I do not limit myself to the particular structure of casing here shown, or to any one shape of container, nor to any one shape and mounting of cover, nor in any other respect except as specifically recited in the claims hereto annexed which I desire may be construed broadly, each independent of limitations contained in other claims.

Having thus described my invention what I claim is:

1. In a laundry machine, a casing having an extractor compartment therein, said compartment having an opening in its top, an extractor in said compartment having an upwardly presented mouth, a shaft journaled beneath said compartment and connected to said extractor, and a safety cover hinged to said casing at one side of said opening, there being a recess between one margin of said cover and the adjacent portion of the casing-top when the cover is closed, said recess being of a size to admit a movable pipe to discharge into said mouth.

2. In a laundry machine, a casing having an extractor compartment therein, said compartment having an opening in its top, an extractor in said compartment, a cover for said compartment hinged to said casing on a horizontal axis at one side of said compartment and constituting a drain board when swung away from said compartment, said cover being of a size to overlap part of the casing top adjacent to said opening and having spaced flanges along those of its margins which are radial to the hinge axis, said flanges facing downwardly when said cover is closed and facing upwardly when said cover is opened, there being a space between the ends of said flanges for the discharge of liquid in either direction depending upon the inclination of the cover when opened.

3. In a laundry machine, in combination, a casing having a compartment therein, an extractor in said compartment, mechanism for rotating said extractor, a safety cover for said compartment hinged to said casing at one side of said compartment, a control rod for said mechanism movably carried by said casing in vertical position at one side of said compartment, connections between said rod and said mechanism whereby movement of said rod to one position connects said mechanism to said extractor in operating relation and movement of said rod to another position disconnects said mechanism from said extractor, means associated with the upper end of said rod whereby said rod is secured against movement into extractor-operating position except when said cover is closed and whereby it may be moved into extractor-arresting position when said cover is closed, and means for holding said cover closed when said rod occupies its extractor-operating position and for allowing said cover to be opened widely when said rod occupies its other named position.

4. In a laundry machine, in combination, a casing having a compartment therein, an extractor in said compartment, mechanism for rotating said extractor, a control lever for said mechanism, a combined drain-chute and safety-cover for said compartment hinged to said casing at one side of said compartment, and adapted when in one position to cover said compartment and in another position to project away therefrom, said lever swinging past a part of said cover when said cover is closed and when the rotating mechanism is rendered operative, in which position said lever prevents the cover from being opened, said cover having a part swinging past said lever when the cover is opened, and means automatically arresting the motion of said extractor when said lever is moved to a position such as to allow the cover to be opened.

5. In a laundry machine, in combination, a casing having a compartment therein, an extractor in said compartment, mechanism for rotating said extractor, mechanism for arresting the rotation of said extractor, a control lever pivoted to said casing having an operating handle located adjacent to the top of said casing, connections between said lever and said mechanism whereby said rotating mechanism is operatively connected to said extractor when said lever stands at one position of its movement and whereby said arresting mechanism is connected to said extractor when said lever stands in a second position of its movement, a safety cover for said compartment, and interlocking connections between said cover and the upper end of said lever to prevent said lever from being moved to extractor rotating position except when said cover is closed.

6. In a laundry machine, a casing having an extractor compartment, an extractor in said compartment, mechanism for rotating said extractor, a top plate secured to said casing and having an opening communicating with said compartment, and a marginal up-standing flange and a ledge portion inside said flange, a multilateral cover for said compartment having one of its margins hinged to said casing upon a horizontal axis at one side of said aperture, the two margins of said cover which are adjacent to said hinge having flanges which are concealed when the cover is closed and exposed when the cover is open, said cover when open forming a drainboard for use in transferring articles to and from said extractor.

7. In a laundry machine, a casing having an extractor compartment, an extractor in said compartment, mechanism for rotating said extractor, a cover for said compartment hinged to said casing, a lever for controlling the rotation of said extractor by said mechanism, said lever and cover being so located that each swings past a part of the other, and so that only one can be moved at a time, said lever being movable from stop position only when said cover is closed, and said cover being movable from closed position only when said lever occupies its stop position.

8. In a centrifuge, an upright rotatable container, a casing around said container and hav-

ing an apertured top, a cover hinged to said container along a horizontal axis near one side of said aperture and having a flange adjacent to one edge of said casing, a controlling lever pivoted to that side of the casing to which said cover is hinged, said lever having a portion which projects into obstructing relation with a part of the cover when the lever is in container-operating position to prevent opening of the cover, driving mechanism for said container and connections between said lever and driving mechanism for starting and stopping said container, said flange having a portion which projects into obstructing relation with said lever when the cover is opened to prevent movement of said lever to operating position.

