

Sept. 19, 1939.

A. Y. DODGE

2,173,603

CLEANING MACHINE

Filed March 6, 1937

3 Sheets-Sheet 1

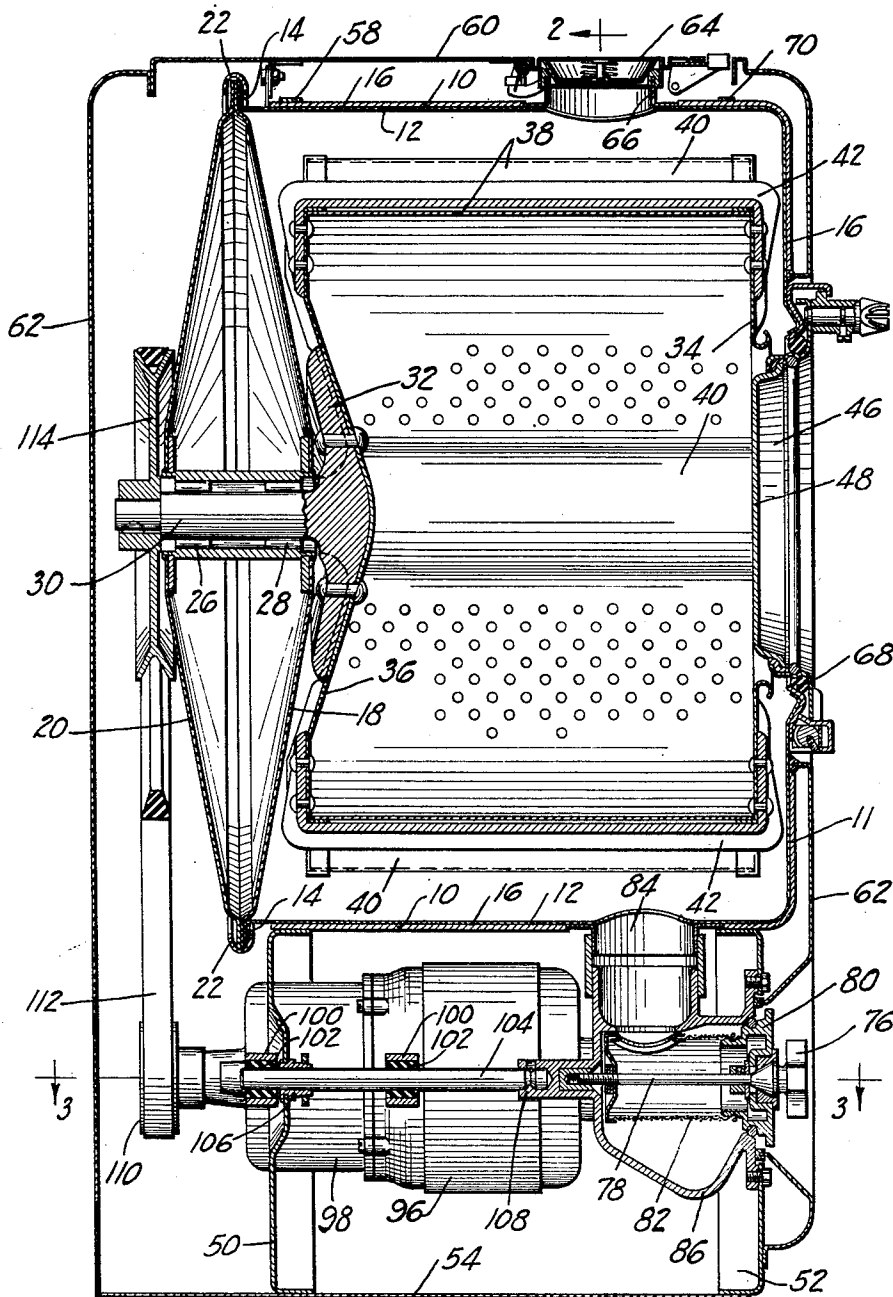


Fig. 1

2

INVENTOR.
ADIEL Y. DODGE

BY

McConkey & Booth
ATTORNEYS.

Sept. 19, 1939.

