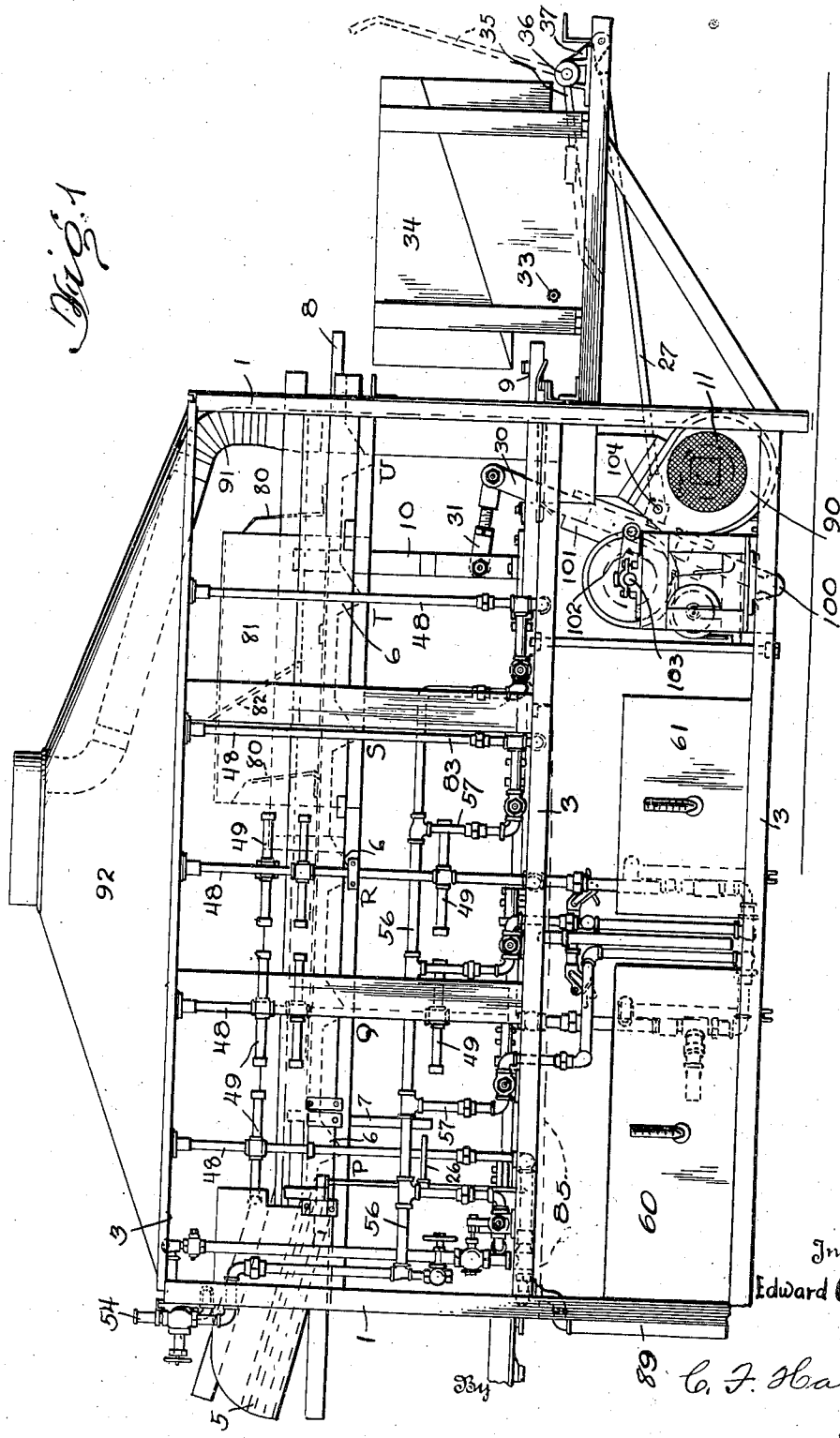
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CONVEYER FOR CANS AND CAN COVERS

