

May 30, 1944.

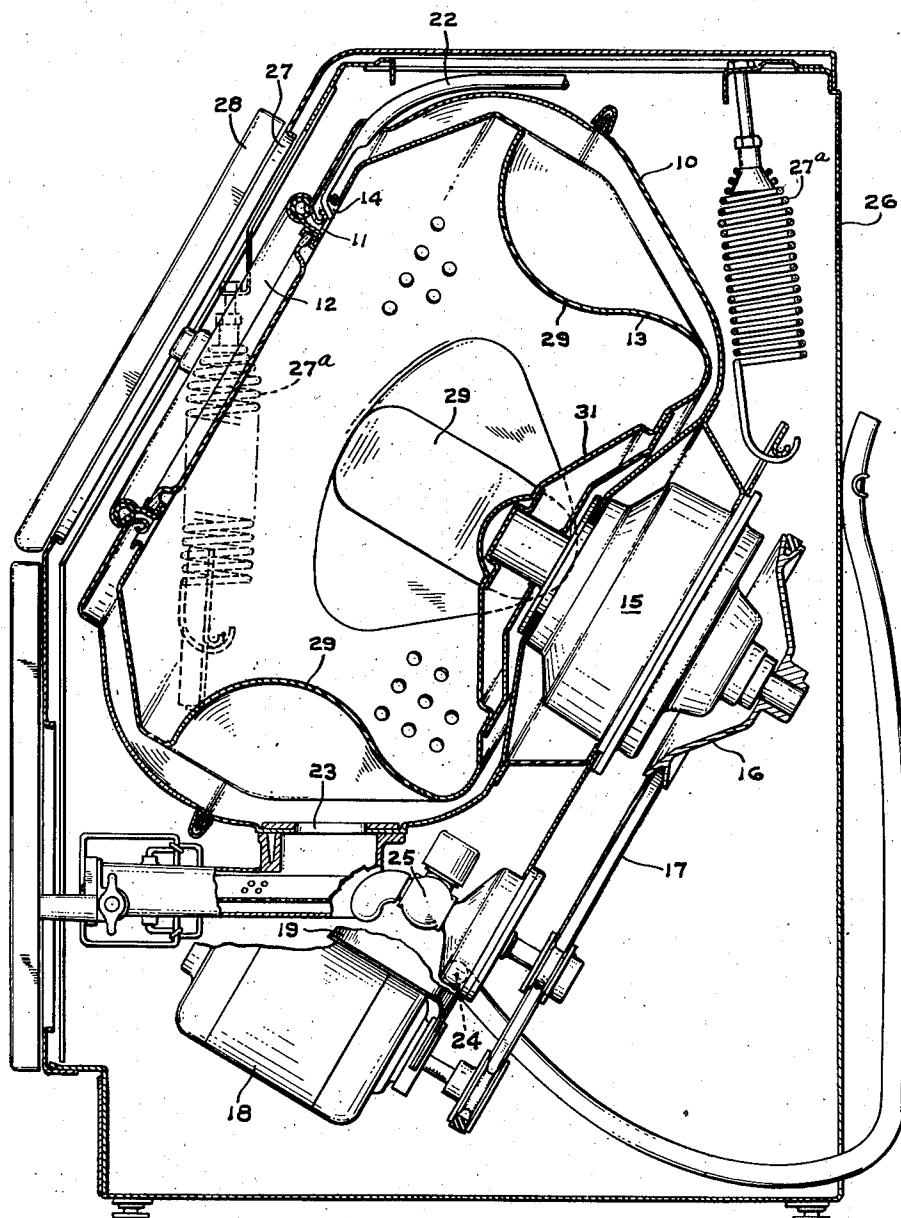
F. BRECKENRIDGE

2,349,901

ROTOR CONSTRUCTION

Filed Dec. 21, 1940

2 Sheets-Sheet 1



WITNESSES:

