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G. MARKOVICH

2,651,892

WASHING AND DRYING MACHINE

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3 Sheets-Sheet 1

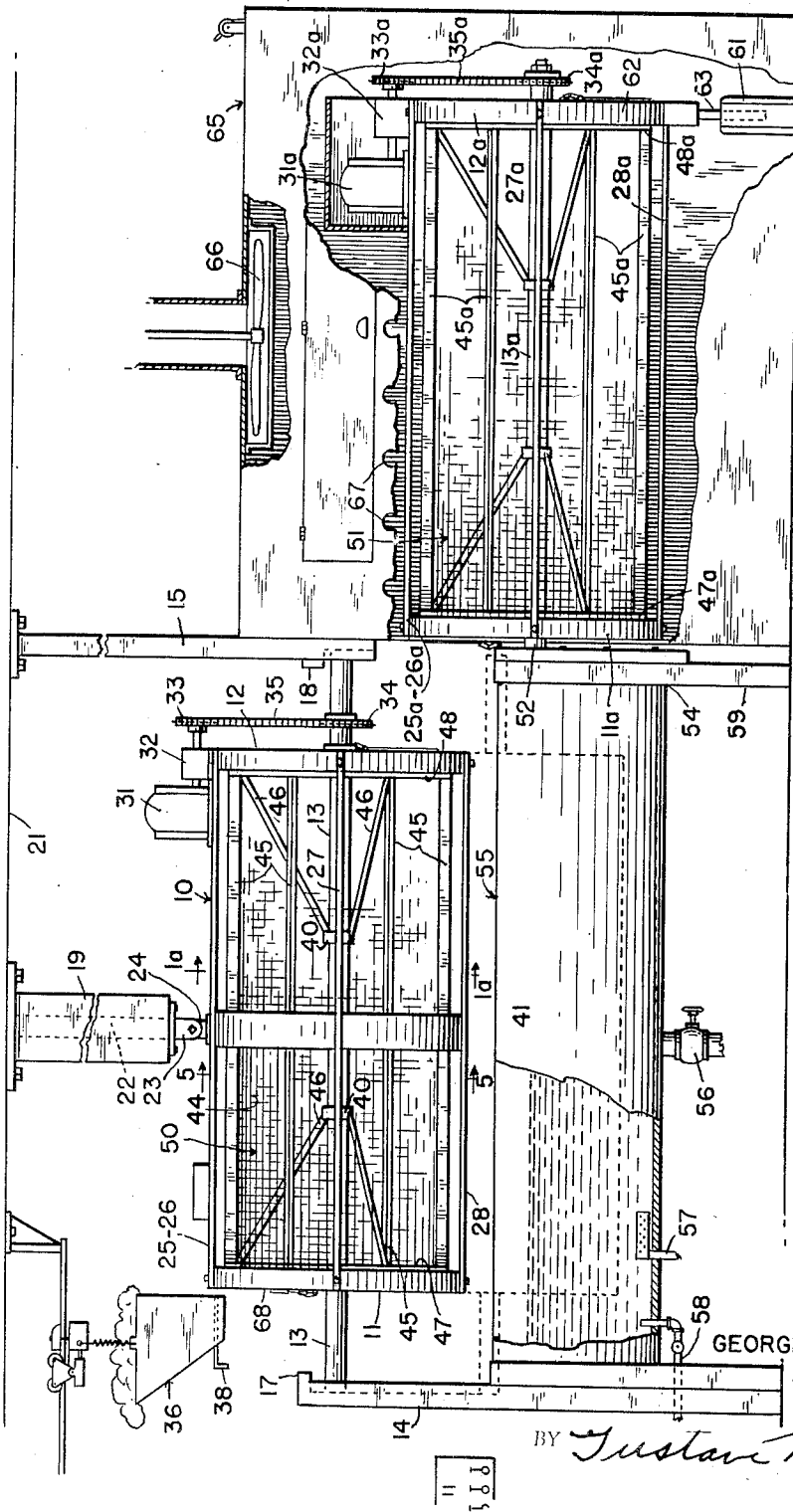


FIG. 1.