9. In a laundry machine, a casing having an extractor compartment therein, an extractor-container inside said compartment, a safety-cover hinged to said casing at one side of said compartment, a control handle pivoted for movement past one side of said compartment, a drive shaft, a brake, means operative when said handle occupies one limit of its movement for connecting said shaft to said container in driving relation, and means operative when said handle occupies the other limit of its movement for disconnecting said shaft from said container and applying said brake in container-arresting relation, said handle and cover having interrelated parts adapted to hold said cover closed when said handle is in the first named position, and to hold said handle in the second named position when said cover is open.

10. In a laundry machine, in combination, a casing having a compartment therein, said compartment having an opening in its top, an extractor in said compartment, constantly rotating mechanism for rotating said extractor, mechanism for arresting the rotation of said extractor, a safety cover for said compartment hinged to said casing on a horizontal axis at one side of said opening, a control lever pivoted to said casing on a vertical axis at one side of said opening, connections between said lever and said mechanism whereby said rotating mechanism is operatively connected to said extractor when said lever stands at one position of its movement and whereby said arresting mechanism is connected to said extractor when said lever stands in a second position of its movement, and interlocking devices whereby said lever is blocked from being moved to extractor rotating position except when said cover is closed and also blocked from being moved from extractor arresting position when said cover is open.

11. In a laundry machine, a casing having an extractor compartment therein, an extractor-container inside said compartment, a safety-cover hinged to said casing at one side of said compartment, a control handle movably mounted relative to said compartment, said handle and cover having parts adapted to be moved one past the other whereby said cover is held shut by said handle except when the handle occupies one extreme position of its range of movement and said handle is held immovable from said extreme position when said cover is otherwise than closed, and means controlled by said handle for holding said container stationary when said handle is in the extreme position named and for causing rotation thereof when said handle is moved from that position.

12. In a centrifuge, an upright rotatable container, a casing around said container, a cover hinged to said casing, driving and braking means for said container, a controlling lever for said driving and braking means pivoted to said casing and adapted to swing past a part of said cover, operative connections between said lever and said driving and braking means adapted when said lever stands in one position to render said braking means operative and said driving means inoperative, and also adapted when said lever stands in a second position to render said driving means operative and said braking means inoperative, said lever and cover each having a portion swinging past the other so that said cover can be opened only when said lever stands in braking position and said lever can be moved from braking position only when said cover is closed.

13. In a centrifuge, in combination, an upright rotatable container, a brake element rotatable therewith, a cover for said container, a second brake element and a handle for said last element, said handle and cover swinging in intersecting arcs as to prevent the opening of said cover except when the handle is in braking position.

14. In a laundry machine, a casing having an extractor compartment therein, said compartment having an opening in its top, an extractor in said compartment, mechanism for rotating said extractor, a cover for said compartment hinged to said casing on a horizontal axis at one side of said opening, a lever for controlling the rotation of said extractor by said mechanism, said lever being pivoted to said casing on a vertical axis at one side of said opening, and said lever and cover being so located that the arc of movement of the one intersects the arc of movement of the other so that only one can be moved at a time, said lever in one of its limiting positions being located wholly outside the arc of movement of said cover to permit said cover to be opened widely without interference by said lever.

15. In a centrifuge, an upright rotatable container, a casing around said container and having an apertured top, a cover hinged to said container along a horizontal axis near one side of said aperture, a controlling lever pivoted to said casing on a vertical axis at one side of said cover, said lever having a portion which projects into obstructing relation with a part of the cover when the lever is in container-operating position and being out of cover obstructing position when said lever occupies its container-at-rest position, constantly rotating driving mechanism for said container, and connections between said lever and driving mechanism for starting and stopping said container, and means engaging said lever when said cover is open to prevent movement of said lever to operating position.

16. In a laundry machine, a casing having an extractor compartment therein, an extractor-container inside said compartment, a drive-shaft, a brake, a safety-cover hinged to said casing at one side of said compartment, means for controlling the connection of said container to said shaft and brake, said means comprising an upright movable rod carried by said casing at one side of said compartment, means operative when said rod occupies one limit of its movement for connecting said shaft to said container in driving relation, and means operative when said rod occupies the other limit of its movement for disconnecting said shaft from said container and applying said brake in container-arresting relation, said controlling means also comprising mechanism whereby said rod is held in its brake-

applying position except when said cover is closed.

17. In a centrifuge, a frame, a vertical shaft rotatably journaled therein, a container carried and driven by said shaft, a friction element rotatable with said shaft arranged to be raised and lowered, a friction driving element located beneath said first element and adapted to engage the same in driving relation when said first element is lowered, a brake element carried by said frame above said first element adapted to be engaged thereby when the same is elevated, and lever means for raising and lowering said first element.

