Jan. 11, 1938. G. W. JOHNSON 2,105,248

CLOSURE CONSTRUCTION FOR WASHING MACHINES

Filed Sept. 11, 1935

FIG.-1

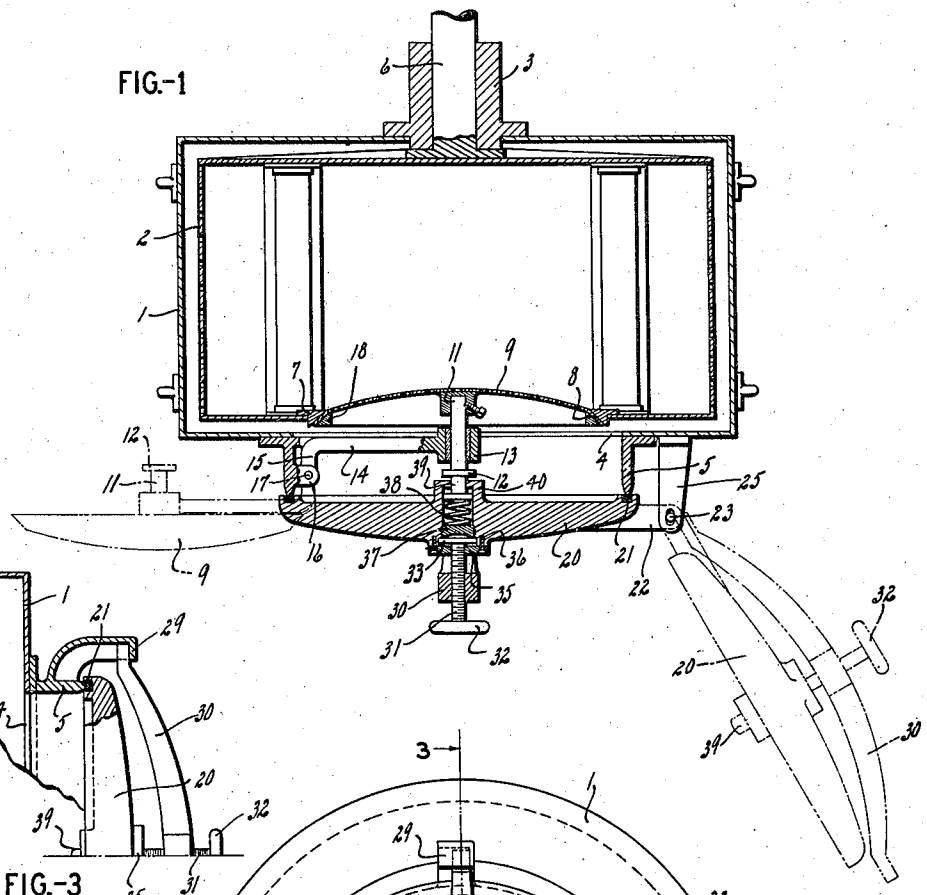


FIG.-3

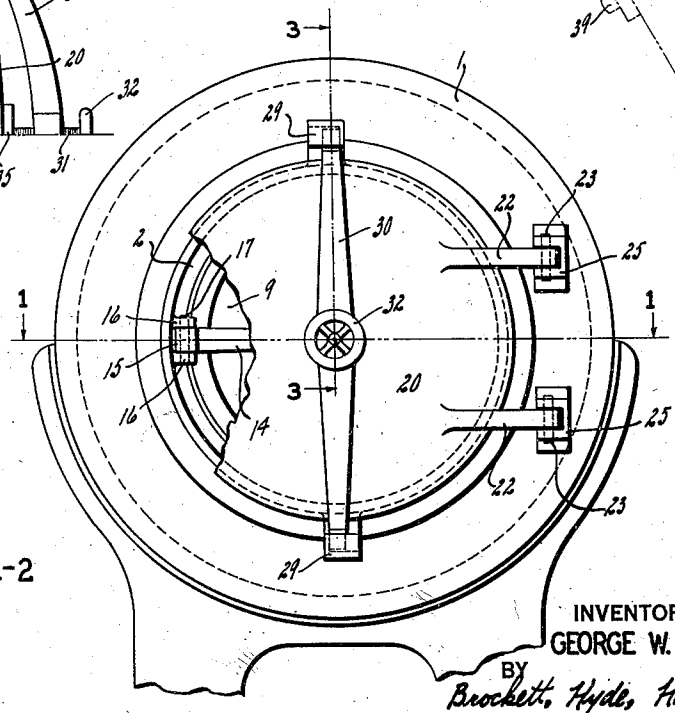


FIG.-2

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Patented Jan. 11, 1938 2,105,248

UNITED STATES PATENT OFFICE

2,105,248

CLOSURE CONSTRUCTION FOR WASHING MACHINES

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Application September 11, 1935, Serial No. 40,016

8 Claims. (Cl. 68—18)

My invention relates to washing machines or fabric treating devices having a stationary casing and an inner rotatable drum, and more particularly to an improved door or closure construction for such devices.