INVENTOR
GEORGE MARKOVICH

BY *Justav Miller*
ATTORNEY

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G. MARKOVICH

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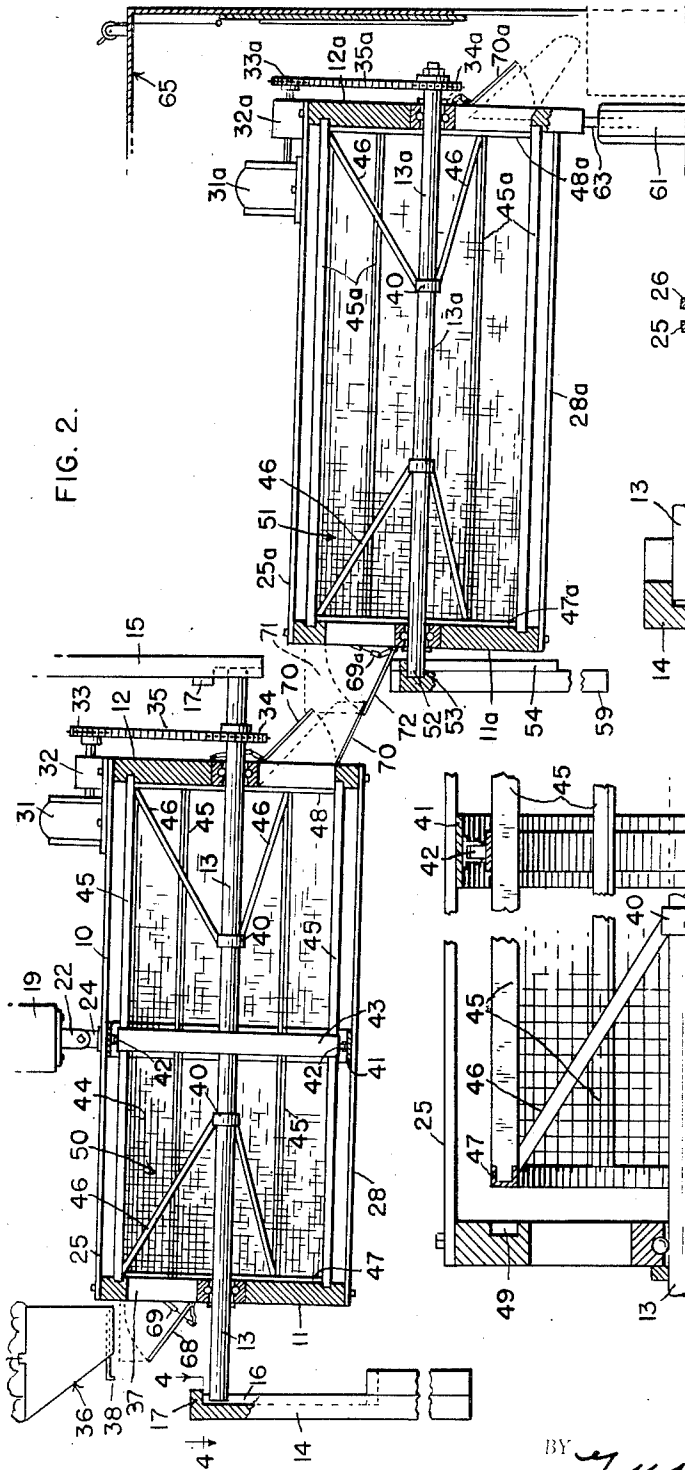


FIG. 2.

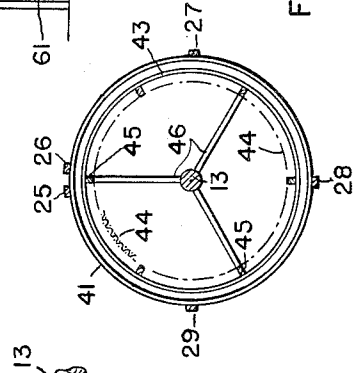


FIG. 3.

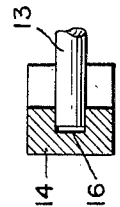


FIG. 4.

