J. McGOWAN, JR.

CAN WASHING MACHINE.

APPLICATION FILED OCT. 23, 1918.

1,411,288. Patented Apr. 4, 1922.

Fig. 1.

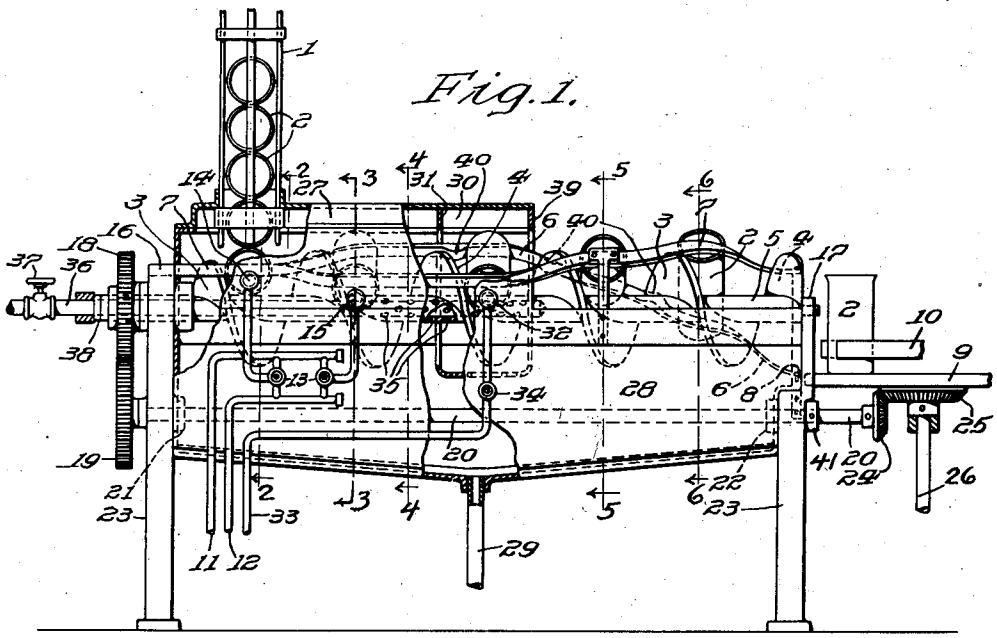


Fig. 3.

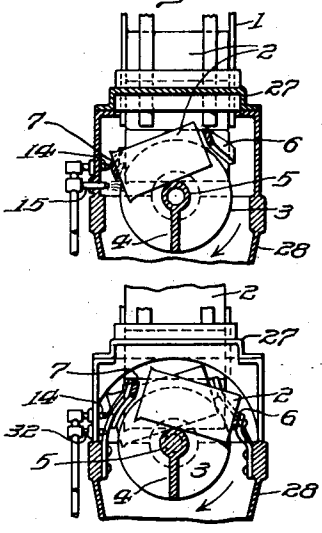
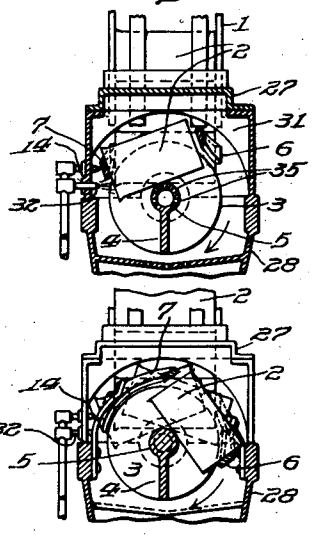


Fig. 4.



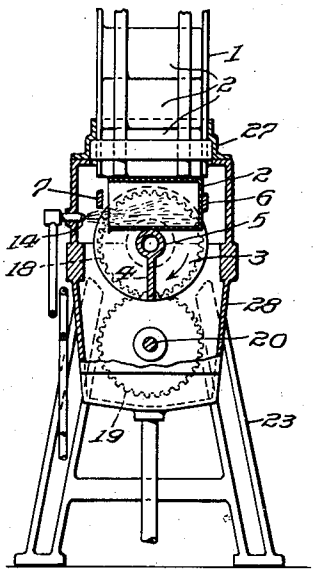


Fig. 2.