A. Y. DODGE

2,173,603

CLEANING MACHINE

Filed March 6, 1937

3 Sheets-Sheet 2

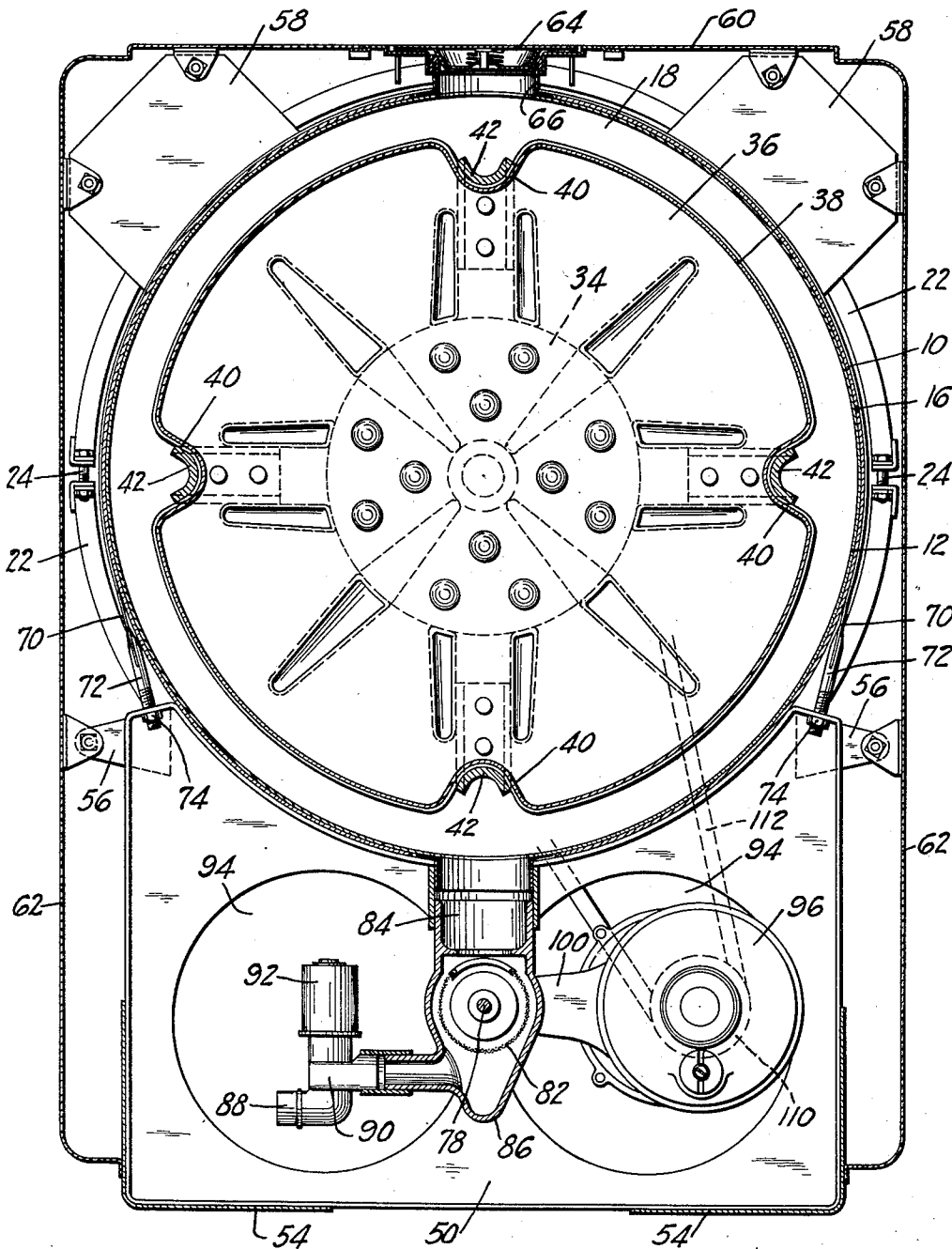


FIG. 2

INVENTOR.
ADIEL Y. DODGE
BY
Mc Couhey & Booth
ATTORNEYS.

Sept. 19, 1939.

