

July 21, 1931.

G. CHRISTENSEN

1,815,239

CASE WASHING MACHINE

Filed Jan. 3, 1930

3 Sheets-Sheet 1

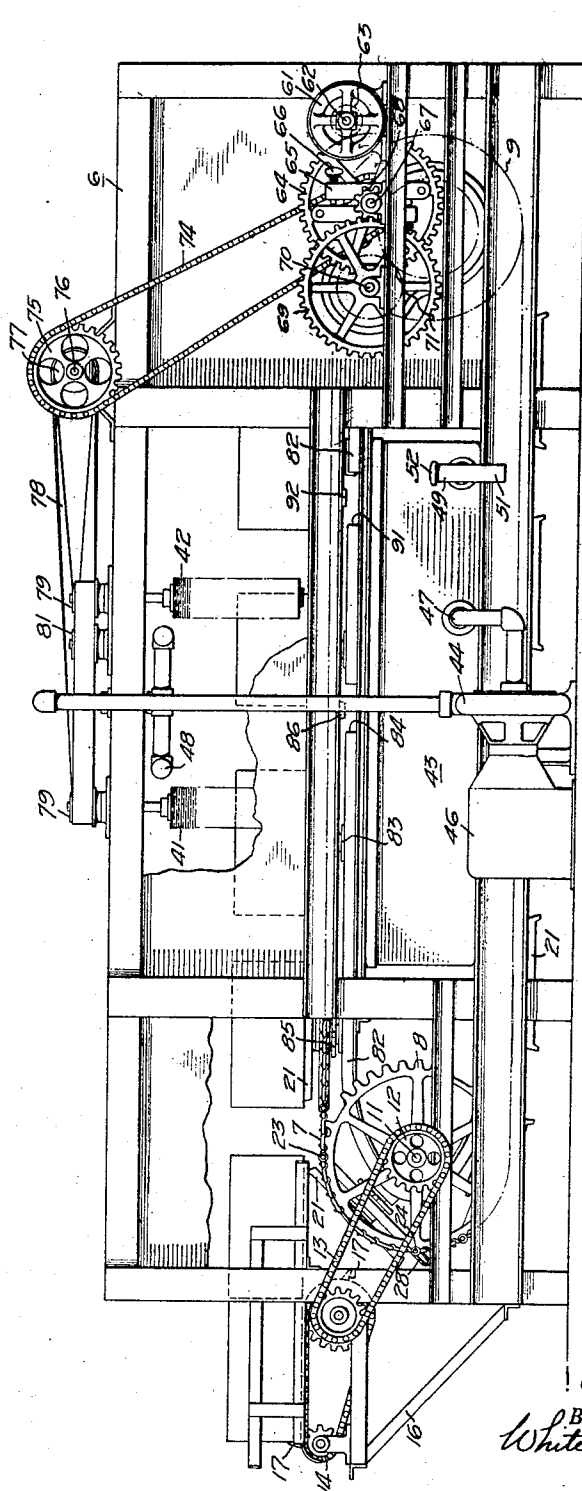


FIG. 1

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3 Sheets-Sheet 2

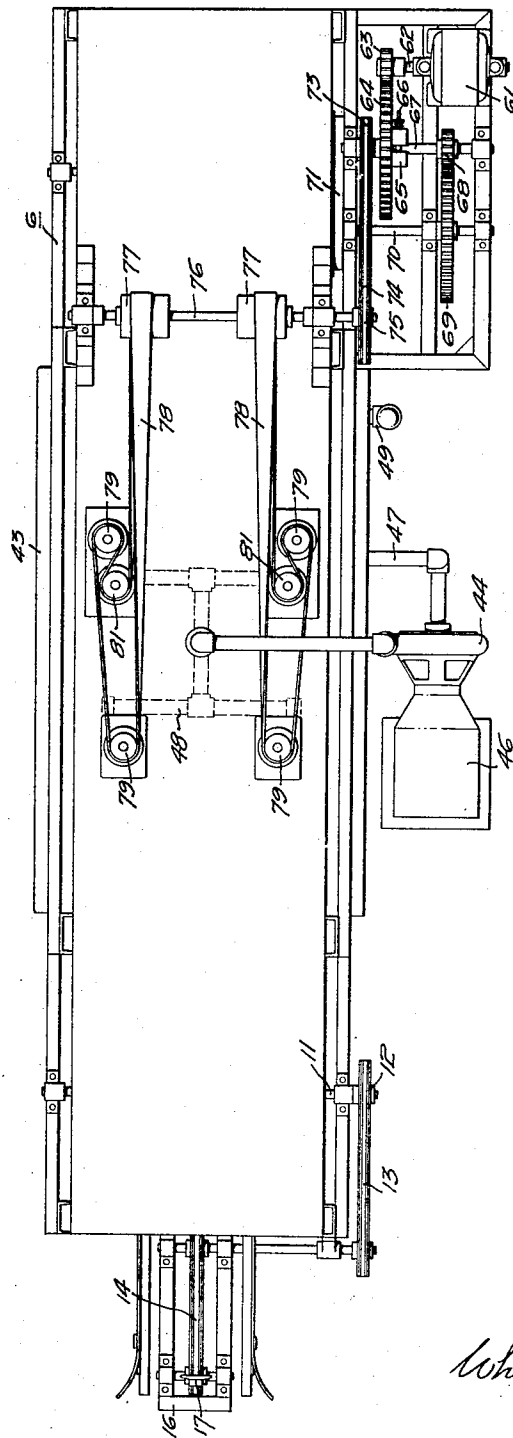


FIG. 2

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3 Sheets-Sheet 3

FIG. 3