Fig. 5.

Fig. 6.

INVENTOR

James McGowan Jr.

WITNESS

F. J. Hartman.

BY

Fraser & Blount

ATTORNEYS

UNITED STATES PATENT OFFICE.

JAMES McGOWAN, JR., OF CAMDEN, NEW JERSEY, ASSIGNOR TO JOSEPH CAMPBELL COMPANY, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CAN-WASHING MACHINE.

1,411,288. Specification of Letters Patent. Patented Apr. 4, 1922.

Application filed October 23, 1918. Serial No. 259,331.

To all whom it may concern:

Be it known that I, JAMES McGOWAN, Jr., a citizen of the United States, residing in the city of Camden, county of Camden, and State of New Jersey, have invented certain new and useful Improvements in Can-Washing Machines, of which the following is a specification.

This invention relates to a can washing machine which is designed to operate upon the cans preferably in transit from a supply station to a filling machine or other similar destination. Such washing machine, however, may be used separate and distinct from the means for delivering the cans to the washing machine as well as to the can filling machine, but for the purpose of illustration, it is preferably interposed in the path of the can from the can supply station to one or more of the can filling machines above referred to.

Generally the cans, in manufacture, are handled by machinery, and in spite of whatever precautions that may be taken a certain amount of foreign matter of any kind including dirt, solder, etc., is bound to find its way into the cans. Dust and moisture are also frequently deposited in the form of a film upon the cans. Such foreign substances and coatings may be readily removed by the present invention, as hereinafter more fully shown.

As a cleaning fluid, I prefer to use steam and water, but any other cleansing fluid that may have the property of a sterilizing or disinfecting or cleaning fluid may be used fully as well. In the present invention such cleaning or sterilizing agent may be introduced within each can or upon the outer surface thereof and may then be removed together with the foreign matter, as the can progresses through the washing machine.

One of the objects of my invention, therefore, is, firstly, to remove such foreign matter either forcibly by means of a strong jet of fluid or to dissolve and remove the same by such fluid, and, in some cases, to sterilize the cans, secondly, to remove such fluid together with all foreign substances and, thirdly, to dry said cans, preferably, while said cans are in transit through the washing machine. Where a sterilizing fluid is used the heating of the cans thereby is an advantage when it is desired to apply the contents therein while hot, no heat being thus lost by such contents coming in contact with the cans. At such time, I prefer, in addition to injecting such fluids within the cans, to also shift them about, that is to say, to shake or "rumble" them so as to aid in dislodging the particles of foreign matter adhering to the cans. It is also preferably intended to rotate the cans at the same time that these are vibrated and shaken so that the fluid may move about the interior surface of the can during the cleaning operation. Such means also comprehend the idea of emptying the cans at a point.

In the drawings accompanying this specification and relating thereto,

Fig. 1 is a side elevation, partially shown in longitudinal section;

Fig. 2 is a section taken upon the line 2—2 of Fig. 1 showing the position of the parts in the first stage of operation;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1 showing the position of the parts in the second stage of operation;

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1 showing the dumping stage of the cans;

Fig. 5 is a sectional view taken on the line 5—5 showing the can turned upwardly for the purpose of moving into an upright position and,

Fig. 6 is a sectional view taken on the line 6—6 showing a latter stage of operation where the can is about to leave the washing machine.

The embodiment chosen to illustrate my invention comprises a can chute 1 from which the can 2 may be delivered by gravity in a more or less steady flow. The lower end of the can chute terminates just above a worm or screw 3, the convolutions of which are spaced apart or have such a pitch as to provide a space between the succeeding worm surfaces which shall be slightly greater than the diameter of the can. In such a space, between the worm surfaces 4, the lowest can in the chute may rest until it is moved horizontally forward by the worm after which the next above or succeeding can takes its place. The worm 3 is formed with a relatively thin blade, of helical form, which has but very little increase of thickness at the bottom thereof next to the shaft 5 upon and around which the blade 3 of the worm may be formed.