A. Y. DODGE

2,173,603

CLEANING MACHINE

Filed March 6, 1937

3 Sheets-Sheet 3

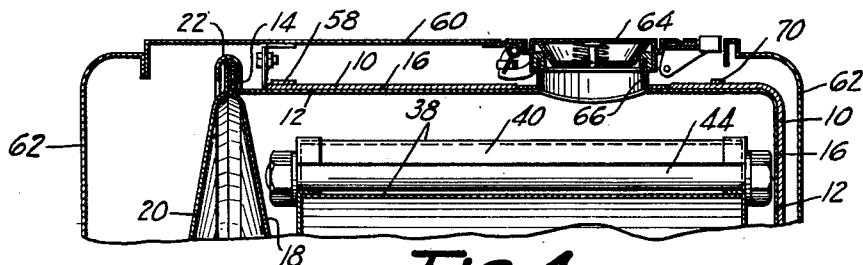


FIG. 4

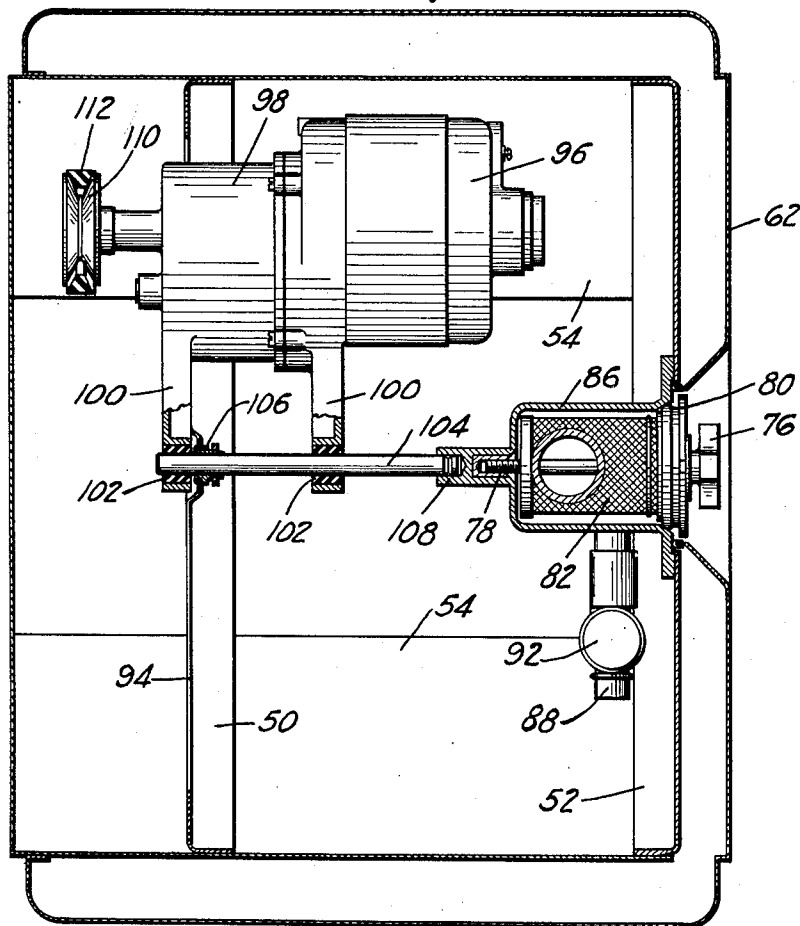


FIG. 3

INVENTOR.
ADIEL Y. DODGE
BY
Mc Conkey + Booth
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,173,603

CLEANING MACHINE

Adiel Y. Dodge, South Bend, Ind., assignor to
Bendix Home Appliance, Inc., Detroit, Mich., a
corporation of Delaware

Application March 6, 1937, Serial No. 129,412

13 Claims. (Cl. 68—139)

This invention relates to washing and dry-cleaning machines and the like, and is illustrated as embodied in an automatic cyclic washing machine.

5 An object of the invention is to strengthen such machines and make them more rigid while at the same time making them lighter in weight and less expensive to manufacture. Having this object in view, an important feature relates to
10 doing away with the machine frame by utilizing the tub member of the machine as the principal structural element of the machine. The tub being a relatively strong cylindrical member, a very rigid structure of few parts is secured by
15 relating the other elements of the machine directly to it.