18. In a centrifuge, a casing having an extractor compartment therein, said compartment having an opening in its top, an upright rotatable container in said compartment, a cover hinged to said casing, driving and braking means for said container, a controlling lever for said driving and braking means pivoted to said casing on a vertical axis, operative connections between said lever and said driving and braking means adapted when said lever stands in one position to connect said container to said driving means in operated relation and also to disconnect said container from said braking means, and also adapted when said lever stands in a second position to disconnect said container from said driving means and connect it to said braking means, said lever and cover having portions which swing in intersecting arcs so arranged that said cover can be opened only when said lever stands in said second position, and means whereby movement of said lever from said second position is prevented except when said cover is closed, said lever when in its second named position being located wholly at one side of the arc of movement defined by said cover.

19. In a laundry machine, a casing having a compartment therein, an extractor in said compartment, a cover for said compartment hinged to said casing on a horizontal axis at one side of said compartment, a vertical rock-shaft at one side of said compartment, an operating handle for said rock-shaft, driving means for said extractor, connections between said rock-shaft and said driving means whereby movement of said handle into one position connects said driving means to said extractor in operating relation, means whereby said cover is held in closed position when said handle occupies the position last described, and means whereby movement of said handle to such position is prevented except when said cover is closed, said handle being wholly outside of the arc of movement of said cover when moved to such position that said driving mechanism is disconnected from said extractor.

20. In a laundry machine, a casing having a compartment therein, an extractor in said compartment, a cover for said compartment hinged to said casing at one side of said compartment, driving mechanism for said extractor located beneath said casing, a control handle pivoted to said casing upon a vertical axis at one side of said compartment, connections between said handle and said driving means whereby movement of said lever to one position connects said driving means to said extractor in operating relation, and movement of said lever to another position disconnects said driving means from said extractor, and means whereby said lever is locked in its last-mentioned position whenever the cover is displaced from its fully closed position, said lever having a part which swings across a part of said cover whenever said lever is moved to its first named position.

21. In a laundry machine, a casing having a compartment therein, an extractor in said compartment, a cover for said compartment hinged to said casing at one side of said compartment, driving means for said extractor located beneath said casing, a vertical control-rod movably carried by said casing at one side of said compartment, connections between said rod and said driving means whereby movement of said rod to one position connects said driving means to said extractor in operating relation and movement of said rod to another position disconnects said driving means from said extractor, and interlocking connections between said rod and cover whereby the movement of said rod into extractor-operating position is permitted only when said cover is closed and whereby said cover is freed to be opened widely when said rod occupies its other named position.

22. In a centrifuge, a casing, a container therein, a vertical shaft to which said container is attached, a friction-driven element rotatable with said shaft, a friction-driving element and a friction-braking element located in operative relation to said friction-driven element, a vertical control rod at one side of and parallel to said shaft, a safety cover hinged to said casing and adapted either to conceal or to expose said container according to the position to which it is moved, and connections between said rod and cover and between said rod and friction-driven element whereby said friction-driven element is held in contact with said friction-braking element during any position of said cover which exposes said container and whereby movement of said cover to container-exposing position is prevented during the engagement of said friction-driven element with said friction-driving element.

23. In a centrifuge, a container, a vertical shaft therefor, a driving element rotatable with said shaft and having a driving portion and a braking portion, a rotatable element adjacent to said driving element and having a part adapted to engage the driving portion thereof in operating relation, a braking element located adjacent to said first element and having a friction part adapted to engage the braking portion of said element in braking relation, a control rod, means operative by the movement of said rod for producing relative vertical movement between said first element and said last two elements whereby said first element is caused to engage the last two elements selectively and prevented from engaging said last two elements simultaneously, a safety cover adapted to be moved either to permit or prevent access to said container, and connections between said rod and cover whereby the engagement of said rotatable element with said first element is prevented during any position of said cover which permits access to said container.

24. In a laundry machine, a casing having an extractor compartment therein, said compartment having an opening in its top, an extractor in said compartment having an upwardly presented mouth, a shaft journaled beneath said compartment and connected to said extractor, a combined drain-chute and safety cover hinged to said casing at one side of said opening, driving and braking mechanism for said shaft, controlling devices for said driving and braking mechanism and for said cover whereby the cover is retained in closed position while the driving mechanism is connected to said shaft, said cover

when closed disclosing at one margin a recess sufficient for the introduction of a water pipe, and a pipe projecting into said recess in a position to discharge into said extractor.

25. In a laundry machine, a casing having a compartment therein, an extractor in said compartment, a driving element beneath said compartment, and a safety-cover for the top of said compartment, said cover adapted and arranged when open to constitute a drain-chute and when closed to prevent the introduction of the operator's arm, the edge of said cover being spaced from the edge of said compartment to define a narrow opening, interlocking connections between said cover and said driving mechanism whereby operation of the extractor is prevented except when the cover is closed, and a spin-rinse nozzle adapted to extend into said opening when said cover is closed.

