June 1, 1943. M. TROY 2,320,488

LAUNDRY MACHINERY

Filed June 17, 1941 2 Sheets-Sheet 1

Fig. 1.

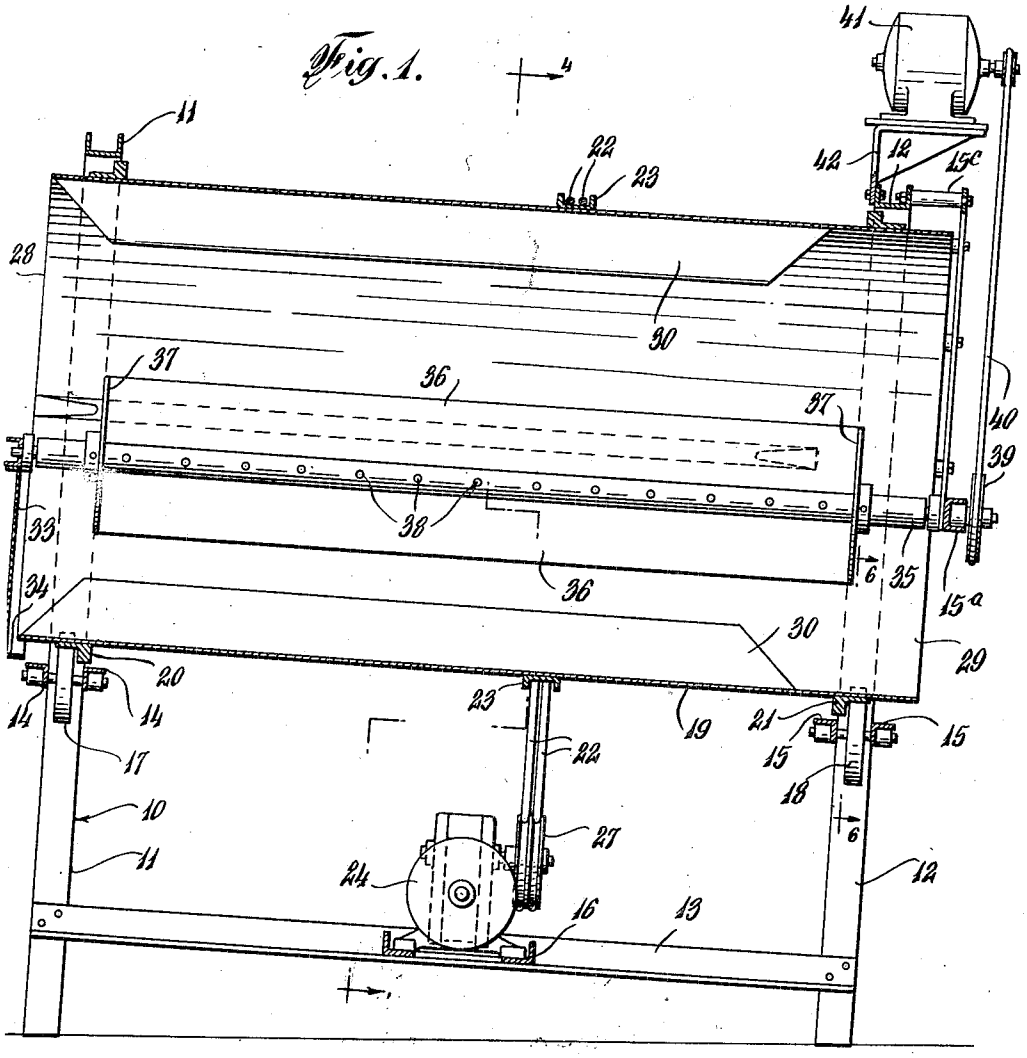


Fig. 2.

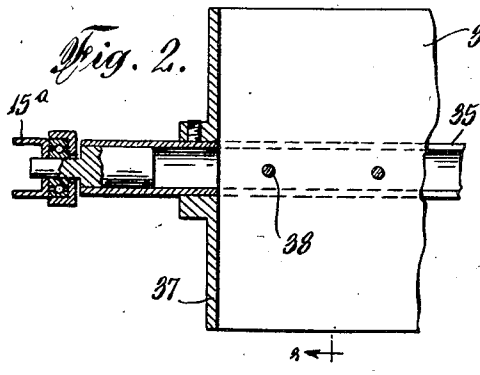
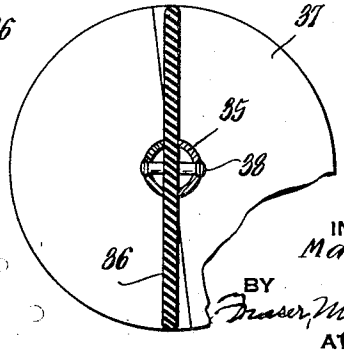


Fig. 3.