In one desirable arrangement, the tub is secured (by encircling straps or the like) in saddles forming part of the machine base. If desired,
20 the saddles and the tub may rigidly carry brackets to which are secured top and side panels which form an outer light-weight casing which carries no load but which enhances the appearance of the machine.

To secure the utmost strength, with very light weight, in the tub member I prefer to build it up from a drawn stamping having its end wall formed with an opening for the introduction of
30 clothes or other material to be cleaned, and having secured across its open end face to face with each other two conical stampings carrying bearings for the shaft of a rotor or drum within the tub member.

Various other features of novelty relate to the structure of the rotor or drum, to the mounting
35 of a drive unit in the base of the machine to tighten a belt drivably connecting it to the rotor, and to the mounting of a door for the opening in the tub member to have its central portion in the plane of the end wall of the rotor to hold the clothes in place. These and other objects and
40 features, including various novel constructions and desirable arrangements of parts, will be apparent from the following description of the illustrative embodiment shown in the accompanying drawings, in which:

Figure 1 is a central vertical section through the machine;

50 Figure 2 is a vertical section there-through on the line 2—2 of Figure 1;

Figure 3 is a horizontal section through the base of the machine, on the line 3—3 of Figure 1; and

55 Figure 4 is a partial section showing an alternative construction of rotor or drum.

The machine selected for illustration is of the type described and claimed in application No. 6,425, filed concurrently herewith by Rex Earl Bassett and John W. Chamberlin, and operates
6 automatically according to the cycle described in that application. The present invention relates to an alternative structural design which is believed to retain the advantages of the Bassett and Chamberlin invention while reducing the weight and manufacturing cost of the machine. 10

According to an important feature of my invention, the principal structural element of the machine is a novel horizontal cylindrical tub member built up from a drawn cup-shaped
15 stamping 10 having a vertical end wall 11 and a solid cylindrical side wall 12 preferably integral with an outwardly-turned flange 14. The end and side walls are preferably substantially covered by a layer 16 of heat-insulating material. Across the open end of this stamping are secured,
20 face to face, two generally conical stampings or disks 18 and 20, the peripheries of which engage each other and preferably are secured directly to the flange 14 (with a sealing gasket if desired) by means such as channel-section straps 22
25 drawn tight by clamp bolts 24.

The disks 18 and 20 carry at their axis suitable bearings 26 and 28, spaced a substantial distance axially, in which is journaled a shaft 30 having
30 a head or spider 32 secured to a rotor or drum within the tub member 10. The drum illustrated in Figures 1 and 2 includes annular end walls or stampings 34 and 36 peripherally secured to a generally cylindrical perforated side wall 38 formed with inwardly projecting transverse ribs
35 40.

The drum may be reinforced by tie members such as the straps 42 riveted to the end plates 34 and 36 as in Figures 1 and 2, or such as tie rods 44 as in Figure 4, the tie members in either case
40 passing through the ribs 40.

The end walls 11 and 34 are formed with aligned circular openings coaxial with respect to the shaft 30. The wall 11 of the tub member has mounted thereon a suitable pivoted door 46
45 carrying a central glass 48 permitting the operator to watch the operations within the drum 34—38.

The central portion of the glass 48 is offset into the plane of the end wall 34 of the drum,
50 and substantially closes the opening in that wall (except for a narrow annular space through which wash and rinse water is injected into the drum through a suitable nozzle) and thus serves to hold the clothes in place inside the drum. The 55

glass 48 does not, however, actually engage the wall 34 at any point, and does not interfere with the rotation of the drum.

The tub element 10—24 is seated in transverse stamped metal saddles 50 and 52, welded or otherwise secured to two L-section base panels 54 extending at right angles to the saddles, to form the base of the machine. The saddles 50 and 52 may rigidly carry suitable laterally-extending brackets 56, preferably welded permanently thereto, and the tub side wall 12 may similarly carry upwardly and outwardly projecting brackets 58, to which are detachably bolted or otherwise secured relatively light metal stampings forming top and side panels 60 and 62, which in effect comprise an inclosing casing which enhances the appearance of the machine. If desired, one or more of the side panels 62 may be integral with the top panel 60.

