TUMBLER TYPE CLOTHES-WASHING MACHINE HAVING CONTINUOUS LIQUID FLOW

Max Hirsch, Chicago, Ill.

Application July 25, 1944, Serial No. 686,878

3 Claims. (Cl. 68--58)

1. This invention relates to machines for washing and otherwise treating fabrics and other substances.

The term "soil" as used herein is intended to include stains and other foreign matter.

An object of my invention is to provide a machine for eliminating soil from fabrics, such machine, for accomplishing a given quantity of work, being required to be a small fraction of the size and weight, and accordingly will consume a small fraction of the power and, when used for washing fabrics, will require water of considerably lower temperature, compared to the most efficient machine now in use.

An additional object is to provide one machine by which one operation or cycle, that is, the period of time from the loading thereof with soiled fabrics, to the time of discharge of such fabrics completely soil and germ free and with a moisture content suitable for ironing, so that no further drying is required, will be a very small fraction, on the order of one-tenth, of the time now required for accomplishing the same results on the same quantity of fabrics with the most efficient machines now in use.

It is another object of my invention to provide a laundry machine whereby elimination of soil from fabrics may be effected with substantially smaller quantities of soap, detergents, bluing and cleaning fluids than has heretofore been possible.

Another object of my invention is to provide a machine for eliminating soil from fabrics in a small fraction of the time heretofore consumed.

A further object of my invention is to provide a laundry machine of the centrifugal type, including a clothes-containing drum constructed to continuously admit fresh clothes-treating liquid and continuously and finally discharge spent liquid, and a supply of liquid in stream form for the drum.

Further objects and advantages of my invention will appear as the description proceeds. The invention will be better understood upon reference to the following description and accompanying drawings, in which:

Fig. 1 is a side elevation, partly in section, of an embodiment of a laundry machine in accordance with my invention.

Fig. 2 is a sectional view, with parts broken away, taken as indicated by the line 2--2 in Fig. 1.

Fig. 3 is a side view, partly in section and partly in elevation, of the washing drum, taken as indicated by the line 3--3 in Fig. 2.

Fig. 4 is an enlarged fragmentary sectional view taken as indicated by the line 4--4 in Fig. 3.

Fig. 5 is an enlarged fragmentary isometric view, partly broken away, of the main section of the hub structure and certain of the associated spokes shown in Fig. 3.

Fig. 6 is an enlarged side elevation of the locking lever shown in Fig. 4.

Fig. 7 is an enlarged elevation of a link associated with the levers of Fig. 6 in the arrangement shown in Fig. 4.

Fig. 8 is an enlarged fragmentary sectional view taken as indicated by the line 8--8 in Fig. 2.

Fig. 9 is a reduced fragmentary view, partly in section and partly in elevation, taken as indicated by the line 9--9 in Fig. 8.

Fig. 10 is a reduced fragmentary view, partly in section and partly in elevation, taken as indicated by the line 10--10 in Fig. 8.

Fig. 11 is a fragmentary view showing a modified drum construction.

Fig. 12 is a side view, partly in section and partly in elevation, of a dolly for removing and returning the rotary cylinder or drum of the washing machine.

Fig. 13 is a fragmentary rear elevational view of the dolly taken as indicated by the line 13--13 in Fig. 12.

Fig. 14 is a top plan view of a side of the dolly shown in Figs. 12 and 13.

Referring now more particularly to the drawings, there is shown in accordance with my invention a housing or casing 23 comprising essentially a stationary part or frame 21 open at the front as indicated at 22 and having a base 23, adapted to be bolted or otherwise suitably secured to a floor or foundation 24, and two moveable parts 25 and 26 which function as doors. For some purposes, as will appear, the door 26 may be omitted. The frame 21 has a hood 28 which may be in the form of a part-cylinder, and side walls 30 and 32 to which are welded at 34, or otherwise secured, horizontal co-axial journals 36 in which are disposed bearings 38 in which run stub shafts 40. Keyed as at 42 to one of the stub shafts 40 is a pulley 44 connected by one or more belts 46 to a drive pulley 48 mounted on the shaft 50 of a motor 52. The motor 51 may be mounted in any suitable fashion and in any suitable position. For example, it may be mounted by means of a pivot 54 on a bracket 56 welded as at 58 to the rear 59 of the frame 21, adjustment of slack in the belts 46 being taken up as at 60. A chain and sprocket or other alternative drive may be employed.