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Fig. 1



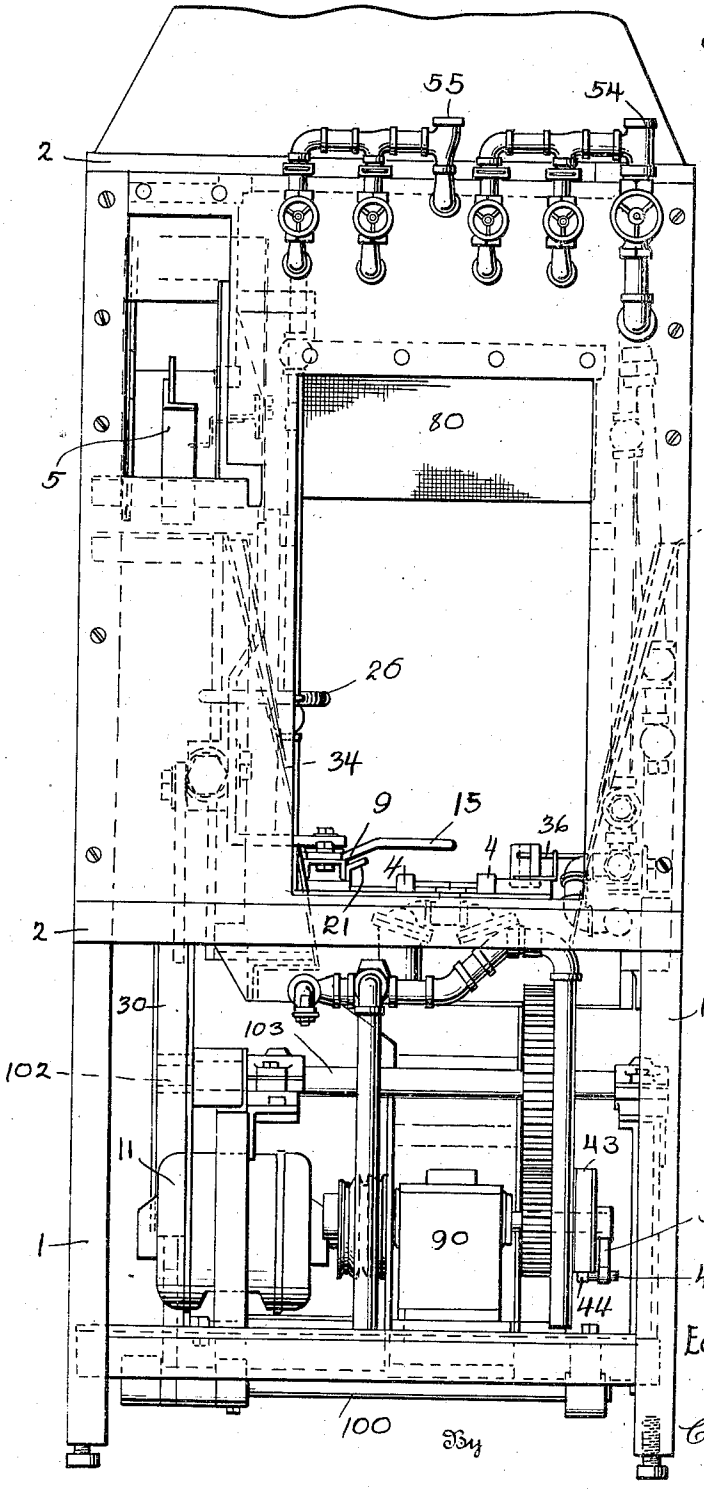
Inventor
Edward C. Damrow

C. F. Haden
Attorney

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CONVEYER FOR CANS AND CAN COVERS