The top panel 60 is shown provided with a suitable door 64, which can be opened to feed soap through a collar 66 into the tub 10—24. The front one of the panels 62 is shown formed with an opening for the door 46, the edge of the opening being flanged inwardly and provided with a rubber sealing member 68 engaging the wall 10.

The tub element 10—24 is shown securely fastened to the saddles 50 and 52 by encircling straps 70 the ends of which are provided with threaded sections 72 passing through the flanges of saddles 50 and 52 and having threaded thereon clamp nuts 74 engaging the flanges. It will be noted that the saddles 50 and 52 are flanged entirely around their edges, to strengthen them and to form broad surfaces engaging the tub side wall 12 and the base panels 54.

Below the door 46 the front panel 62 has a second opening for the handle 76 of a clamp bolt 78 holding a detachable cover 80 for a cylindrical strainer element 82 arranged below and in communication with a telescoping outlet tube 84 one part of which is a spout welded to the side tub wall 12 over an outlet opening therein, and the other part of which is integral with a drain casting 86 into which the liquid passes through the screen or strainer 82.

The casting 86 communicates with a suitable drain pipe 88 through a valve 90 controlled by a solenoid or the like 92. The inlet valves (not shown) for the hot and cold water are also controlled by solenoids, and there is also a float-controlled valve (not shown) for limiting the depth of the water in the tub 10—24 when the drain valve is closed and the inlet valves are open, all as more fully described in the above-identified Bassett and Chamberlin application.

The saddles 50 and 52 are formed with relatively large openings 94, which make them lighter without sacrificing strength, and which also afford plenty of clearance for the movements of a drive unit. This unit preferably includes an electric motor 96 and an electrically-controlled two-speed transmission 98 rigidly secured together as a single rigid power plant.

The unit is provided with lateral arms 100 mounted (preferably by means of rubber bushings 102) on a stationary shaft 104. One end of the shaft 104 is supported in a bearing 106 carried by the saddle 50; the other end is supported in a socket 108 integrally formed in the casting 86, which is carried by the saddle 52.

The drive shaft of the transmission 98 carries a pulley 110 connected by a V-belt 112 to a pulley 114 on the shaft 30. Thus the weight of the pow-

er plant, tending to turn about shaft 104, keeps the belt 112 always tensioned and tight.

As fully explained in the above-identified Bassett and Chamberlin application, the above-described machine is operated automatically under the control of a cyclic switch such as is disclosed in Bassett application No. 6,425, filed February 14, 1935, or the one disclosed in Bassett application No. 78,635, filed May 8, 1936, in a definite washing-rinsing drying cycle.

For example, the inlet and drain valves and the motor and the transmission may be controlled so that (with the float valve switch) they give the following cycle: (1) soak and drain, (2) wash, (3) drain, (4) flush by injecting rinse water with drain open, (5) extract or dry, (6) rinse by filling tub with clean water, (7) flush by injecting water with drain open, and (8) extract. Of these steps, Nos. 5 and 8 take place at high speed, the others at low speed. Steps 6, 7, and 8 may be repeated one or more times. When the cycle is finished, the machine stops automatically, everything clean and dry, and with the clothes dry enough for ironing.

While one illustrative construction has been described in detail, it is not my intention to limit the scope of the invention to that particular construction, or otherwise than by the terms of the appended claims.

I claim:

1. A cleaning machine or the like comprising a base having transverse saddles rigidly secured thereto, a cylindrical tub member having a horizontal axis and resting in said saddles and adapted to contain a rotor for the material being cleaned, and means for securing said tub member to said saddles, said tub member including a drawn stamping having a cylindrical wall which is integral at one edge with a vertical wall formed with an opening through which said material may be introduced into the rotor and which wall is integral with a flange at its other edge, two generally conical disks arranged face to face, means securing the peripheries of said disks to said flange, and rotor-shaft supporting means mounted at the centers of said disks.