My laundry machine contemplates the use of a two-section clothes-carrying drum 64 (Figs. 1,
comprising a container section 85 and a door section 66 and adapted to be rotated about a horizontal axis by the motor 252. Each side 101 of the drum 64 has a hub 68 comprising an annular plate 70 and a sleeve 72 integral or welded or otherwise suitably connected together, and means including a shaft-receiving member 74, having an annular locating flange 76 received in a said sleeve and an attaching radial flange 77 secured as at 78 to said plate. Each hub member 74 has a boss 80 (Figs. 2, 8, 9 and 10) having a right-angular V-notch 82 for receiving and engaging two spaced end 86 of the adjacent driving shaft 40. The boss 80 has at one side an ear 88 (Figs. 8 and 9) spaced from the attaching flange 77 and from the free end face 90 of the boss. A releasable block 94, having a right-angular V-notch 96 for receiving and engaging the remaining two sides 98 of the squared end 86 of the driving shaft 40, is forked to provide spaced arms 100 between which the ear 88 is disposed, said block being pivoted to the boss 80 by a pin 102 passing through aligned holes in said arms and ear. Also disposed between and pivoted as at 110 to the fork arms 100 is a lever 112 whose purpose will appear, said lever having a lug 114 engaged with the outer end 116 of a pin 118 longitudinally slidable in a bore 120 in the block 94, a spring 122 in said bore constantly biasing said pin toward said lug so as to urge said lug to rotate about the pivot 110 in a direction which in Fig. 6 is clockwise.

The boss 80 has at the side thereof opposite the ear 88 a second ear 128 likewise spaced from the attaching flange 77 of the hub member 74 and from the free end face 90 of the boss. At the opposite sides of and pivoted as at 128 to the ear 126 are links 130 which are also pivoted as at 122 to a latch lever 134. The lever 134 has a nose 136 with a rounded end 138 engageable in a rounded socket 140 in a lug 142 at the side of the block 94 opposite the fork arms 100, said lug projecting between the links 130. The lever 134 opposite the nose 136 has an arm 144 which is preferably hollowed out as at 146 to afford a handle 148 and which, at its free end, has a latch projection 150 adapted to be retained by a shoulder 152 on the arm 154 of the lever 112, whereby the lever 112 constitutes a keeper for the latch lever 134.

When the parts are disposed as shown in Figs. 2, 6, 9 and 10, the squared end 86 of each stub shaft 40 is securely clamped between the boss 80 and the block 94, so that the drum 64 is mounted on the stub shafts 40 and is rotated by the motor 252 through the stub shaft driven thereby.

In accordance with my invention, the drum 64 is adapted to be released from the stub shafts 40, so that the drum may be lowered for removal through the front opening 22 in the frame 21. This is accomplished by pressing the arm 152 of the lever 112 to the left (Fig. 8) against the resistance of the spring 122 until the shoulder 150 of the arm 152 is clear of the projection 140 on the lever 144, then grasping the handle 148 and raising it. As the handle 148 is raised, the nose 136 of the latch lever 134 exerts a prying force upon the wall 140 of the lug 142 as at 154, causing the pivot pin 132, and, with it, the links 130 to swing about the lower pivot 128. The nose 136 at the beginning of this operation is arranged so that it occupies a substantially desirable position relative to the pivots 126 and 132, and, at the conclusion of the swinging movement of the handle 144, is sufficiently beyond the dead center position to enable the lever 134, pivot 132 and links 130 to swing completely to the right (Fig. 8) so as to provide full clearance for upward swinging of the lug 142 about the pivot 128. Thereupon, each lug 142 is pulled up so as to swing the block 94, from which it projects, at least substantially 90° so as to pass downward with the drum 64 without obstruction from the associated squared shaft end 86.

Provision is made to support the drum 64 so that it will not fall when the release above described is effected. To this end, I provide a dolly 182 having front wheels 184, rear casters 186, side plates 188 connected as by tie rods 189, a reinforcing and caster-supporting plate 170 integral with or suitably connected to the side plates, drum-supporting levers 172 pivoted as at 174 to the side plates, and a lever-controlling handle 176 mounted to rotate with a pivot member 178 journaled in bearings 179 carried by the side plates 188. For controlling the levers 172, cams 180 are secured to the pivot 178 for rotation therewith, each cam having sliding bearing engagement with a bearing plate 182 secured to an arm 184 of each lever 172. The cams 180 are so arranged that they depress the arms 184 to the utmost when the handle 176 is in its uppermost position, shown in full lines in Figs. 12 and 13, and least when the handle is lowest as shown by the dash-dot lines in Fig. 12.