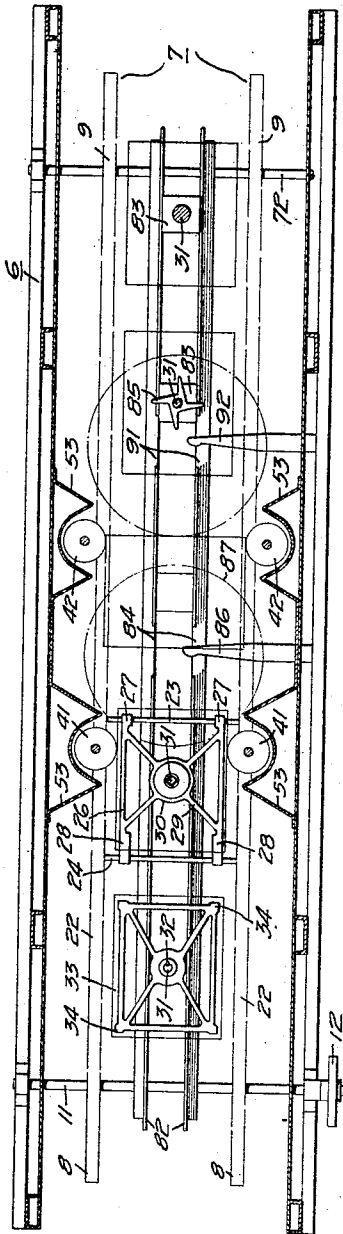


FIG. 4

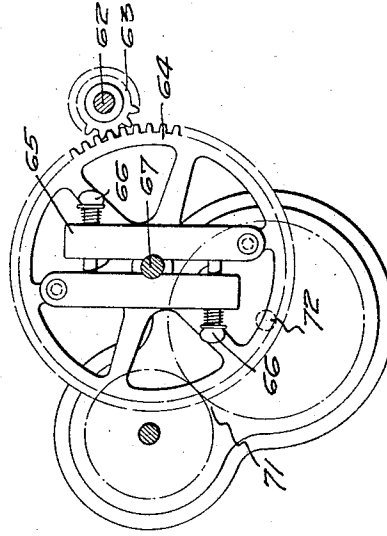
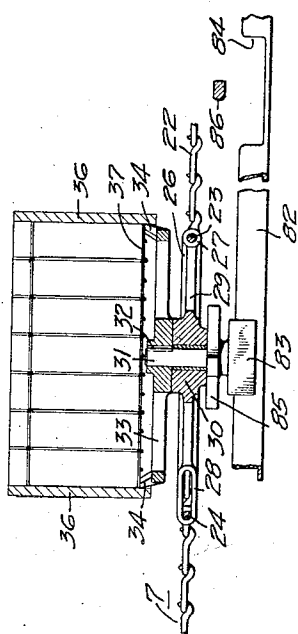


FIG. 5



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UNITED STATES PATENT OFFICE

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CASE WASHING MACHINE

Application filed January 3, 1930. Serial No. 418,243.