2. A cleaning machine or the like comprising supporting means including transverse saddles, a cylindrical tub member having a horizontal axis and resting in said saddles and adapted to contain a rotor for the material being cleaned, and means securing said member to said saddles, said tub member including a cylindrical wall having at one edge a vertical wall formed with an opening through which said material may be introduced into the rotor, two generally conical disks arranged face to face, means securing the peripheries of said disks to the other edge of said cylindrical wall, and rotor-shaft supporting means mounted at the centers of said disks.

3. A cleaning machine or the like comprising a generally cylindrical tub member including a drawn stamping having a cylindrical wall which is integral at one edge with a vertical wall formed with an opening through which material to be cleaned may be introduced, and which has an integral peripheral flange at its other edge, two generally conical disks arranged face to face, means securing the peripheries of said disks to said flange, and shaft bearings mounted at the centers of said disks.

4. A cleaning machine or the like comprising a generally cylindrical tub member including a drawn stamping having a cylindrical wall which is integral at one edge with a vertical wall, and

which has an integral peripheral flange at its other edge, two generally conical disks arranged face to face, a channel-section member encircling and securing the peripheries of said disks to said flange, and shaft bearings mounted at the centers of said disks.

5. A cleaning machine or the like comprising a generally cylindrical tub member having one end made up of two generally conical disks secured together face to face and provided with shaft bearing means at their centers.

6. A cleaning machine or the like comprising a tub member having a generally cylindrical wall and having one end made up of two generally conical disks secured together face to face and peripherally secured to the edge of said wall and provided with shaft bearing means at their centers.

7. A cleaning machine comprising a rotor including a generally cylindrical drum having an opening in one end and having an axial shaft projecting from its other end, oppositely-dished disks having at their centers supporting means for said shaft spaced apart a considerable distance axially of the shaft, and a generally cup-shaped member inclosing said rotor drum and having said disks peripherally secured to its edge.

8. A cleaning machine comprising a rotor including a generally cylindrical drum having an opening in one end and having an axial shaft projecting from its other end, disks spaced axially apart at their centers and having at their centers supporting means for said shaft engaging a considerable length of the shaft, a generally cup-shaped member inclosing said rotor drum and having said disks peripherally secured to its edge, a base rigidly supporting the cup-shaped member by engagement with its side wall, said drum and the vertical wall of said member having aligned openings opposite and coaxial with respect to said shaft, a motor mounted on said base and drivably connected to said shaft, and a door for the opening in said vertical wall practically closing the opening in the drum but without engaging the drum to interfere with its rotation.

9. A cleaning machine comprising a drum having a shaft projecting at one end and having an opening in the wall of its other end, a tub member inclosing the drum and having at one end bearing means for the shaft and having an

the wall of its other end an opening aligned with the opening in the drum, and a door closing the opening in the tub member and which is provided with a glass dished inwardly and having a central plane portion offset inwardly from the wall of the tub member and arranged in the plane of the end wall of the drum.

10. A cleaning machine or the like comprising a drum having a shaft projecting at one end, a tub member inclosing the drum and having at one end bearing means for the shaft, a base having spaced saddles in which said tub member is secured and one of which is formed with a relatively large opening, a pulley on the shaft, pivotal supporting means carried by said saddles below the tub member, a rigid motor-transmission unit extending through said opening and having laterally-extending arms pivoted on said means and provided with a drive pulley, and a belt connecting the two pulleys and tensioned by the weight of said unit.

11. A cleaning machine or the like comprising a tub member, a base having saddles in which said tub member is secured, brackets rigidly carried by the saddles and projecting laterally therefrom, brackets rigidly secured to the tub member and projecting upwardly and laterally therefrom, and top and side panels detachably secured to the brackets and forming a casing for the machine.

12. A rotatable drum for a cleaning machine comprising a perforated cylindrical member provided with inwardly-projecting outwardly-opening and generally V-section transverse ribs, an end member provided with an outwardly-extending shaft, another end member formed with an opening, and straps secured at their ends to the end members and arranged within and engaging and conforming to the shape of said ribs.

13. A cleaning machine or the like comprising washing means, a horizontal tub enclosing said means and having in its end an opening for introducing articles to be washed, a base supporting said tub, and panels detachably supported at least in part by said tub and the front one of which has an opening registering with the opening in said tub and the edge of which seals against the tub about the opening therein and which panels form a casing for the machine.

ADIEL Y. DODGE.