When the handle 176 is swung from its uppermost position, each cam 180 permits the heavier arm 184 of each lever 172 to descend. Each arm 184 is forked at its free end 186 to forked pins 192 in which are journaled spaced rollers 194 which, with the like rollers on the arm 184 of the other lever 172, serve as a cradle for the hub bosses 80 on the drum 64. Accordingly, when it is desired to remove the drum 64 from the frame 21, the front of the frame is opened by means and in a manner herein described, the handle 110 of the dolly 162 is swung downward to the dash-dot line position (Fig. 12), the dolly is then shoved up a ramp 195 and through the front opening 22 of the frame and onto the frame floor 196 and stopped by the abutment 197 in the frame, whereupon the cradle rollers 194 are properly positioned below the hub bosses 80 at the opposite ends 87 of the drum. The drum is rotated, if necessary, by hand, the drum is then substantially loweredmost as shown in Fig. 8. Thereupon the handle 176 is swung upward, the cams 180 acting upon the bearing plates 182 to elevate the lever arms 186 until the cradle rollers 184 are substantially engaged with the bosses 80. The dolly 162 is so designed with reference to the drum 64 and mounting therefor that the cradle rollers 184 are in the aforesaid position when the handle 176 is in its uppermost position, the axis of the cam 180 and the line of engagement of each cam with the bearing plate 182 then being in substantially dead center relation, so that, when the drum 64 is released from the stub shaft 40 as above described, the weight of the drum effectively holds the levers 172 and cams 180 frictionally against incidental rotating movement.

Now upon release of the drum 64 from the stub shafts 40, the bosses 80 come to rest on the cradle rollers 144 and the drum is then supported in its entirety by the dolly 162. The handle 176 is then turned to permit the drum 64 to descend until it comes to rest on the tie rods 189, and when that occurs the dolly shifts substantially to the position shown at 181 and then the periphery of the drum to the position at 180. The dolly 182...
may then be withdrawn from the frame 21 and, for this purpose, the pivot member 176 extending between the cams 180 may be used as a handle and whereby the dolly may be pulled out of the housing. This shift of the drum enables the drum to clear the upper limit of the front opening 22 in the frame 21. The drum 64 then is transported by an unloading device, is then opened by means and in a manner hereinafter described, with removal from the dolly, so that the fabrics which have been treated may be removed therefrom, and so that fabrics to be treated may be loaded therein, is re-closed by means and in a manner hereinafter described, and then replaced by means of the dolly in the position from which it was taken, whereupon the drum is elevated by the cams 180 in pursuit of rotation of the handle 176 into position to be mounted on the stub shafts 40 in a manner substantially the reverse of that above described. The drum 64 is then mounted on the stub shafts, the dolly removed, and the shield 25 lowered to close the opening 22 in the frame 21 preparatory to another treatment operation. In the process of re-mounting the drum on the stub shafts 40, the block 94 is first swung into place, and then the links 130 and lever 134 are swung toward their final positions, the lug 145 on the lever 134, during its final movement, engaging a cam surface 200 on the keeper lever arm 152 and then snapping into position under the keeper shoulder 150.

The drum container section 65 may extend throughout about 270° and the drum cover or door section or sector 66 the remaining 90°, although suitable different proportions may be used. The container section 65 comprises intermediate T-spokes 202 and angle end spokes 204, all welded or otherwise suitably secured to the annular plate 70 and to angular rim members 206. The free surfaces 208 of the end spokes 204 are adapted to have flatwise engagement with complementary surfaces 210 on the end angular spokes 212 of the sector 66, in which one or more intermediate T-spokes 214 may be provided and connected to a hub member 215 and angular rim members 216.