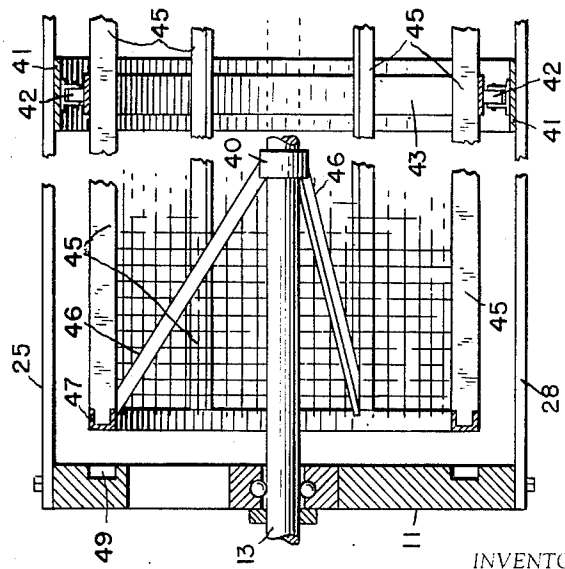


FIG. 1a.

INVENTOR
GEORGE MARKOVICH

BY *Gustav Miller*
ATTORNEY

Sept. 15, 1953

G. MARKOVICH

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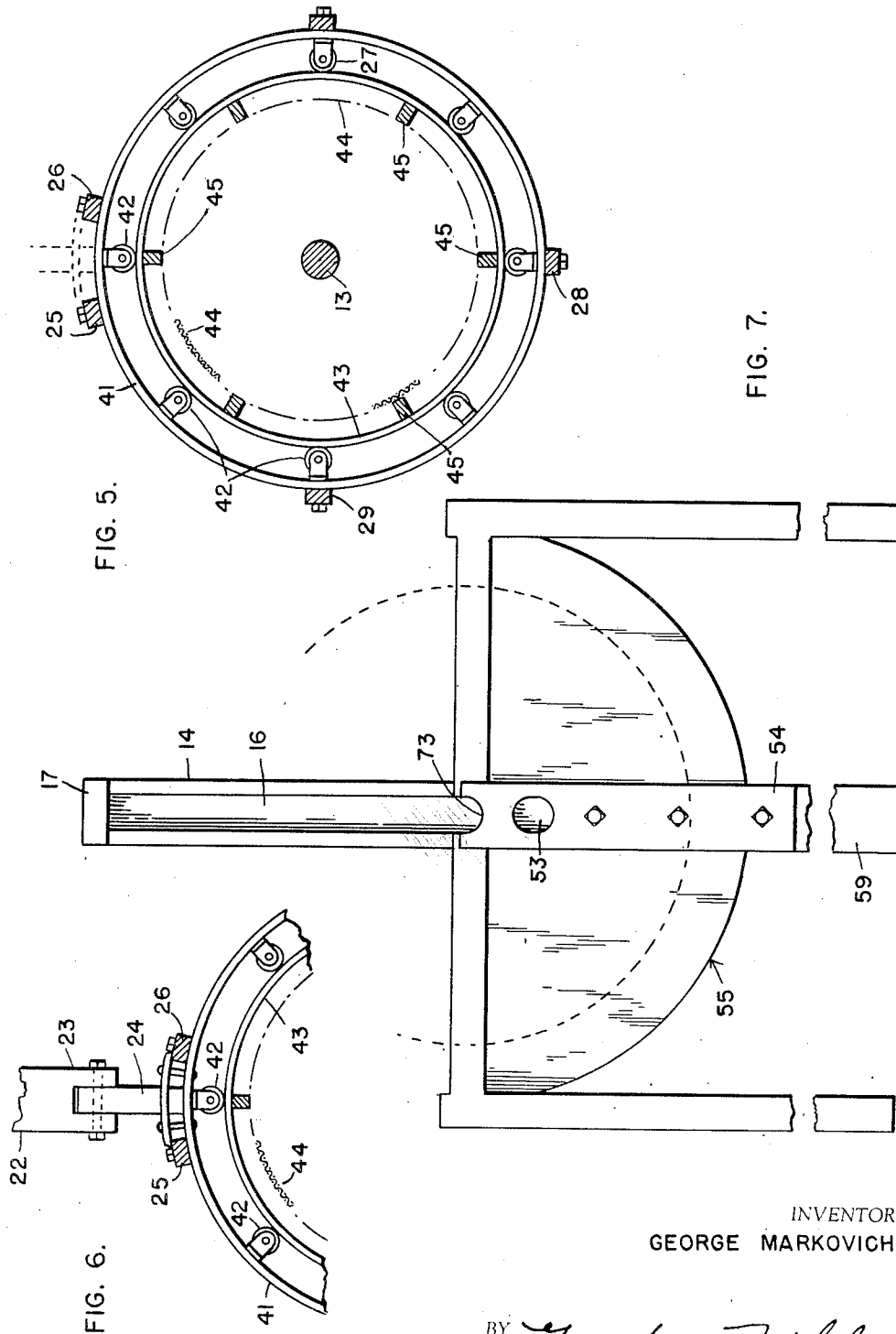


FIG. 5.