26. In combination, a casing having a compartment therein, an upright rotatable container in said compartment, a brake element rotatable with said container, a combined clothes chute and cover for said container pivoted to said casing upon a horizontal axis at one side of said compartment and movable about its axis from a horizontal position covering said container to a reverse horizontal position alongside of said container, a constantly rotating driving element and a braking element, a handle, connections operable by said handle for connecting said container to said driving element or braking element selectively, and means preventing operation of said handle except when said cover is closed, said means also being arranged to prevent opening of said cover until said handle has been moved to that position corresponding to disconnection of said driving element from said container.

27. In an extractor mechanism, a casing having a compartment therein, an extractor in said compartment, driving mechanism below said compartment, a safety cover hinged to said casing at one side of said compartment on a horizontal axis, an upright control-rod located at one side of said compartment, an operating member for said rod located at the upper end thereof at a point adjacent to said safety cover, means operative upon movement of said rod to one position to connect said driving mechanism to said extractor and upon moving said rod to a second position to disconnect said driving mechanism from said extractor, and means associated with the upper end of said rod located near the hinge axis and operable by the turning movement of the cover for locking said rod against movement at a determined position of said cover.

28. In a centrifuge, a frame, a casing carried thereby, a vertical shaft journaled therein, a friction element rotatable with said shaft, a container driven by said shaft, a safety cover for said container hinged to said casing, a driving shaft journaled in said frame, a cooperating friction element located adjacent said first friction element and driven by said driving shaft, said cooperating friction element being adapted to engage and drive said first friction element, and a vertically movable member operatively interconnected with said cover whereby said first friction element is held axially away from said cooperating friction element whenever said cover is displaced out of container-protecting position.

29. In a centrifuge, a frame, a casing carried thereby, a vertical shaft journaled therein, a friction element rotatable with said shaft, a container driven by said shaft, a safety cover for said container hinged to said casing, a driving shaft journaled in said frame, a second friction element located adjacent to said first friction element and driven by said driving shaft, said second friction element being adapted to engage and drive said first friction element, a member located adjacent to said first friction element and movable axially relative to said first friction element, means for moving said member so as to engage said first friction element and displace it out of contact with said second friction element, a brake member adapted to engage said first friction element upon a continued movement of said member, and interconnecting means between said cover and member whereby the position of said member is determined by the position of said cover.

30. In a centrifuge, a frame, a casing carried thereby, a vertical shaft journaled therein, a friction element rotatable with said shaft, a container driven by said shaft, a safety cover for said container hinged to said casing, a driving shaft journaled in a bearing carried by said frame, a second friction element located adjacent to said first friction element and driven by said driving shaft, a brake member adjacent to said first friction element, and means controlled by the position of said cover for affecting relative movement between said first friction element and said brake element whereby said first friction element is selectively driven by said second friction element or retarded by said brake member.

31. In a centrifuge, a frame, a vertical shaft journaled therein, a container operatively connected to said shaft, a power-transmitting element rotatable with said shaft and having two friction engaging portions, each defining a surface of revolution about said shaft, a driving-shaft journaled in a bearing carried by said frame, a cooperating power-transmitting element located adjacent to said first power-transmitting element and operatively connected to said driving-shaft, said second power-transmitting element having a friction engaging portion engageable with one of the friction engaging portions of said first element, a friction braking-element located in proximity to the second friction engaging portion of said first named element, and means operable from the exterior of said centrifuge for moving said braking-element into contact with the corresponding friction engaging surface of said first-named element and thereby displacing said first-named element out of engagement with said cooperating power-transmitting element.

32. In a centrifugal extractor, a vertical shaft, an upright container operatively connected thereto, a safety cover for said container, an element having constant driving connection with said shaft, said element having two friction surfaces each defining a surface of revolution coaxial therewith, a driving shaft, a second element operatively connected to said driving shaft and having a friction surface formed to cooperate with one of the friction surfaces of said first element, a third element having a friction surface formed to cooperate with the other friction surface of said first element, and means controlled by the position of said cover for moving one of said elements axially of said first element whereby said pairs of friction surfaces are engaged selectively.

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1,969,178.—*James B. Kirby*, West Richfield, Ohio. LAUNDRY MACHINE. Patent dated August 7, 1934. Disclaimer filed February 4, 1939, by the trustee, *The Apex Electrical Manufacturing Company*, and the assignee, *Industrial Improvements Incorporated.*

Hereby disclaim claims 3, 30, and 32 of said patent.

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