INVENTOR
Max Troy
BY
Fraser, Myers & Manley.
ATTORNEY

June 1, 1943. M. TROY 2,320,488

LAUNDRY MACHINERY

Filed June 17, 1941 2 Sheets-Sheet 2

Fig. 4.

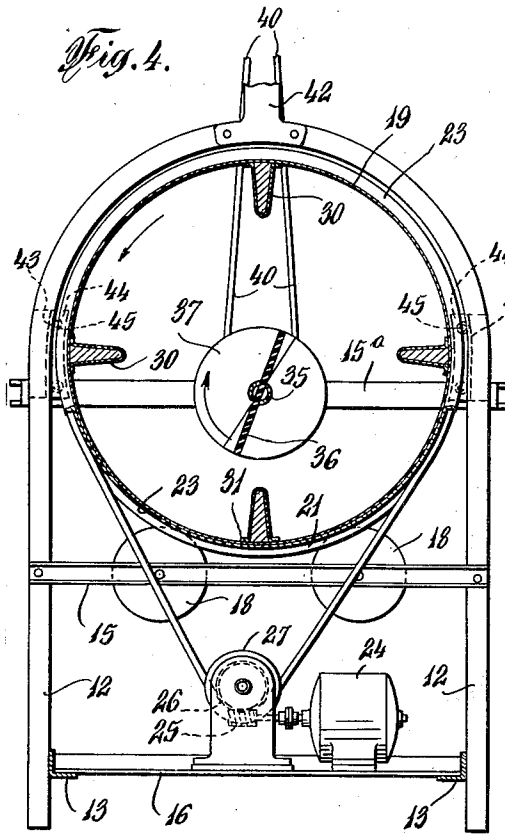


Fig. 5.

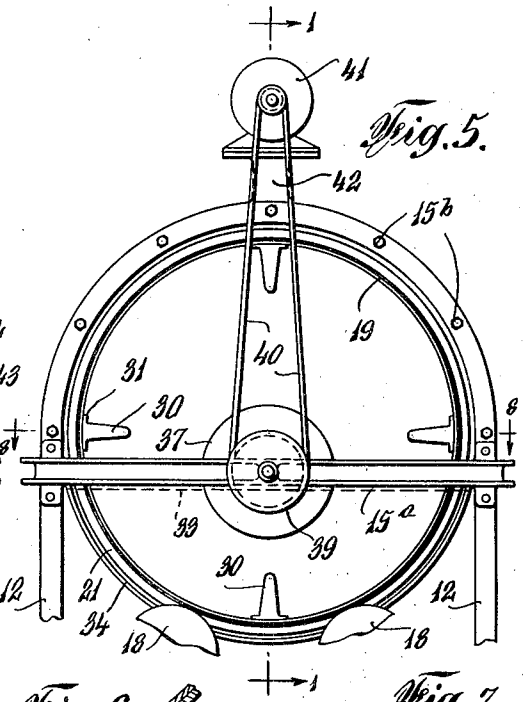


Fig. 6.

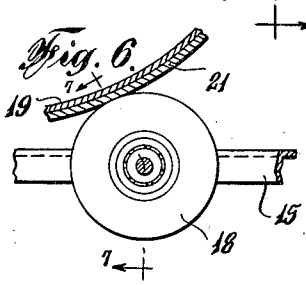
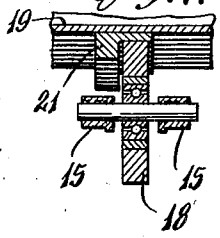


Fig. 7.