The diameter of the shaft 5 is such that the

cans resting thereupon at right angles to the shaft, have but little contact with said shaft. As the shaft 5 and the worm 3 are rotated right-handed, as viewed from the exit end of the machine, that is, referring to Fig. 1 of the drawings, the worm turns from the front to the back, the cans are immediately thrown to the back of said figure or to the right as viewed from said end, where there is positioned a strap or guide 6 of such width as to contact with the bottom or closed end of the can and along which the bottom of the can slides, being thrown thereagainst by the frictional contact of the cans with the screw flanges 4, and at the same time being carried to the right by the rotation of said screw. The strap 6 may have protuberances on its surface so as to agitate the can as it is passed therealong.

The can 2 is substantially horizontal as it moves through and out of the chute 1, it being initially held horizontally by said screw; but immediately thereafter, the action of the worm 3 acts to throw the can against the strap 6. The position of the can is thereafter determined by the contour of the straps 6 and 7 against one or the other of which the can may be guided. The straps 6 and 7 may be shaped so as to maintain the axis of the can at any angle with regard to the horizontal plane passing through the axis of the shaft 5.

As shown in the drawings, particularly Fig. 3, the can 2 may be guided into a position where the closed end of the can is higher than the open end, and in this position the cleaning fluid is forcibly thrown against the bottom and side walls of the can. The can 2, however, may be tilted otherwise as is found desirable, and, accordingly, the contour of the straps 6 and 7 may be varied to conform therewith.

From the position shown in Fig. 3, the can is gradually advanced by the worm, as guided by the curved surface of the strap 6, to the position shown in Fig. 4, where the closed end of the can is also higher than the open end thereof and in the position where the cleaning fluid, and the foreign substances removed thereby, may be turned out of the can, the strap 7 preventing the can from falling forwardly out of the machine at this point.

Strap 7 is formed and attached so that it shall then guide the can backwardly as considered in connection with Fig. 1. The lowest point 8 of the guide bar 6 is at the discharge end of the conveyor or worm 3, and here the side of said guide bar which is adjacent the can is substantially horizontal and on the level of the top of the table 9 of the can filling machine. The other guide bar 7, at this point, is substantially vertically positioned over the end 8 of the guide bar 6. As, therefore, the can reaches this point in its travel through the washing machine it is in a substantially vertical position resting on its bottom, and passes directly on to the rotating table 9 of the can filling machine, and into engagement with the recessed arm 10 thereof. As shown in Fig. 1, the can 2 is ejected from the cleaner almost as soon as it becomes vertical yet this is not essential.

Pipes 11 and 12 are intended to convey cleansing or washing fluids. Pipe 11, may, preferably, convey steam or hot water, while pipe 12 may convey water, hot or cold, intended to remove whatever matter may be found within the can in the last phase of the washing operation. Both pipes, however, may be used interchangeably for any fluid that may be chosen for use at the time and, therefore, I do not limit myself to the use of any particular fluid for any of said pipes.

At 13 are interposed between the pipes 11 and 12 two three-way valves of any suitable well known type whereby by appropriate positioning of these valves, any fluid such as steam or water may be used in either or both of the nozzles. Either or both of these valves may be intermittently moved by a suitable actuating device, not shown, if desired.

I may, however, also blow air under pressure through either or both of the nozzles 14 and 15 for the purpose of dislodging any dirt and foreign articles that may be present in the cans. Such air may be either hot or cold and may be delivered by the nozzles 14 or 15 or, preferably, by the nozzle 32 as may be desired or found necessary.