Original Filed Aug. 1, 1935 5 Sheets-Sheet 2

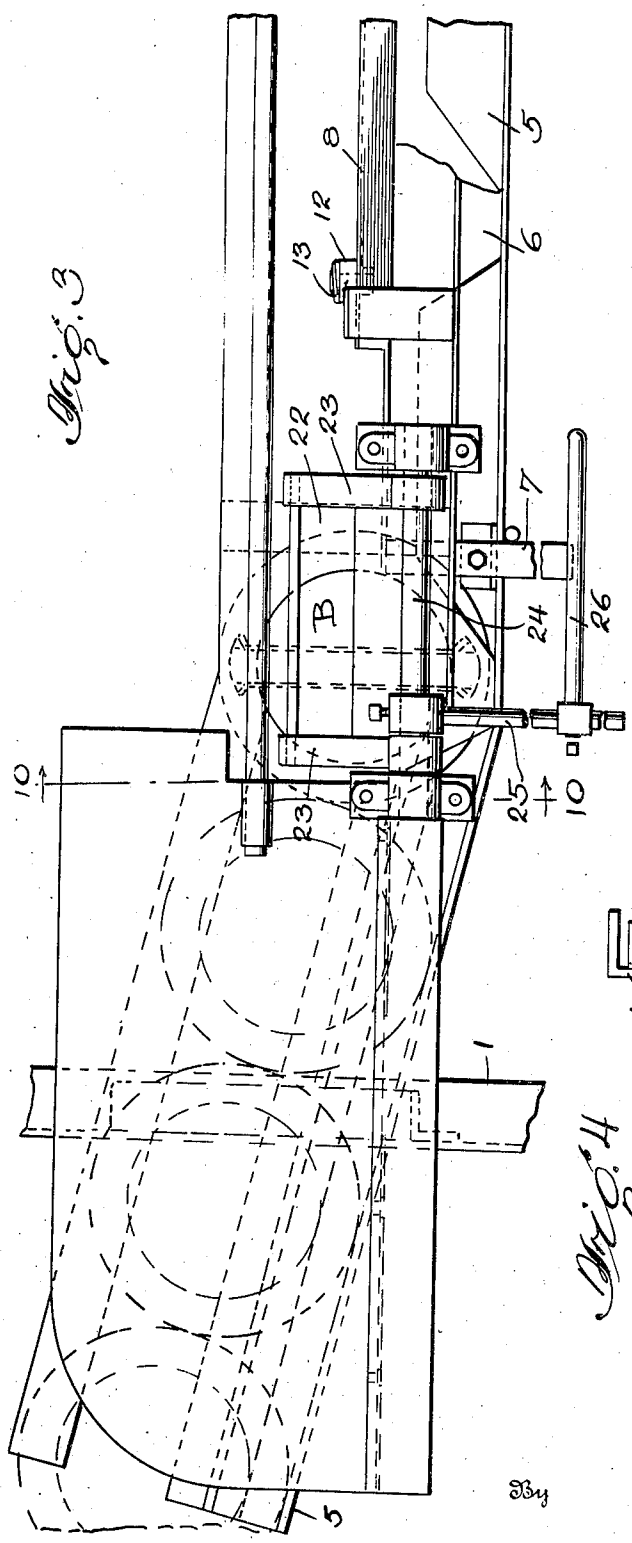


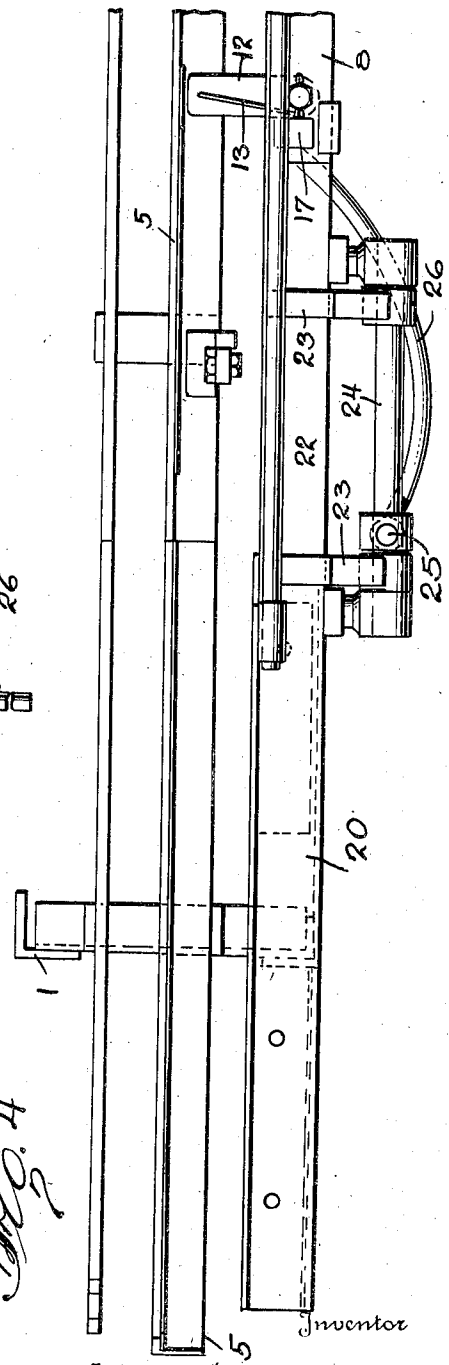
Inventor
Edward C. Damrow
By C. F. Hadlen
Attorney