This invention relates to a machine for washing containers, particularly to the washing of cases used for containing milk bottles.

It is a broad object of my invention to devise a machine generally useful for the washing of cases, the machine handling the cases to be washed in a regular and efficient manner, thus obviating the necessity for substantially any hand labor.

The invention possesses other advantageous features, some of which with the foregoing will be set forth at length in the following description where I shall outline in full that form of case washing machine of my invention, which I have selected for illustration in the drawings accompanying and forming part of the present specification. In said drawings I have shown one form of case washing machine embodying my invention, but it is to be understood that I do not limit myself to such form since the invention, as set forth in the claims, may be embodied in a plurality of forms.

In the drawings:—

Figure 1 is a side elevation of a form of machine embodying my invention.

Figure 2 is a plan view of the machine shown in Figure 1.

Figure 3 is a view, partly as a section through the machine shown in Figure 2 and partly diagrammatic to illustrate the operations.

Figure 4 is a side elevation, partly in section, illustrating the means for handling the cases.

Figure 5 is a side elevation of a portion of the driving mechanism.

The cases used for the handling and transporting of milk bottles are subject to contact with milk to some extent and to attendant dirt and grime. With such an article as milk, the utmost cleanliness and appearance of cleanliness must be preserved. In accordance with my invention I have provided a machine useful for cleaning the cases in which the milk bottles are transported and handled. These cases usually comprise an oblong wooden box or casing within which are positioned several wire screens or nettings to support and to space the bottles apart. The netting used

for supporting the bottles is ordinarily positioned within the box at some little distance from the bottom.

In accordance with my invention I have devised a machine in which the boxes are subject to the action of a suitable cleansing solution and a suitable cleaning agent thoroughly to clean the boxes. Further, I have devised a machine in which the cases, ordinarily oblong in contour, are successfully handled while their several exterior surfaces are cleansed substantially without any hand operations from the beginning to the end of the cleansing.

In that embodiment of the machine of my invention which I have here chosen for disclosure, a framework indicated generally at 6 is assembled of such structural elements as channels and angles. The framework 6 is so constructed that it suitably supports a conveyor 7 which is adapted to travel in a predetermined path, being supported by pairs of rotatable sprockets 8 and 9. Sprockets 9 are adapted to be driven from a suitable source of power, as will presently be revealed, while sprockets 8 drive, through an intermediary shaft 11 upon which they are positioned, a sprocket 12 carrying a chain 13. The chain 13 extends to and drives a second conveyor 14 positioned upon an auxiliary framework 16. The relationship between the two conveyors is such that cases delivered to the auxiliary conveyor 16 are engaged by lugs 17 thereon and are, as the auxiliary conveyor traverses its path, delivered to conveyor 7 and are received thereon by case receiving means indicated generally at 21.

The conveyor 7 comprises a pair of spaced chains 22 which are receivable by the two pairs of sprockets 8 and 9. The case receiving means 21 are conveniently positioned by extending bars 23 and 24 between the chains. A framework 26 is formed with alined eyes 27 to receive bar 23 and with alined elongated eyes 28 to receive bar 24 so that relative movement may occur between the framework and the bar 24. This construction accommodates the case receiving means to passage about the periphery of the sprocket as is particularly shown in Figure 1.

The framework is conveniently a casting having arms 29 extending inwardly to a central portion 30 adapted to pass a shaft 31. Joined to the shaft by a key 32 is a case supporting framework 33 provided with projections 34 to engage sides and ends 36 and bottom netting 37 of a case.