From the three-way valves 13, the fluid may pass to nozzles 14 and 15 positioned in the casing of the machine, so that the discharge therefrom shall pass into the adjacent open end of the can 2. Nozzles 14 and 15 and 32 may be of any suitable construction. Assuming the nozzle 14 delivers steam, it is apparent from Fig. 1 that the discharge will enter the can 2 as the latter is in a horizontal position, and that when said can has reached the position wherein it is tilted to the position shown in Fig. 3 the water from the nozzle 15 may enter or be injected into said can to contact with the inner surfaces thereof. The can may, however, be so positioned that the water may be directed to clean the exterior of the can 2 as well as the interior. While the discharges from the nozzles 14 and 15 have been shown at particular places, it may be observed that their position and number is not limited to that shown and that they may be arranged in any number and at any position desired.

After the cans 2 have passed by nozzles 14 and 15, they will commonly be wet and in some cases to such an extent as to be unsuited for filling. Also it may be desired to heat the cans as well as to dry them, and

I have provided a drying or heating chamber 30 for this purpose. The chamber 30 is formed by placing a partition 31 about the worm 3 and as close thereto as feasible so as to restrain the escape as much as possible, of the drying or heating agent. Hot dry air has been found to be a satisfactory agent to use in this chamber but I may use other means to effect the desired result.

As shown, I inject or introduce hot dry air into the chamber 30 by means of the nozzle 32. Any number of like nozzles may, however, be used for this purpose and the amount of flow therefrom may be controlled by a valve as in the case of nozzles 14 and 15. This nozzle 32 may be supplied from a pipe 33 in which may be located a suitable valve 34 for obvious purposes. I also introduce additional hot air into the chamber 30 by perforating the shaft 5 or the worm 3 and pass through the perforation 35 a suitable amount of hot air, a pipe 36, with a valve 37 therein, being a suitable means for doing this. A sliding joint 38 may be formed on the end of the pipe 36 and between it and the shaft 5.

While the can 2 is shown in a certain position in the drawings while passing through the chamber 30, I may even invert it completely or otherwise position it by simply changing the forms of the straps 6 and 7.

The partition 31 and the end 39 of the casing may be supplemented by the use of a curtain, not shown, of any suitable form to more completely retain the heating medium in said chamber.

By using the worm 3 to convey the cans, and by having the strap 6 at the rear thereof, I have found a method for rolling the cans due to the contact of the surfaces 4 of the worm with the cylindrical surface of the can 2, and consequently any fluid that may be injected within the can may sweep completely around the inner surfaces thereof as it is rotated. The extent of rolling may be varied at will by retaining the can upon the surfaces 4 at the proper angle and for a sufficient period before moving it to either the dumping position or to a nearly vertical position where the can slides off the surfaces 4 and out of the influence of said surfaces.

At the same time that the rotation of the can is effected, a considerable jarring or rumbling of the can is produced by reason of the contact of the projections 40 on the straps 6 and 7 with the ends of the can and the surfaces 4 of the worm with the cylindrical surface of the can, which rests very lightly upon the shaft 5 of the worm 3. The motion of the can along the strap 6 in contact with the surface of the worm, is, therefore, not a smooth one, and a continuous jarring or shaking of the cans is produced which serves to dislodge the foreign substances and also makes the water projected to the interior of the can all the more active in running about said inner surface. This shaking of the can will also be understood to assist in emptying the can at the designed position for said discharge. The protuberances may be regularly or irregularly spaced and may be of such a contour as will not cause the edge of the can 2 to catch thereon. There should be a distance, of at least, the diameter of the can therebetween to obtain good results. The straps 6 and 7 may be suitably attached to adjacent portions of the casing 28 or the frame of the machine, and are suitably spaced apart sufficiently to permit the can to move therebetween, that is, the distance between the surfaces thereof is greater than the length or height of the can.