March 28, 1939. E. C. DAMROW 2,152,244

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Inventor

Edward C. Damrow

By C. F. Haaden

Attorney

March 28, 1939. E. C. DAMROW 2,152,244

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Fig. 6

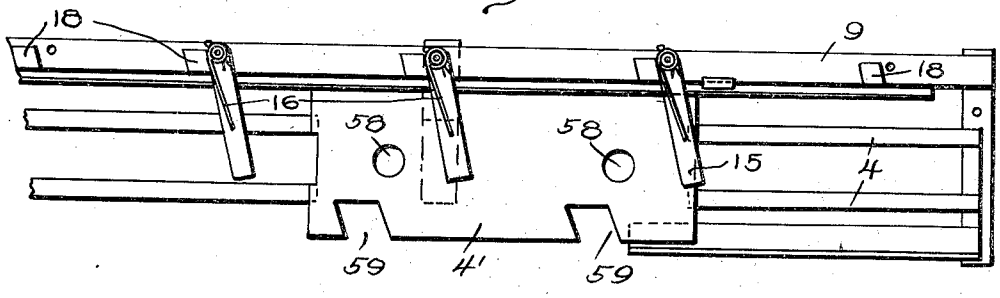
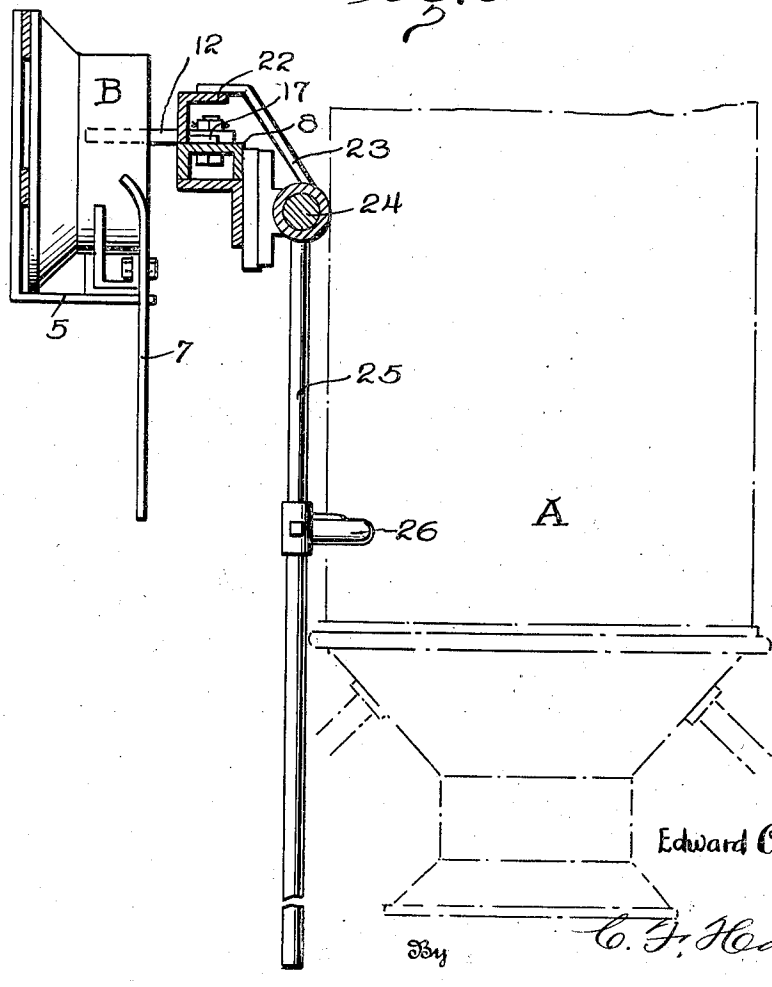