FIG. 6.

FIG. 7.

INVENTOR
GEORGE MARKOVICH

BY *Gustave Miller*
ATTORNEY

UNITED STATES PATENT OFFICE

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WASHING AND DRYING MACHINE

George Markovich, Akron, Ohio

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3 Claims. (Cl. 51—164)

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The present invention relates generally to washing and drying machines and specifically to washing machines and drying machines of the cylindrical and horizontal type having end feed and end discharge openings.

The washer of this invention is of the heavy duty type used in industry to degrease and cleanse rubber, plastic, or metallic objects of manufacture. Such washers are subject to rapid deterioration of their cylinders in the solvents or caustic solutions in which their parts operate.

A principal object of the invention therefore is to provide a washer and drier having interchangeable cylinders so that the drier cylinder can be used in the washer and vice versa. The washer cylinder being subject to corrosive fluids is most likely to wear out first and by using the drier cylinder as a replacement for the washer cylinder for some particular solvents or acids, the use life of the two cylinders can be appreciably extended.

A further object and advantage of the invention is the provision of identical cylinders or barrels in the washer and drier units so that fewer parts are needed and ease of manufacture or repair is assured.

A still further object is to provide a horizontally rotating cylinder in the washer unit which is suspended at or near its middle and center of gravity, and may be tilted to discharge while still rotating without loss of speed or cessation of rotation, which causes wet or degreased parts to stick and spot each other before reaching the drier.

A still further object is to provide a hydraulically driven tilting device for both the washer and for the drier, and one of simple and inexpensive construction and maintenance.

These and other objects and advantages of the invention will become apparent by reference to the following drawings in which:

Fig. 1 is a plan view in elevation of the washer and drier of this invention, with portions in section.

Fig. 1a is an end view in section taken on line 1a—1a of Fig. 1.

Fig. 2 is a plan view in elevation of a portion of the washer-drier with the loading and discharging doors in open position.

Fig. 3 is a detailed view in section of one end of the washer or drier cylinder in position extended out of the end drumhead to show the construction.

Fig. 4 is a detailed sectional view on line 4—4 of Fig. 2.

Fig. 5 is a sectional view on line 5—5 of Fig. 1.

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Fig. 6 is a detailed plan view of the main support of the washer cylinder, and

Fig. 7 is an end view of the tub of the washer showing its three supporting legs.

Referring to the drawings, in which like numerals indicate like parts throughout the several views, in Figs. 1 and 3, the washer 10 is shown composed of end drumheads 11 and 12 on axle 13 which is shown to be held against sidewise or endwise movement in posts 14 and 15 by means of the groove 16 cut therein, shown more clearly in Fig. 4. Stops 17 and 18 on posts 14 and 15, respectively, are provided to limit the upward movement of washer 10 and to keep it level.

A central support post 19, depending from the ceiling 21 or other overhead support has within it a hydraulic ram 22, the end of which is formed as a clevis 23 (shown in Fig. 6) in which is pinned swivel 24. In Figs. 1, 3 and 5 it will be seen that frame members 25, 26, 27, 28 and 29 extend the distance between drumheads 11 and 12 and form supports therefor, members 25 and 26 also forming the supporting bed for motor 31 and reduction gear 32 which by means of spur gears 33, 34 and chain 35 drive the axle 13. Loading bucket 36 is here illustrated to show the relative position of the feed port 37 in drumhead 11. A stop 38, bolted to member 25 holds the bucket 36 from side sway. Members 25 to 29 form an outer cage for the washer and provide a support on their inner sides for bearing ring 41 as seen in Fig. 5. Bearings 42 bear on support ring 43 which in turn is secured to and supports screen 44 on rods 45. Diagonal braces 46 are bolted to collar 40 and secure the axle 13 to the end rings 47 and 48 which rotate in groove 49 (Fig. 3) and lend endwise support to the end rings 47 and 48. It will be seen that braces 46 coincide with certain of rods 45, adding strength to the washer cylinder 50 as formed by the screen 44 and other parts as set forth above.