Each annular plate 70 has an eye 217 in partially overlapping relation to each end spoke 204 associated therewith. Links 218 are disposed at the opposite ends of each eye 217, one end 219 of each link 218 being employed for securing the pivot pin in assembly therewith and with the eye. The other ends 223 of the links 218 are connected by means of a pivot pin 224 disposed therein and held as by another pin 222, said pivot pin 224 passing through an opening 226 in a control lever 228 having a handle 229. Welded or otherwise suitably mounted on each end spoke 212 of the sector 204 is a lug 230 having a preferably cylindrical recess 233 in which a cylindrical projection or nose 234 on the lever 226 is adapted to engage and slide, the projection 234 being disposed between the pivot pins 220 and 224 when the sector 66 is assembled with the section 65. When the parts are so assembled, the nose 234 in engagement with the recess 223 is preferably slightly to the left of dead center relation to the pivot pins 220 and 224 as seen in Fig. 4, so that when the parts are arranged as shown in Figs. 3 and 4, the door sector 66 is securely locked to the container section 65. The sector 66 thus serves to completely close the door, which is removed to permit the loading or unloading of clothing into and from the container section 65, and can be readily returned and locked in place as aforesaid to provide a complete drum structure.

For commercial installations it may be desirable to so construct the drum that the door sector 66 is completely removable from the container section 65, as shown in Fig. 3 and above described. For domestic purposes, it may be preferred to hinge the door section 66 to the container section 68, as shown at 244 in Fig. 11.

Further in accordance with my invention, a pipe 250 to which water, soaps, detergents, bleaching and cleaning liquids, and other treating materials, or any one or more of such materials, may be fed by a pump (not shown), is secured as at 252 at the outer surface of each of the sides 30, 32 of the housing frame 21, each such side having a hole 254 in communication with the pipe. A manifold or plenum 256 in the form of a torus, affords a circular chamber 258, is secured about each journal 38, as at 262, at the inner surface of each side of the housing frame 21, and has a passage 262 communicating with the hole 254 so as to receive liquid from the associated pipe 250. Spray tubes 264 radiate from and are threaded as at 266 to the plenum 256 and communicate therewith and extend radially substantially as far as the drum 64. Each tube 264 has a longitudinal series of discharge ports 268 extending toward the adjacent end 67 of the drum 64, so as to discharge liquid shower-fashion outwardly toward the side of the drum. The outer end of each tube 264 is closed in any suitable way, as by a cap 270 threaded thereto.

Each side 61 of the drum is perforated and, to this end, there is provided or otherwise attached to and between the ribs 280 of consecutive spokes of the drum, including the door sector 66 as well as the container section 65, a series of arcuate bridging fins 282, co-axial with the drum, each fin being flared outwardly toward the other end 67 of the drum in such fashion that there is provided between each consecutive pair of such fins an arcuate passage 284 disposed to receive liquid sprays from correspondingly positioned discharge ports 280 in the adjacent series of spray pipes or tubes 264, so that such liquid sprays produced under pressure, pass through the passages 284 and impinge on the fabrics carried by the drum 64. Only a few of the fins 282 are shown, however, to avoid tedious repetition.

The cylindrical periphery 300 of the drum 64 is also perforated and, to this end, comprises, in addition to the angular rim members 205 and 208 of the container section 65 and door sector 66, respectively, connecting the rods or bars 293 of T-section and intervening series of fins 254, which, like the bars 293, bridge the rim members. The series of fins 294 between each pair of consecutive bars 293 may all incline alike, or, as shown at 295 and 296, may be arranged in oppositely inclined sets. The latter arrangement is preferred since it is conducive to separation of fabrics from the top of the drum in multiple suds washing. These fins are spaced apart to provide passages 298 through which the liquid and entrained soil or other foreign material is discharged centrifugally after passing through the fabrics in the drum. The fins 294 are disposed throughout the entire periphery 300 of the drum 64, including the door sector 66 as well as the container section 65, only a few of the fins being illustrated, however, to avoid tedious repetition.

The housing door 256 is made imperforate and is in the form substantially of a sector of a cylinder, with a cylindrical periphery 306 and plate-like
sides 308 welded or otherwise secured to circular hubs 310, each hub having side bearing engagement with the inner surface of the adjacent side wall 30 or 32 of the housing frame 21, and surrounding and having rotary bearing engagement with and supported by the plenum 256. The free upper margins of the door 25 are flanged outwardly as at 312. The housing frame 21, at the opening 27 thereof, is reinforced externally as by angle iron members 316, and internally by additional angle iron members 320, and a gasket 322 is secured to the inner face of the inwardly projecting flanges 324 of the angle members 320. When the door 25 is closed, as shown in Fig. 1, leakage of liquid from the frame 21 past the top and sides of said door is precluded by the gasket 322. The free lower margins of the door 25 are outwardly flanged as at 328 and adapted, when the door is closed, to engage a gasket 330 at the lower margins of the side walls 30 and 32 of the housing frame 21. The door has a lower flange 332 which, together with the flanges 328, and when the door or shield 25 is fully open, engage the flanges 324 of the angle member 320 to stop the door at its fully open position. The lower flange 332 of the door 25 affords a closure for the opening 22 in the housing frame, to prevent passage of liquid therethrough, and has a handle 336 whereby the door may be easily swung to open and closed positions. When the door 25 is in open position, the operator can pass his hands into the housing frame 21 and manipulate the drum-mechanism mechanism, shown in detail in Figs. 2 and 8 and above described, to lock the drum 64 to and release it from the stub shafts 40, and when the door is open, the dolly 162 can be passed into the frame and the drum 64 can be removed. It will be noted that clearance as shown at 338 is afforded between the flanges 312 and the housing hood 28 and side walls 30 and 32.