The worm 3 upon its shaft 5 is mounted in bearings 16 and 17 and the shaft 5 extends through bearing 16 for sufficient distance so as to receive a gear 18 meshing with gear 19 therebelow mounted upon a shaft 20 which has bearings at 21 and 22. Said bearings 21 and 22 are positioned in an ordinary frame supported upon legs 23 fastened upon the floor; collar 41 on the shaft 20 near the bearing 22 avoiding longitudinal movement of said shaft. At the end of shaft 20, a beveled gear 24 receives power from the large beveled gear 25 which is suitably fastened to the table 9 of the can filling machine, said beveled gear and table 9 being mounted upon the shaft 26 suitably connected to a power driven member. Adjacent to the can chute 1 and extending forwardly over the period of travel of the cans wherein they receive fluid and discharge it, a casing 27 is fitted. This may be substantially tight, if wished, by the use of a curtain, not shown, or it may be left open at its outer end. This casing may be integrally formed with and located above another casing 28 which extends upon both sides of the washing machine and below which it forms a catch basin to receive the discharged water containing dirt and the like. A discharge pipe 29 serves to carry the waste water from the machine. Of course a screen may be positioned above the mouth of the discharge pipe.

Having thus described my invention, I claim and desire to protect by Letters Patent of the United States:—

1. In a can washing machine, the combination of a rotating conveyer for conveying cans therethrough, said conveyer comprising means for simultaneously rolling the cans about axes transverse to the axis of rotation of said conveyer, curved guiding means adapted to engage the cans at the ends thereof for inclining the cans at different inclinations to receive thereinto and pour therefrom cleansing fluids, and stationary fluid projecting means located adjacent the path of travel of the cans through the machine and

adapted to project different fluids into and upon the cans as the cans are moved past said fluid projecting means.

2. In a can washing machine, the combination of a rotating conveyer for conveying cans therethrough, said conveyer comprising means for simultaneously rolling the cans about axes transverse to the axis of rotation of said conveyer, curved guiding means adapted to engage the cans at the ends thereof for inclining the cans at different inclinations to receive thereinto and pour therefrom cleansing fluids, protuberances upon said guide means for displacing and permitting a return of the cans from and to the normal path of conveyance thereof between said guiding means for agitating the cans and the contents thereof, and stationary fluid projecting means located adjacent the path of travel of the cans through the machine and adapted to project different fluids into and upon the cans as the cans are moved past said fluid projecting means.

3. In a can washing machine, the combination of an upright can chute for feeding cans to said machine, a casing into which the cans are fed from said chute, a rotating conveyer for conveying the cans at a uniform rate of movement through said machine in a direction parallel to the axis of said rotating conveyer, said casing enclosing the cans and said conveyer for a part of the travel of the cans and the length of said conveyer, said casing preventing the external scattering of the cleansing fluids projected against and into the cans, means adapted to engage the ends of the cans to cause the cans to assume different inclinations during the conveyance thereof through said machine whereby the cans may receive thereinto and pour therefrom cleansing fluids, and stationary fluid projecting means located adjacent the path of travel of the cans for directing jets of different fluids in succession upon and into the cans while the latter are conveyed through and inclined in said machine.

4. In a can washing and drying machine, the combination of a rotating conveying means for conveying cans through said machine in a direction substantially parallel to the axis of said rotating conveyer, spaced stationary means for applying cleansing and drying fluids to the cans during the conveyance thereof through said machine, curved guiding means adapted to be engaged by the ends of the cans to cause the cans to assume different inclinations transverse to the axis of said rotating conveyer during said conveyance of the cans, spaced means on said guiding means for agitating the cans longitudinally of the axis thereof during said conveyance of the cans.

5. In a can washing machine, the combination of a rotating can conveyer comprising a helical blade and an integral axial tubular portion, the adjacent convolutions of said blade spaced to receive the cans therebetween with the axes thereof transverse to the axis of the rotating conveyer, said cans adapted to rest upon said tubular portion and in contact with said adjacent convolutions of said blade, spaced curved guiding members adapted to engage the ends of the cans for tilting the cans at different angles to receive therein and to pour therefrom cleansing fluids, said tubular portion provided with perforations for the supply of a drying fluid to the cans moved by said conveyer.

In witness whereof, I have hereunto set my hand this 18th day of October, A. D. 1918.

JAMES McGOWAN, JR.