The identical construction is followed in the drier 51, with the exception of the bearing ring 41, bearings 42 and support ring 43, which is a unit in itself and is readily attached to rods 45a of the cage of the drier 51. Axle 13a of the drier differs also, being shorter and being supported at end 52 in a socket 53 formed in the tub end 54. Tub 55 of the washer 10 is of conventional semi-cylindrical shape having a water inlet 56, a drain 56 and steam coil 57 also of conventional design. Leg 61 supports the other end 62 of the drier 51 on a similar hydraulic ram 63, permitting the drier to be lowered for discharge of its contents as will hereinafter be described.

The drier portion 51 of this invention has a

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similar motor 31a and reduction gear 32a similarly supported on the frame members 25a, 26a. Surrounding the drier is housing 65 having exhaust fan 66 and a source of heat, here shown as a row of infra-red bulbs 67 which provide heat to the articles in the drier 51.

As will be seen in Fig. 2 the loading door 68 is hinged on drumhead 11 and is operated between open and closed position against port 37 by hydraulic piston 69, and an unloading door or gate 70 on drumhead 12 falls between chute sides 71 to lie on top of door 72 which is hinged downwardly from the drumhead 11a of drier 51, which door 72 is similar to and replaceable with door 68 of the washer, and has a similar hydraulic piston 69a. An unloading door or gate 70a is hinged on drumhead 12a of the drier and is similar to gate 70. Spur gears 33a, 34a, and chain 35a are also interchangeable with the same parts on the washer 10, and require only clamping on the axle 13a to use either of cylinders 50 or 51 in the washer position. In Fig. 7 it will be seen that the tub 55 has two central posts 14 and 59, the latter having the socket 53 for axle 13a and a half-bearing 73 for axle 13.

In operation the hydraulic ram 22 raises or lowers the cylinder 50 while the motor 31 turns the cylinder. Swivel 24 permits the cylinder of the washer to tip downwardly at the discharge end, or to permit the whole cylinder to swing 90° to unload into another conveyor. The loading doors 68 and 72 of the washer and drier operate by the ram 63 and piston 69 respectively and the chute sides 71 of the drier clear the axle 13 of washer as it is lowered or raised, the door 70 being raised for its passage.

The advantages of the interchangeable cylinders are believed to be obvious, and while the screens and cylinders may be constructed of wire cloth, plastic, or other materials to the best of advantages, it is to be understood that the invention is not to be limited to those materials but other materials and various modifications may be used and practiced without department from the spirit and scope of the invention.

What is claimed is:

1. In a device of the character described, a washer drum comprising an elongated cylindrical shaped frame, a pair of stationary drumheads secured one to each end of said frame, a

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feed port in one of said pair of drumheads and a discharge port in the other, a hinged door on each of said ports, an annular channel on each of said drumheads inwardly disposed and adapted to receive an annularly shaped support member with relatively rotary movement therebetween, a mesh cylinder disposed within said frame attached to a pair of annular support members one at each end thereof, each of said annular support members being rotatably positioned in its associated annular channel in a drumhead, and driving means for said cylinder including an attached axle rotatably supported at each end in said drumheads.

2. In a device of the character described, a washer or drier drum comprising a substantially cylindrical frame, a stationary drumhead at each end of said frame and secured thereto, port means in each drumhead, a cylindrical body rotatable within said frame open at each end to receive or discharge through said port means, an annular channel in each drumhead, a bearing member on each end of said cylinder adapted to be supported in said annular channels, and driving means for said cylinder including a centrally disposed axle secured to said cylinder and supported by bearings in each of said drumheads.

3. In a device of the character described, a washer or drier drum comprising a pair of stationary drumheads spaced from each other by at least one frame member, a mesh cylinder between said drumheads, an annular bearing on each end of said cylinder, an annular bearing receiving means in each drumhead, an axle centrally disposed in said cylinder and secured thereto, a bearing in each drumhead engageable with said axle, and driving means for said axle secured to said frame member.

GEORGE MARKOVICH.

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