The door or shield 25 is telescopically arranged relative to and within the door 25, and likewise is imperforate and in the form substantially of a sector of a cylinder, with a cylindrical periphery 348, and plate-like sides 342 welded or otherwise secured to circular hubs 344, each such hub having side bearing engagement with the inner face of the associated hub 310 and surrounding and having rotary bearing engagement with and supported by the plenum 256. The free margins of the door 25 are flanged outwardly as at 346 and 348. An angle member 350 is welded or otherwise secured to the interior faces of the rear wall 59 and side walls 30 and 32 of the housing frame 21, and a sponge rubber or other suitable gasket 352 secured to the top of the angle member for engagement by the flange 348 of the door 25. A gasket 354 is attached to the flange 348 and projects laterally therefrom for wiping engagement with the peripheral wall 306 and side walls 308 of the door 25.

A rope or chain 350 which may extend from overhead pulleys (not shown) engages pulleys 362 and 366 and through the pulley 340 of the door 25 and through the rear wall 59 of the housing frame 21 and is anchored to the door 25 as at 366, for rotating said door to open position, the gasket 354 of said door being engageable with the gasket 352 on the angle member 350 at the limiting open position of said door.

The doors 25 and 26 are both used when the multiple suds (i.e., conventional) methods of washing and cleaning are used, in which event the door 25 functions as a reservoir, which is emptied when the door 26 is opened. When the method of my invention, described presently, is used, the door 25 may be pulled to fully open position or may be dispensed with entirely. In the latter case there will of course be no rope or chain hole in the rear wall 59 of the housing frame 21.

In accordance with the soil elimination of other fabric treating method of my invention, I bring the rotation of the drum 64 very rapidly to a very high speed—say about 600 R. P. M. to about 900 R. P. M.—and run it at this speed for several minutes, more or less, the first part of this period with the liquid turned on and the latter part with the liquid shut off. The period may vary with the quantity of fabrics treated and the kind of treatment given, among other factors. The high speed rotation generates tremendous centrifugal force, which causes the washing, cleaning, or other treating liquid through the fabrics with such speed and force as to loosen the soil and carry the same out with the liquid, such liquid being immediately discharged and not re-used.

The liquid and soil pass down through a drain hole 368 in the housing 20, leading to a drain (not shown). Thus only soil-free liquid is used. When the liquid is shut off, the continuing centrifugal force causes the moisture in the fabrics to be very rapidly and effectively extracted to the extent suitable for pressing. The drum is then slowed down very rapidly to a speed of say 15 R. P. M. to 20 R. P. M. for a few minutes, more or less, to loosen or fluff the fabrics. The complete cycle of operations, consisting of loading the drum, washing, cleaning or other treatment, loosening or fluffing, removal of the drum, discharge of treated fabrics therefrom, and re-mounting the drum in the housing are performed in a matter of about one-half hour for a load of about 350 lbs. of fabrics, whereas, with conventional machines and methods, the correspondingly cycle consumes about 2½ hours. Moreover, with my machine and method, the complete operations of fabric treatment, moisture extraction and loosening or fluffing are performed in what is essentially a single operation, which takes but a relatively short time, on the order of about 10 minutes to about 20 minutes to complete, whereas, with conventional machines and methods, the results are obtained only by a plurality of different operations, consuming a relatively very long period of time.

The machine may of course be made in any suitable sizes. For commercial laundry purposes, it may be found suitable to use a drum having an axial length of about 20" and a diameter of about 44". For domestic use a drum having diameters of about 18" to about 24" may be suitable.