Fig. 5



Inventor
Edward C. Damrow

By C. F. Haden

Attorney

March 28, 1939. E. C. DAMROW 2,152,244

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Fig. 7

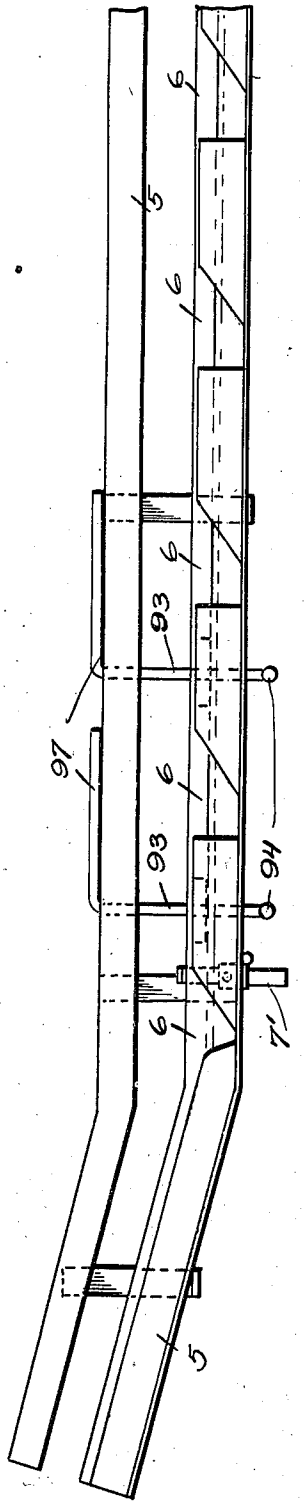
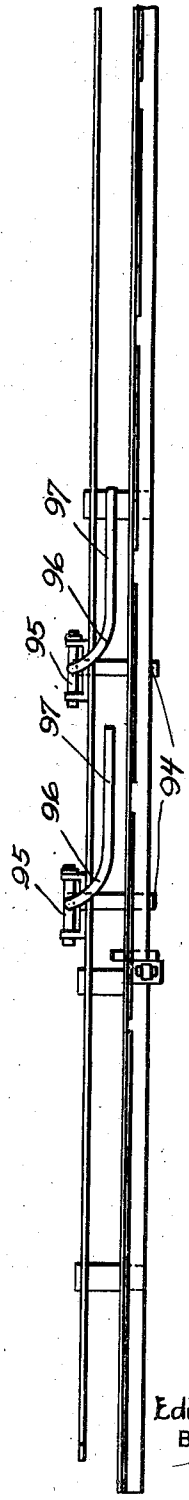


Fig. 8



INVENTOR
Edward C. Damrow
BY
C. F. Haden
ATTORNEY

Patented Mar. 28, 1939 2,152,244

UNITED STATES PATENT OFFICE

2,152,244

CONVEYER FOR CANS AND CAN COVERS

Edward C. Damrow, Fond du Lac, Wis.

Application August 1, 1935, Serial No. 34,281
Renewed January 21, 1939

2 Claims. (Cl. 198—221)

This invention belongs to the milk-can washing art.

The principal object is to provide a machine in which milk-cans and milk-can covers are moved automatically by a step by step progression simultaneously through the machine and subjected at each pause in their progression, successively, to a pre-rinsing, a treatment by a cleansing solution, another rinsing, a steam sterilization and a cold air drying, after which the can and its accompanying cover pass out of the machine; the can is upended into its proper upright position, a workman places the cover on the can and the covered can is delivered by the machine to an off-bearing conveyer.

The machine is so constructed that a plurality of can covers are held in a can-cover run-way unacted upon until a can is fed into the machine for treatment, upon which the presence of the can to be treated in the first, or pre-rinsing station so actuates the mechanism that thereafter the machine automatically feeds forward with the can a companion cover and both the can and its cover progress step by step through the machine and both receive the same cleaning treatment, simultaneously.

It is to be particularly noted that the can covers are moved forwardly only when there are companion cans accompanying them. Hence, if but one can is fed into the machine, it and its companion cover will progress step by step until the entire cleaning process is performed upon them, but the machine will deliver rinsing water, cleansing solution, sterilizing steam and drying air only at those stations where the can and its cover pause in their step by step progress through the machine; meanwhile any other can covers which have been placed in the can-cover run-way will remain there unacted upon until another can has been placed in the pre-rinsing station and then when the new can is fed forwardly by the machine a companion cover is taken with it.

In order that the construction and the operation of my invention may be fully understood I file herewith, to form part of this specification 5 sheets of drawings illustrating the best construction now known by me for practicing my invention, in which

Figure 1 is a right-hand side elevation of the entire machine;

Fig. 2 is an elevation of the feeding-in end of the machine, the tanks being removed to permit the driving mechanism to be seen at the far end of the machine;

Fig. 3 is an elevation of a portion of the can-cover run-way;

Fig. 4 is a plan view of the parts illustrated in Fig. 3;

Fig. 5 is a sectional view taken on the line 10—10 of Fig. 3;

Fig. 6 is a plan view of the can track and the pawl-slide 9;

Fig. 7 is an elevation view of the can cover race-way; and

Fig. 8 is a plan view of the can cover race-way.

Throughout the several views each particular reference character, wherever found, is applied to the same element.