R. A. Ridge
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FIG. 1.

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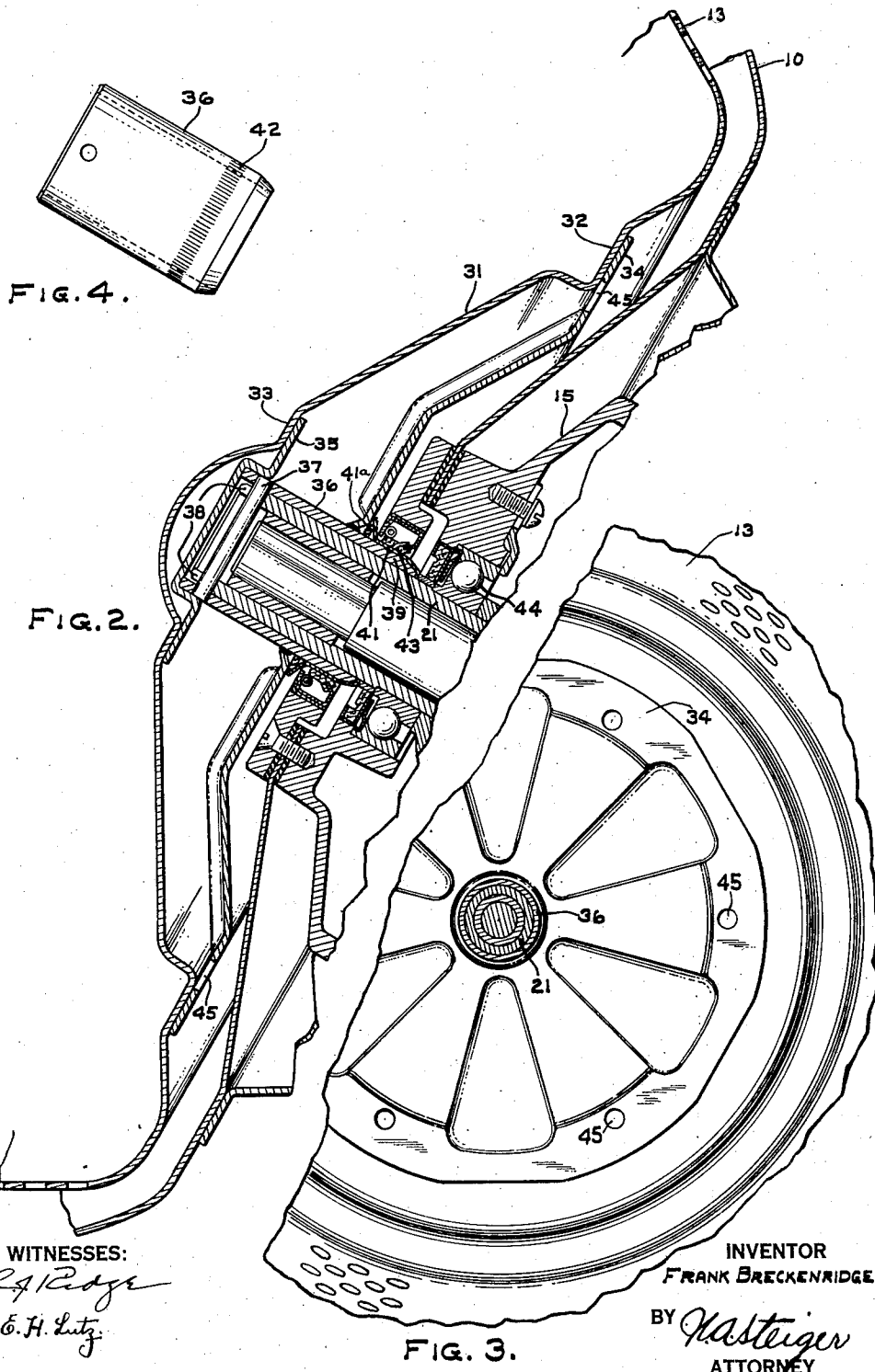
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WITNESSES:

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FIG. 3.

UNITED STATES PATENT OFFICE

2,349,901

ROTOR CONSTRUCTION

Frank Breckenridge, Mansfield, Ohio, assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application December 21, 1940, Serial No. 371,102

2 Claims. (Cl. 68-140)

My invention relates to rotor constructions, more particularly to rotors or basket structures of washing and spinning machines and has for an object to provide improved apparatus of this kind.

A further object of the invention is to provide an improved washing machine rotor that is rigid in construction and non-corrosive in operation.

It is a further object of the invention to provide and improved washing machine basket or rotor that may be provided with a vitreous enamel coating on all of its exposed surfaces.