In using my machine and method, the amount of machinery, space, power, time, personnel and treating materials necessary are small fractions of those required at present for obtaining corresponding results, a separate wringer or extractor being used in conventional practice. The high centrifugal force obtained in accordance with my invention, coupled with the continuous use of fresh treating liquid, enables the treatment to be carried out much more expeditiously than has heretofore been thought possible. When the purpose in view is the removal of the outermost skin of soil of the character conventionally requiring soap and water, this purpose, carried out in accordance with my invention, can be accomplished substantially without the use of soap, or with
relatively smaller proportions thereof, since the water alone loosens the soil and the high centrifugal force enables the water to carry off the soil. Likewise, where naphtha and sudsing material together have been heretofore required for grease removal, in accordance with my invention the naphtha alone or with a relatively smaller proportion of sudsing material may be employed to obtain comparable results.

Various modifications coming within the spirit of my invention may suggest themselves to those skilled in the art, and hence I do not wish to be limited to the specific form shown or uses mentioned, except to the extent indicated in the appended claims.

I claim:

1. A machine for removing foreign matter from fabrics, comprising a housing having a door, a drum disposed in said housing, means for rotating said drum, said drum having a door adapted to be opened to admit and permit removal of fabrics, said drum having openings in the end and peripheral walls thereof, said openings being sufficiently small to preclude bulging of the fabrics therethrough, said openings in said end walls being circumferentially elongated and closely spaced, and means for supplying and directing continuous sprays of foreign matter-loosening liquid through said elongated openings into said drum and against the fabrics therein, whereby said liquid will be continuously driven by centrifugal force radially through the fabrics and will escape with the loosened foreign matter through said openings in said peripheral wall, said housing having an opening for continuously draining the spent liquid and foreign matter entrained therein.

2. A machine for removing foreign matter from fabrics, comprising a housing having a door, a drum disposed in said housing, means for rotating said drum, said drum having a door adapted to be opened to admit and permit removal of fabrics, said drum having openings in the end and peripheral walls thereof, said openings being sufficiently small to preclude bulging of the fabrics therethrough, said openings in said end walls being circumferentially elongated and closely spaced, means for supplying and directing continuous sprays of foreign matter-loosening liquid through said elongated openings into said drum and against the fabrics therein, whereby said liquid will be centrifugally driven radially through the fabrics and will escape with the loosened foreign matter through said openings in said peripheral wall, said housing having an opening for draining the spent liquid and foreign matter entrained therein.

3. In combination with a laundry machine housing having a door and an open bottom, a rotatable drum mounted with its axis horizontal in said housing, said drum having in the end walls thereof substantially continuously circular intake ports coaxial with said drum, each port comprising a circular series of closely adjacent elongated arcuate openings, end wall reinforcing means separating adjacent arcuate openings, means for introducing fabric-treating streams substantially continuously through said ports into contact with fabrics in said drum, the peripheral wall of said drum being perforated for the centrifugal escape of spent liquid, the bottom opening of said housing providing for drainage of the escaping liquid.

MAX HIRSCH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>327,214</td>
<td>Wilson</td>
<td>Sept. 29, 1885</td>
</tr>
<tr>
<td>450,675</td>
<td>Montfort</td>
<td>Apr. 21, 1891</td>
</tr>
<tr>
<td>906,816</td>
<td>Nicolson</td>
<td>Dec. 15, 1908</td>
</tr>
<tr>
<td>1,271,549</td>
<td>Dudley</td>
<td>July 9, 1918</td>
</tr>
<tr>
<td>1,631,266</td>
<td>Hashal</td>
<td>June 7, 1927</td>
</tr>
<tr>
<td>1,775,879</td>
<td>White</td>
<td>Sept. 16, 1930</td>
</tr>
<tr>
<td>1,827,209</td>
<td>Robbins</td>
<td>Oct. 13, 1931</td>
</tr>
<tr>
<td>1,949,719</td>
<td>Jackson</td>
<td>Mar. 6, 1934</td>
</tr>
<tr>
<td>1,968,679</td>
<td>Gerlach</td>
<td>July 31, 1934</td>
</tr>
<tr>
<td>2,112,225</td>
<td>Balzer</td>
<td>Mar. 29, 1938</td>
</tr>
<tr>
<td>2,334,320</td>
<td>Evans</td>
<td>Nov. 16, 1943</td>
</tr>
<tr>
<td>2,334,982</td>
<td>Dyer</td>
<td>Mar. 28, 1944</td>
</tr>
</tbody>
</table>