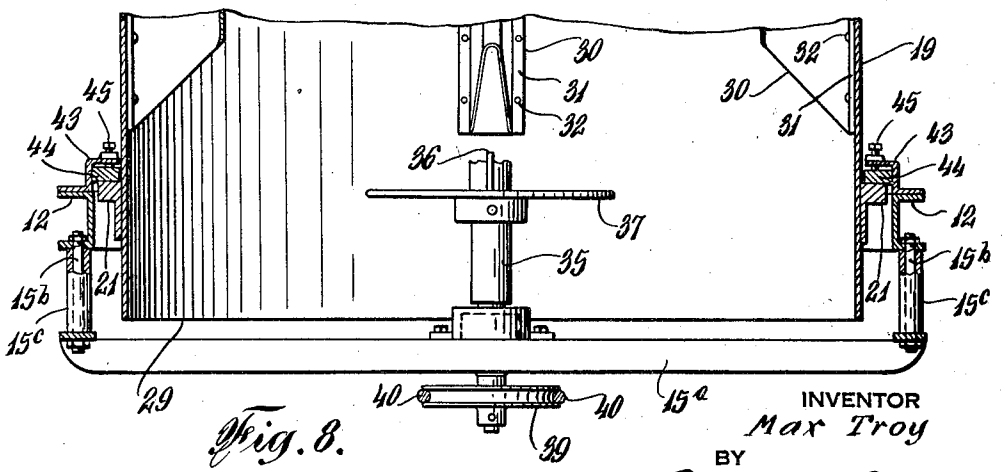


Fig. 8.

INVENTOR
Max Troy
BY
Fraser, Myers & Manley.
ATTORNEY

Patented June 1, 1943 2,320,488

UNITED STATES PATENT OFFICE

2,320,488

LAUNDRY MACHINERY

Max Troy, New York, N. Y.

Application June 17, 1941, Serial No. 398,389

6 Claims. (Cl. 38—143)

My present invention relates to laundry machinery and aims to provide certain improvements therein. More particularly it relates to a machine and method for conditioning articles to be laundered, either prior to being placed in a washing machine, or which have come from the washing machine preparatory for presentation to the ironer.

In industrial laundry practice and particularly in the laundering of flat work, the articles after being washed, are centrifuged or extracted to remove the excess moisture therefrom. The washing and extracting action causes the articles to become bunched and balled, in view of which condition considerable hand labor and time are required by operatives in removing the major folds from the articles prior to presenting them to the ironer or mangle. To overcome this hand labor, tumbling of the laundered articles in large drums provided with baffles has been resorted to. Although this practice does remove a large percentage of the major folds in the articles it leaves them in a condition which still necessitates considerable hand labor, especially in straightening out the ends of flat work such as towels, napkins, handkerchiefs, etc.

Another problem confronting industrial laundries is that of removing hair from towels which have been used in barber shops and beauty parlors. This is necessary since many laundries do not segregate their towels which are supplied to doctors, dentists, beauty parlors, barbers, etc., and it is essential that these towels be aseptically clean after laundering. In an endeavor to solve this problem, such towels have been heretofore subjected to a tumbling operation to free the hair therefrom prior to laundering, and while said practice has been fairly satisfactory, it has been far from perfection.

My present invention has for its primary object the provision of means and a method for removing the folds from balled or bunched laundry, notably flat work, so that the manual labor required for straightening out the flat work incident to its presentation to the flat work ironers is practically entirely eliminated. A further object of my invention is to so treat the flat work that lint, hair or other foreign matter which may be attached to the flat work and not removed therefrom during the washing and extracting operation will be dislodged from said flat work between the extracting and ironing operations. A further object is to provide a machine which will efficiently remove hair from towels prior to their being subjected to the laundering processes. A still further object is to accomplish the aforementioned objects in a simple and expeditious manner.

The foregoing and other objects of my invention not specifically enumerated I accomplish by presenting the extracted washed laundry which is in a balled or bunched condition and the hair coated towels to an especially designed tumbler and beater consisting essentially of a huge drum having inwardly-directed, radially-extending ribs, within which drum is mounted independently thereof, a shaft having radially-extending vanes or blades, the drum and shaft being rotatable in opposite directions at different speeds with the rate of rotation of the shaft having the vanes thereon being many times faster than that of the drum. The drum and the shaft of the machine are mounted to slope downwardly with respect to the horizontal, from the charging to the discharging end, said mounting being conducive to provide a natural movement through the machine of the laundry being treated and of also setting up a current of air moving toward the charging end for the purpose of carrying the lint, hair and other foreign matter which is detached from the laundry by the beating and tumbling action, toward and through the charging end of the drum where it may be collected.

The invention will be better understood from the detailed description which follows when considered in connection with the accompanying drawings showing a preferred embodiment of my invention, and wherein:

Figure 1 is a vertical axial section through a machine embodying my invention, said section being taken substantially along the plane of the line 1—1 of Fig. 5.

Fig. 2 is an axial section through one end of the vaned shaft mounted for rotation within the drum.