Upon a case being discharged from auxiliary conveyor 14 to the main conveyor and being received upon the case engaging means, the case is transported by the conveyor 7. To accomplish the cleaning of the cases, in accordance with my invention, I have provided means for cleaning the cases as they are transported by the main conveyor. This conveniently comprises suitable friction scrubbing means as provided by sets 41 and 42 of brushes. These are rotatably mounted on opposite sides and adjacent to the conveyor so that they contact opposite sides of cases on the conveyor. A cleaning solution, usually soap and water, is supplied from a tank 43. This tank is positioned beneath the conveyor and adjacent to the brushes 41 and 42. A pump 44 operated by suitable motive power as motor 46 draws the cleaning solution through suction pipe 47 and supplies it through discharge nozzles 48 adjacent to the brushes. To facilitate handling of the solution I have secured an attachment 49 to the tank to include a drain 51 and an overflow 52 for the tank. The discharge of the solution takes place adjacent the brushes so that the frictional scrubbing of the outside of the cases occurs in the presence of the solution. The rotating brushes tend to throw and scatter the solution during their rotation. To overcome this, I secure arcuately formed guards 53 adjacent each of the brushes and extending about them so that the solution thrown off by the brushes is prevented from scattering generally and is drained down into the tank.

Where the phrase "a pair of brushes" appears in the claims, it is to be understood that two brushes, or other equivalent friction scrubbing means, at least are present, each on opposite sides of the conveyor means so that opposite parallel sides of the cases are cleansed.

The brushes and the conveyors are conveniently driven from a single source of power as motor 61 which carries upon its shaft 62 a spur gear 63 which engages a second spur gear 64 carrying an adjustable friction clutch 65. Friction clutch 65 acts upon and delivers power to shaft 67 upon which it is rotatably positioned. The clutch 65 includes means 66 for adjusting it so that if the machine becomes jammed, the clutch slips and nothing is damaged. Shaft 67 also carries driving gear 68 which transmits power from the shaft to sprocket 9 through a driven gear 69 and shaft 70 through gearing 71 to shaft 72 upon which sprockets 9 are secured. A chain sprocket 73 is also secured upon

shaft 67 and has a chain 74 extending about it from a second chain sprocket 75 which is carried by pulley shaft 76. Several pulleys 77 are mounted upon the pulley shaft and have belts 78 extending about them and about other pulleys 79, secured upon the rotatably mounted brushes 41 and 42, and about idler pulleys 81. The relationship of the various gears, sprockets and pulleys is such that the proper speed and direction of rotation together with sufficient power is furnished the various units from the single source of power.

Since the cases are usually oblong in outline, and since it is desirable that each exterior surface be washed, I preferably construct the machine of my invention in such a manner that corresponding sides of the cases are presented for washing at one time to set 41 of the brushes and at a subsequent time the other corresponding sides of the case are presented to the other set 42 of the brushes. To accomplish this, I provide constraining means for maintaining the cases in a predetermined relationship with respect to the conveyor over a portion of its path and other means for moving the cases to another position. This constraining means is preferably formed by a pair of angles 82 extending adjacent the conveyor and adapted to engage a member 83, usually square, secured upon shaft 31. The member 83 engages the angles and constrains the case engaging means against rotation. This constraint is preferably continued until after the conveyor has transported the case past set 41 of the brushes. The angles are then deformed to provide interruptions 84 whereupon rotation of the case may be had so that the other sides of the case, as yet unwashed, may be subject to the other set 42 of the brushes. To accomplish this I preferably provide upon the shaft 31 a Geneva cross or star 85 which, as is shown particularly in Figures 3 and 4, is adapted to be contacted by an abutment 86 extending through the interruption 84 to engage the cross as the conveyor traverses its path. This causes the case to swing about a path indicated diagrammatically by circle 87 of Figure 3 so that the case occupies a position at 90 degrees to its former position. I prefer that the opposite sides of the case which are nearest together be presented to the first set 41 of the brushes and the opposite sides which are farthest apart be presented to the second set. Accordingly, the second set 42 of brushes are spaced away from the conveyor for a greater distance than are the first set 41, as is shown in Figure 3. Following the engagement of the Geneva cross with the abutment 86 and the cleaning of the sides of the cases by the brushes 42, the position of the cases with respect to the conveyor is again changed so that they are removed 180 degrees from that position in which they originally entered the conveyor.

This is conveniently accomplished by providing other interruptions 91 and another abutment 92 to engage again the Geneva cross and rotate the cases. Following the travel through the machine the cases may be discharged to be removed therefrom and filled or stacked as desired.