In providing a door or closure construction for washing machines or fabric treating devices having an outer stationary casing and an inner rotatable drum, it is desirable that the closures for the drum and casing should be so arranged that the goods or fabric being treated may be readily introduced into and removed from the inner drum. It is also important that the closure for the drum and the closure for the casing should make a tight engaging fit with the walls surrounding the respective openings so as to prevent the cleaning or treating fluid from escaping from the casing and the goods or fabric being treated from being caught in crevices or openings between the inner closure and the drum.

It is therefore an object of my invention to provide an improved washing machine or fabric treating vessel having an outer casing and an inner rotatable drum in which the closures for the casing and the drum are so arranged that the goods may be readily introduced into and removed from the drum at desired intervals.

Another object of my invention is to provide an improved washing machine having an outer stationary casing and an inner rotatable drum in which the door for the inner drum is pivotally mounted upon the outer casing in such a manner that it may be swung to open and closed position through the opening in the outer casing.

A further object of my invention is to provide an improved door construction for washing machines having an outer stationary casing and an inner rotatable drum in which the closure for the inner drum is yieldingly and rotatably mounted with respect to the outer casing.

A still further object of my invention is to provide an improved door construction for washing machines having an inner rotatable drum and an outer casing in which means associated with the closure for the casing serves to maintain the closure for the drum in a tight engaging fit with walls of the rotatable drum.

My invention will be better understood by reference to the accompanying drawing in which,

Fig. 1 is a cross-sectional view of my improved washing machine taken on the line 1—1 of Fig. 2,

Fig. 2 is an end elevational view, the door for the casing being partially broken away to show the manner in which the inner closure is connected to the casing; and,

Fig. 3 is a cross-sectional view on the line 3—3 of Fig. 2.

As illustrated in the drawing my improved washing machine or work treating device comprises an outer casing 1 and an inner rotatable drum 2. The outer casing is provided at one end with a bearing 3 and at the opposite end with an opening 4 which is surrounded by an annular flange or rim 5. The drum 2 is supported within the casing 1 by means of a shaft 6 which is affixed to the drum and extends through the bearing 3. A suitable gear or pulley, not shown, may be affixed to the shaft for rotating the inner drum.

Opposite the shaft 6 and substantially concentric therewith, the drum 2 is provided with an opening and the wall of the drum surrounding the opening is provided with an annular reinforcing ring 7 having a flared outer surface which is adapted to be engaged by the tapered ring portion 8 of a door or closure 9. The ring portion 8 of the door is bulged inwardly to form a substantially spherical portion extending into the drum. The arrangement of the inner door is such that it fits snugly against the reinforcing ring 7 and, notwithstanding minor irregularities in alignment, will rotate freely with the drum while the working portion of the door presents a substantially smooth surface with no cracks or crevices in which portions of the goods or fabric might be caught.

Affixed to the door 9 at a point substantially opposite the shaft 6 is a shaft 11 which is provided at its outer end with a head 12. Surrounding the shaft 11 is a collar 13 formed integral with a bracket 14 which extends in a plane perpendicular to the shaft 11 and terminates in an angular portion 15 which extends parallel to the flange 5. The angular portion 15 is disposed between lugs 16 and is pivotally mounted upon a pintle 17 supported by the lugs. The door 9 is provided at its outer margin with a reinforcing strip 18 which assists in maintaining a tight engaging fit between the tapered portion 8 of the door and the bevelled reinforcing strip 7 surrounding the opening in the drum.

The outer casing 1 is also provided with a door or closure 20, which is provided with a groove adjacent its inner margin for an annular sealing ring 21 which is adapted to engage the annular flange or rim 5 when the door is closed. Arms 22 fixed to the outer portion of closure 20 are mounted upon pintles 23 which are loosely supported in apertures formed in the outwardly ex-

tending arms of bifurcated brackets 25 which are supported on the casing 1.