Fig. 3 is a section taken substantially along the plane of the line 3—3 of Fig. 2.

Fig. 4 is a section taken substantially along the plane of the line 4—4 of Fig. 1 and showing the driving connection for the drum.

Fig. 5 is a fractional end view of the machine shown in Fig. 1 as viewed from the right hand end thereof and showing the driving connection for the vaned shaft.

Fig. 6 is a section taken substantially along the plane of the line 6—6 of Fig. 1.

Fig. 7 is a section taken substantially along the plane of the broken line 7—7 of Fig. 6.

Fig. 8 is a horizontal section through one end of the machine taken substantially along the plane of the line 8—8 of Fig. 5.

Referring now to the drawings in the several figures of which the same reference characters are employed to designate corresponding parts, the numeral 10 indicates a skeleton frame for supporting the various parts of the machine, said frame consisting essentially of upright end members 11 and 12, longitudinal connecting members 13 and transverse bracing members 14 and 15, and transverse supporting members 16. Additional transverse bracing and supporting members 15a are connected to the end members 11 and 12 through connecting bolts 15b and spacing sleeves 15c. These various members may be suitably formed from angle or channel iron stock or equivalent material. Upon referring to Fig. 1 it will be noted that the upright end members 11 and 12 are not truly vertical but incline from the vertical several degrees, and that the longitudinal connecting members 13 likewise are not truly horizontal but incline from the horizontal by several degrees. The reason for this inclined mounting of the framework is that the machine as a whole is inclined with respect to the horizontal for a purpose which will presently appear.

Carried by each pair of transverse bracing members 14 and 15 are a pair of spaced rollers 17 and 18, respectively, which rollers function to support a rotatable drum 19 upon annular tracks 20 and 21, respectively carried by the drum adjacent the ends thereof. For rotating the drum upon the supporting rolls 17 and 18 I provide a pair of driving belts 22 trained over a channel 23 mounted on the drum, the belts being driven from an electric motor or the like 24 through reducing gears 25, 26, and pulley 27.

The rotatable drum 19 is open at its opposite ends, the end 28 having the higher elevation being the charging end, and the end 29 having the lower elevation being the discharging end. Suitable means (not shown) may be provided for continuously or intermittently charging laundry into the end 28 and for receiving the discharged laundry from the end 29. The drum 19 on its inner surface is provided with a plurality of circumferentially spaced radial inwardly-extending longitudinal ribs 30, here shown as four in number, the said ribs extending from the charging end to a point inwardly from the discharging end, and the ends of the respective ribs being chamfered inwardly from said ends. The ribs 30 may be formed of any desired material and may be secured to the drum in any preferred manner. As herein shown, said ribs are of wedgelike form in cross-section; are of a depth equal to about one-eighth the diameter of the drum and are secured to the inner surface of the drum by flanges 31 and securing means 32, as best shown in Fig 8. Supported by the transverse bracing and supporting member 15a at the charging end of the drum and in spaced relation to the end of said drum is a substantially semi-circular plate 33 which serves as a partial closure for substantially the lower half of said end of the drum, the edges of said plate 33 being turned inwardly to provide a flange 34 disposed in spaced overlying relation to the end of the drum, for a purpose which will presently appear.

Rotatably supported in bearings carried by the transverse bracing and supporting members 15a so as to extend through the drum 19 below and parallel to the axis thereof is a shaft 35 upon which is mounted a pair of diametrically opposed vanes or blades 36 between a pair of collars 37 on said shaft. These vanes are preferably semi-rigid, that is—yieldable but relatively stiff, being formed of rubber, canvas or any other suitable material. If desired, the opposite ends of the vanes may be angularly offset somewhat with respect to each other so as to give to said vanes a slightly twisted contour. The vanes when rotated at a high rate of speed will function to set up a current of air within the drum which will move from the discharge end toward the charging end thereof. The vanes 36 may be integrally formed and secured to the shaft 35 in any preferred manner, for example, by having the shaft longitudinally split and the parts embracing the vanes and held together by rivets 38. The shaft 35 is rotatable independently of the drum 19 and preferably in a direction of rotation opposite to that of the drum. Such rotation may be imparted to the shaft by any suitable means, for example, through a pulley 39 mounted at the lower end of the shaft and over which is trained a belt 40 adapted to be driven by a motor 41 which may be suitably supported on a bracket 42 mounted at the top of the end member 12.