These and other objects are effected by my invention as will be apparent from the following description and claims taken in connection with the accompanying drawings forming a part of this application, in which:

Fig. 1 is a vertical sectional view of one form of washing and spinning machine employing a rotor constructed in accordance with my invention;

Fig. 2 is an enlarged section of a portion of the apparatus shown in Fig. 1;

Fig. 3 is a partial end view of the rotor shown in Fig. 2 with the fluid-containing tube removed; and,

Fig. 4 is a view of the hub of the rotor.

Reference will now be had to the drawings and particularly to Fig. 1 thereof wherein I have shown my invention applied to a rotor or cylinder of a washing and spinning machine of the type disclosed in my Patent No. 2,296,257, granted September 22, 1942, and assigned to the assignee of the present invention. This form of washing and spinning machine includes a tub 10, generally of frusto-conical configuration and having an access opening 11 formed in the end of the tub 10 of relatively large diameter. The access opening 11 is closed by a suitable gasketed, hinged door 12. Arranged within the tub 10 is a perforate rotor or basket structure 13 generally of frusto-conical configuration for receiving the articles to be treated. The basket structure 13 is provided with an opening 14 in the large end thereof, which opening registers with the opening 11 in the tub structure 10. The basket 13 is arranged substantially coaxially within the tub 10 and, in the embodiment which I have chosen to illustrate, the axis of the basket is arranged at an angle of approximately 30° above the horizontal.

Rotation of the basket at relatively low speed of, for example, 50 R. P. M. for washing the fabrics and a relatively high speed of approximately 500 R. P. M. is provided by a two-speed mechanism generally indicated at 15 and carried

by the end wall of the tub of relatively small diameter. The two-speed mechanism 15 forms no part of the present invention so that it has not been shown in detail. Suitable mechanism of this type is disclosed and claimed in the patent of H. E. Edwards, No. 2,284,047, granted May 26, 1942, and assigned to the assignee of the present application. The two-speed mechanism 15 is driven at substantially constant speed by a pulley 16 and belt 17 connected to a motor 18, the latter being carried by a suitable bracket 19 supported from the tub structure 10. The variable speed driven element of the two-speed mechanism 15 is defined by a sleeve 21 (see Fig. 2).

Cleaning fluid is admitted to the tube and basket through a conduit 22 and the vitiated fluid is discharged from the tub through an outlet 23 which communicates with the inlet of a pump 24. Passage of fluid from the outlet 23 to the pump 24 is controlled by an electrically-operated valve 25.

The tub 10, the basket 13 and the two-speed mechanism 15 and the motor 18 define major elements of a unitary washing and spinning structure which is supported within a casing 26 in any suitable manner. Preferably, the unitary structure is supported by means of a plurality of springs 27a which permit vibrations of the unitary structure relative to the casing 26. The casing 26 is provided with an opening 27 which is closed by a door 28, the opening 27 affording access to the door 12 associated with the tub 10.

In operating the apparatus described heretofore, the fabrics to be treated are first disposed within the basket 13 and the motor 18 is energized. The two-speed mechanism at 15 at this time is adjusted by means (not shown) for effecting slow speed rotation of the basket 13 for cleaning the fabrics. During the cleaning operation, the fabrics are elevated in the body of fluid in the tub 10 by means of vanes 29 extending inwardly from the basket and are deposited on a dome 31 which is defined by a reentrant head portion of the basket 13. The fabrics slide from the dome or head 31 and are returned to the water and are again elevated by the vanes 29. When the cleaning operation is completed, the cleaning fluid is removed through the outlet 23 and the two-speed mechanism 15 is adjusted for its high speed operation. Subsequent to the draining of the cleaning fluid from the tub 10, and while the basket is operating at its relatively low speed, the fabrics collect on the end around the dome 31. As the basket 13 is accelerated, the fabrics

move along the frusto-conical side walls thereof in the region of the basket of relatively large diameter, in which region centrifuging of the fluid from the fabrics is effectively carried out. This method of cleaning the fabrics, then collecting them in the region of relatively small diameter and finally centrifuging the fabrics in the region of the basket of relatively large diameter is disclosed and claimed in my Patent No. 2,296,258, granted September 22, 1942, and assigned to the assignee of the present application.

During operation, and particularly during the accelerating and centrifuging periods, the basket 13 is subjected to strains caused by uneven distribution of the wet fabrics within the basket. These strains are imparted to that portion of the basket which defines its support or, in other words, to the re-entrant end wall 31. The out-of-balance forces tend to cause the basket 13 to precess, which movement is resisted by the re-entrant end wall structure 31. That portion of the basket structure which is directly associated with the re-entrant end wall 31 is more clearly shown in Figs. 2 to 4, to which reference will now be had.