Extending outwardly from the annular flange or rim 5 and disposed at opposite sides thereof is a pair of locking projections 29 which are adapted to receive the arms of a bridge 30. Midway between its ends, bridge 30 is provided with an aperture to receive a threaded shaft 31, the outer end of which is provided with a hand wheel 32, and the inner end of which is provided with a collar 33 which fits in a recess in the outer portion of the door or closure 20. The collar 33 is held in place by an annular plate 35 which is fastened to the closure 20 by any suitable means, such as screws 36.

Inwardly of the collar 33 closure 20 is provided with an aperture the outer portion of which is threaded to receive a plug 37. The plug 37 is adjustable and serves as an abutment for one end of a spring 38, the other end of which bears against the head of a pin 39. The opposite end of pin 39 extends through an opening in a boss 40 extending from the inner portion of closure 20.

In Fig. 1 of the drawing the closures are shown in dotted lines in their open positions. In opening the closures, hand wheel 32 is first turned to unlock the bridge 30 which is moved out of the locking projections 29 and closure 20 is then swung to the dotted line position. The bracket 14, together with the closure 9, is then swung through the opening formed by the rim 5 to its dotted line position. The goods or fabric to be treated are then placed in the machine, and bracket 14, which supports closure 9, is swung inwardly within the rim 5 and the tapered portion 8 of closure 9 engages the seat formed by the flared reinforcing strip 7. Closure 20 is then swung to closed position, the bridge 30 is turned beneath the locking projection 29, and hand wheel 32 is rotated which forces closure 20 firmly upon the rim 5 against the resilient action of sealing strip 21. When door 20 is closed, the end of pin 39 bears against head 12 of shaft 11 and spring 38 yieldingly maintains door 9 in closed position against its seat 7. Since the shaft 11 is rotatably mounted in collar 13, it will thus be seen that the closure 9 is rotatably and yieldingly mounted with respect to the outer casing.

From the foregoing specification it will be seen that I have provided an improved door construction for work treating devices or washing machines which is simple in operation, and by means of which the door for the drum and the door for the casing may be maintained in tightly sealed position and in which the door for the drum is rotatably and yieldingly mounted with respect to the outer casing. It will also be apparent that by simple operations the doors may be readily opened, the work inserted, and as the outer door is brought to closed position the inner door will be automatically forced in yielding position against the closure seat of the drum.

While I have described my improved door construction as being applied to washing machines or fabric treating devices, it will be understood that it may also be used in drying tumblers or other apparatus having an inner rotatable drum and an outer casing.

To those skilled in the art, many modifications of and widely differing embodiments and applications of my invention will suggest themselves without departing from the spirit and scope thereof. My disclosure and the description herein are purely illustrative and are not intended to be in any sense limiting.

What I claim is:

1. Apparatus of the character described, comprising a stationary casing having an opening, a drum rotatable in the casing having an end opening which registers with the opening in said casing and which is substantially concentric with the axis of rotation of said drum, a drum closure, a support hinged on the casing and in which said closure is rotatably mounted, and a closure for the casing mounted upon the casing for movement independently of said support, said drum closure when the casing closure is in open position being adapted by movement of its support to swing through the casing opening to or from closed position.

2. Apparatus of the character described in claim 1, provided with yielding means interposed between said closures when both are in closed position for yieldingly holding the drum closure in closed position.

3. Apparatus of the character described in claim 1, in which the casing closure is also hinged to the casing.

4. Apparatus of the character described in claim 1, in which the casing closure is hinged to the casing on an axis other than the axis of swinging motion of said support.

5. Apparatus of the character described in claim 1, in which the casing closure is hinged to the casing on an axis other than the axis of swinging motion of said support, and the axes of said casing closure and support respectively are on opposite sides of the axis of rotation of said drum.

6. Apparatus of the character described, comprising a stationary casing having an opening, a drum rotatable in the casing having an end opening which registers with the opening in the casing and which is substantially concentric with the axis of rotation of said drum, a drum closure movable to and from closed position and in closed position being arranged to rotate with the drum, a casing closure mounted upon the casing for movement independently of the drum closure, and yielding means between said two closures for yieldingly applying the drum closure to the drum when both closures are in closed position.

7. Apparatus of the character described in claim 6, in which the casing closure is hinged to the casing.

8. Apparatus of the character described in claim 6, in which the casing closure is hinged to the casing, and said yielding means is mounted to move with the casing closure.

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