Because of the inclination of the drum 19 and the load which it is obliged to carry and the manner in which it is supported on the rollers 17 and 18, it is desirable to resist the lateral thrust due to said load acting upon said rollers. For this purpose there is mounted between Z-bars 43 carried by the upright end members 11 and 12 at approximately the opposite ends of the horizontal diameter of the drum and the annular tracks 20 and 21 thereon, wooden or fibre thrust blocks 44, said blocks being adjustable toward the track by bolts 45.

In the operation of my laundry machine as hereinbefore described, the vaned shaft 35, 36 is rotated by the motor 41 at a speed of about fifteen times that of the drum 19 and in a direction opposite to that of the latter, as indicated by the arrows in Fig. 4. The drum 19 it will be appreciated, will be independently rotated by the motor 24 through the reducing gearing and belt drive 22. The laundry articles to be conditioned, preferably bunched or balled flat work which has come from the extractor, or hair-bearing towels, are either continuously or intermittently charged into the end 28 of the drum. The rapid rotation of the vanes 36 violently throws the articles outwardly toward the drum, wherein they are elevated by the ribs 30 to a point above the axis of the drum from which they are again dropped onto the rotating vanes and once more violently thrown outwardly against the drum. This combined tumbling and beating action upon the articles operates to unball and remove the folds and major wrinkles from the articles. Said action also operates to free any lint, hair or other foreign matter from the articles while the rapidly rotating vanes set up a current of air which will, due to the disposition of the vanes, move toward the charging end of the drum and operate to carry such lint, hair and the like toward said end where said foreign matter is either blown out of the open end of the drum, or, if it strikes the plate 33, will settle down between said plate and the end of the drum and be caught upon the flange 34 from which it may be periodically removed. Because of the inclination of the drum the fed goods during the beating and tumbling operation will progressively move toward the discharging end of the drum whereat it may be received upon a suitable conveyor or in

receptacles for further treatment, such as presentation to the ironers or mangles for laundered articles, or to the washers if the articles are unlaundered treated hair-bearing towels.

As a practical proposition the operation of the machine may be controlled through switches by an operator at the discharge end of the machine whereat the mangles or ironers will be located, so that the rate of discharge may be controlled to the speed at which the operators can feed the conditioned goods to the ironers or mangles.

Although I have shown and described a preferred embodiment of my invention and the manner in which the same may be constructed and used, it is to be understood that I do not wish to be limited to the precise details of construction or manner of operation since these may be varied within the range of engineering and mechanical skill without departing from the spirit of the invention as defined in the following claims.

What I claim is:

1. A laundry machine comprising a peripherally imperforate drum open at both ends and mounted for rotation upon an axis sloping downwardly from the horizontal, the higher end of the drum being the charging end and the lower end being the discharging end, said drum having a plurality of circumferentially spaced, inwardly-extending longitudinal ribs, a shaft extending through the drum and having extending from the surface thereof a longitudinally-extending vane and means for rotating the drum and the vane in opposite directions and for rotating the vane at a much higher rate of speed than the drum.

2. A laundry machine comprising a drum open at both ends and mounted for rotation upon an axis sloping downwardly from the horizontal, the higher end of the drum being the charging end and the lower end being the discharging end, said drum having a plurality of circumferentially spaced, inwardly-extending longitudinal radial ribs of a length approximately equal to the length of the drum, a shaft extending through the drum and having extending from the surface thereof a pair of diametrically opposed, longitudinally-extending vanes of a length approximately equal to the length of the drum, and means for rotating the drum and the vanes in opposite directions and for rotating the vanes at a much higher rate of speed than the drum.

3. A laundry machine according to claim 2 wherein the ribs are rigid and the vanes are yieldable but relatively stiff.

4. The method of conditioning laundry goods between extracting and ironing which comprises causing said goods to move from the charging to the discharging end of a drum while subjecting said goods to a tumbling and beating action to shake out the major folds and free said goods from lint, hair and other foreign matter and creating in said drum a current of air moving in a direction opposite to that of the goods sufficient to cause said lint, hair and foreign matter to be discharged at the charging end of the drum.

5. The method of freeing hair from towels or the like which comprises causing said towels to move from the charging to the discharging end of a drum while subjecting said towels to a tumbling and beating action and creating in said drum a current of air moving in a direction opposite to that of the towels sufficient to cause the detached hair to be discharged at the charging end of the drum.

6. A laundry machine according to claim 2, wherein the vanes on the shaft are disposed to generate an air current moving toward the charging end of the drum.

MAX TROY.