I claim:

1. In a machine for washing the exterior vertical sides of a case, conveyor means for moving cases over a path, means on the conveyor means for engaging each case to retain the engaged case in a predetermined position relative to the conveyor means, a pair of brushes positioned on opposite sides of the conveyor means to engage and cleanse parallel and opposite vertical sides of cases moved relative to the brushes on the conveyor means, means for moving the case engaging means whereby each case is turned 90° in a horizontal plane relative to the conveyor means after engagement with the pair of brushes, and another pair of brushes positioned on opposite sides of the conveyor to engage and cleanse the unscrubbed parallel opposite vertical sides of said cases moved relative thereto on the conveyor means.
2. In a machine for washing the exterior vertical sides of a case, conveyor means for moving cases over a path, a pair of brushes positioned on opposite sides of the conveyor means to engage and cleanse parallel and opposite vertical sides of cases moved relative to the brushes on the conveyor means, means for moving each case whereby the case is turned 90° in a horizontal plane relative to the conveyor means after engagement with the pair of brushes, and another pair of brushes positioned on opposite sides of the conveyor to engage and cleanse the unscrubbed parallel opposite vertical sides of said cases moved relative thereto on the conveyor means.
3. In a machine for washing the exterior vertical sides of a case, conveyor means for moving cases over a path, means rotatably mounted on the conveyor means for engaging each case to retain the engaged case in a predetermined position relative to the conveyor means, a pair of brushes positioned on opposite sides of the conveyor means to engage and cleanse parallel and opposite vertical sides of cases moved relative to the brushes on the conveyor means, means for engaging the case engaging means to rotate said case engaging means whereby each case is turned 90° in a horizontal plane relative to the conveyor means after engagement with the pair of brushes, and another pair of brushes positioned on opposite sides of the conveyor to engage and cleanse the unscrubbed parallel opposite vertical sides of said cases moved relative thereto on the conveyor means.
4. In a machine for washing the exterior

vertical sides of a case, conveyor means for moving cases over a path, means on the conveyor means for engaging each case to retain the engaged case in a predetermined position relative to the conveyor means, a pair of brushes positioned on opposite sides of the conveyor means to engage and cleanse parallel and opposite vertical sides of cases moved relative to the brushes on the conveyor means, means for moving the case engaging means whereby each case is turned 90° in a horizontal plane relative to the conveyor means after engagement with the pair of brushes, another pair of brushes positioned on opposite sides of the conveyor to engage and cleanse the unscrubbed parallel opposite vertical sides of said cases moved relative thereto on the conveyor means, and means for moving the case engaging means through another 90° so that each case is substantially in its original position relative to the conveyor means.

5. In a machine for washing the exterior vertical sides of a case, conveyor means for moving cases over a path, means rotatably mounted on the conveyor means for engaging each case to retain the engaged case in a predetermined position relative to the conveyor means; the case engaging means including a rotatable support for a case, and a Geneva cross carried with said rotatable support; a pair of brushes positioned on opposite sides of the conveyor means to engage and cleanse parallel and opposite vertical sides of cases moved relative to the brushes on the conveyor means, means for engaging the Geneva cross on the case engaging means to rotate said case engaging means whereby each case is turned 90° in a horizontal plane relative to the conveyor means after engagement with the pair of brushes, and another pair of brushes positioned on opposite sides of the conveyor to engage and cleanse the unscrubbed parallel opposite vertical sides of said cases moved relative thereto on the conveyor means.

6. In a machine for washing the exterior vertical sides of a case, conveyor means for moving cases over a path, means rotatably mounted on the conveyor means for engaging each case to retain the engaged case in a predetermined position relative to the conveyor means; the case engaging means including a rotatable support for a case, and a Geneva cross carried with said rotatable support; a pair of brushes positioned on opposite sides of the conveyor means to engage and cleanse parallel and opposite vertical sides of cases moved relative to the brushes on the conveyor means, means for engaging the Geneva cross on the case engaging means to rotate said case engaging means whereby each case is turned 90° in a horizontal plane relative to the conveyor means after engagement with the pair of brushes, another pair of brushes

positioned on opposite sides of the conveyor to
engage and cleanse the unscrubbed parallel
opposite vertical sides of said cases moved
relative thereto on the conveyor means, and
5 means for moving the case engaging means
through another 90° so that each case is sub-
stantially in its original position relative to
the conveyor means.

10 In testimony whereof, I have hereunto set
my hand.

GODFREY CHRISTENSEN.

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