In accordance with my invention, the re-entrant end wall 31 includes annular portions 32 and 33 which are disposed in parallel planes normal to the axis of the basket and which are connected by means of spaced walls or diaphragms 34 and 35 to axially-spaced portions of a cylindrical hub 36. The walls or the diaphragms 34 and 35 are secured to the portions 32 and 33 of the re-entrant end wall 31 preferably by roller or seam welding. The diaphragms 34 and 35 are secured as by welding at their inner portions to the hub 36. Prior to the latter operation, a pin 37 is disposed within openings formed in the hub 36 and is maintained in position by the diaphragm 35, a portion of which extends over the ends of the pin 37 as shown in Fig. 2. The pin 37 defines a driving element for the hub 36 as set forth more in detail hereinafter.

During high speed operation, the out-of-balance forces tend to precess the basket about its axis. Any such movement of the basket 13 relative its axis would be about a point adjacent the connection of the basket to the wall 35. Precessing of the basket, or wobbling of the re-entrant end wall 31 about the axis is resisted by the wall 34, the central portion of which is connected to the supporting hub 36 at a region thereof spaced from the point about which any precessing or wobbling would occur.

The hub 36 has an opening therein for receiving the driving sleeve 21 of the two-speed mechanism and the latter is provided with radially-extending slots 38 disposed diametrically of the sleeve 21 for receiving the pin 37. Accordingly, the hub 36 is driven through the pin and slot connection 37-38 by means of the sleeve 21. The hub 36 extends outwardly beyond the wall 34 as shown at 39 and is provided with a non-corrosive sleeve or runner 41. The runner 41 is preferably attached to the hub 36 by a driving fit and, in this connection, the hub is knurled as shown at 42 for maintaining the runner 41 in position. Leakage of water between the runner 41 and the hub 36 is prevented by a resilient collar or seal 41a which is compressed between these members and the wall 34.

A water seal 43 of any well understood construction is employed between the runner 41 and the casing of the two-speed mechanism 15 for

preventing the leakage of water from the tub 10. The driving sleeve 21 is journaled within the two-speed mechanism 15 preferably by means of anti-friction bearings, one of which is shown at 44.

As is well understood, it is highly desirable that a non-corrosive surface, such as vitreous enamel, be applied to the rotors of the type disclosed herein. In order that substantially every surface of the basket including its supporting walls 34 and 35 are vitreous coated, I provide openings, shown at 45, in the wall 34 preferably adjacent its outer periphery. During the dipping process or when the vitreous coating is applied to the basket structure, the solution enters the space intermediate the walls 35 and 34 so that the entire surface intermediate these walls is provided with a vitreous coating. Accordingly, all of the connections or joints between the re-entrant wall 31 and its supporting wall members 34 and 35 are protected against corrosion in service.

From the foregoing description, it will be apparent that I have provided an improved rotor for a washing and spinning machine which is of rigid construction and which may be readily coated with a vitreous enamel finish throughout substantially its entire area.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In a washing machine rotor construction, the combination of a basket including a side wall and a re-entrant end wall defining a dome within the side wall, a sleeve for supporting the basket and having an end thereof secured to a central portion of the dome, a reinforcing wall member secured adjacent its periphery to an outer portion of the re-entrant end wall, said wall member having an offset portion extending within the re-entrant wall and disposed generally in concentric relation with the re-entrant wall, said wall member having the central portion thereof secured to a portion of the sleeve axially spaced from said end thereof, a shaft carrying said sleeve, and a structure for rotatably supporting the shaft, said structure having a portion thereof extending within the offset portion of said wall member.

2. In a washing machine construction, the combination of a basket including a side wall and a re-entrant head defining a dome within the side wall, a sleeve for supporting the basket and having an end thereof secured to a central portion of the dome, a wall member secured at its periphery to an outer portion of the re-entrant wall, said wall member having an offset portion disposed within the re-entrant wall generally in concentric relation therewith and said wall member being secured to a portion of the sleeve axially spaced from said end thereof, a shaft carrying said sleeve, a container for washing fluid enclosing the basket and including a bearing structure for supporting the shaft and a fluid-tight seal associated with the bearing structure and said sleeve and disposed at least in part within the offset portion of the wall member.

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