The working parts of my machine are supported by a frame composed of upright corner posts 1, cross bars 2, and longitudinal stringers 3.

Milk cans A, and milk can covers B, are fed into the machine at the left-hand end (Fig. 1) and are propelled through the machine, simultaneously, by a step by step progression and delivered at the right-hand end.

The milk cans A are fed in upside down or in an inverted position upon a track which is composed of slats 4 and a steam plate 4', Fig. 6.

The milk can covers B are supported upon a run-way 5, above the cans.

Run-way 5 extends the full length of the machine and at its entrance end it is upwardly inclined so the can covers roll down the inclined portion by gravity.

There are six notches 6 in run-way 5 into which the can covers B drop and come to rest where they remain until they are positively drawn out by mechanism provided for that purpose.

These six notches 6 in run-way 5 have been designated as stations by the letters P, Q, R, S, T, and U in the description which follows and they are in registration with the positions occupied by the milk cans A below them while they are undergoing cleansing operations.

The first can cover B fed into the run-way, rolls down the upwardly inclined portion, drops into the first station notch 6 at P and comes to rest against a freely swinging gravity actuated stop 7. (Figs. 1, 3 and 5.)

The upwardly inclined portion of run-way 5 serves as a storage place for can covers. It is shown of a length sufficient to accommodate four can covers; but it may be made longer or shorter, if desired.

The can covers B remain stored in the upwardly inclined portion of run-way 5 until the first or forward can cover is positively pulled out of the notch 6 which constitutes station P, whereupon

the second can cover rolls down, strikes stop 7 and comes to rest in the notch 6 which is designated station P, the preceding cover having been positively moved to the second notch 6 or station Q.

The positive step by step feeding or moving of the cans A and the can covers B forwardly from station to station is done by two pawl or dog carrying slides 8 and 9, connected by a rigid upright bar 10, (Fig. 1).

Bar 10 is given a slow forward and backward movement sufficient in extent to drag a can A and its companion cover B from one station to the next station by a motor 11.

Pawl carriers or slides 8 and 9 are each provided with six spring actuated pawls symmetrically spaced the same distance apart the six stations, P. Q. R, S, T, and U are spaced.

Pawls or dogs 12, actuated by springs 13, on pawl carrying slide 8, (Figs. 4 and 5) and pawls or dogs 15, actuated by springs 16, on slide 9, (Fig. 6) contact with a cover and a can, respectively, and pull them forwardly from one station to the next station as the slides are moved towards the right (Fig. 1); but on their return from right to left, the dogs are folded back against the action of their springs when they contact the next cover or can, respectively, but as soon as the slides move towards the left sufficiently far for the ends of the pawls to escape the can covers and the cans, springs 13 and 16 swing pawls 12 and 15, respectively, to their operative positions against their stops 17 and 18, (Figs. 4 and 5) ready to engage a can and a cover on their next movement towards the right and drag them to the next station in their progress through the machine.

Provision is made for rendering the first pawl 12, on slide 8 inoperative, excepting when there is a milk can located at station P.

In the absence of a milk can at station P the first pawl 12 strikes an angle plate 22 Fig. 5, every time it moves towards the left and is folded back, against the tension of its spring and held out of operative contact with the can cover located at station P. All the other pawls 12 on slide 8 operate in a normal way so that if there are can covers located at any of the other stations or at all the other stations, Q, R, S, T, and U, they will be moved one station to the right, step by step, every time the slide 8 is moved towards the right.

Normally, the first pawl 12 is inactive. All the other pawls on both slides 8 and 9 are normally active. The first pawl 12 is rendered active every time a can is placed in station P. The construction which governs the operation of the first pawl 12, is as follows:

A folding or release angle 22 normally drops down into the path of the first pawl 12 and folds it back and holds it so that its spring 13 cannot swing it into operative positon to grasp a cover at the first or station P. Release angle 22 (Figs. 4 and 5) is fixed to bars 23 which, at their other ends are fixed to a shaft 24. On shaft 24 a cover release rod 25 is fixed, and on cover release rod 25 is adjustably attached a cover release trip 26, so positioned that it is operated by any milk can located at station P.

From this construction it happens that when a milk can is placed in proper pre-rinse position at station P it contacts cover release trip 26 and pushes it aside, which swings cover release rod 25 and oscillates shaft 24 to which bars 23 are fixed; the opposite ends of bars 23 lift release angle 22 sufficiently to permit spring 13 to swing first pawl 12 out against its top 17 in position to engage can cover B at station P at the next movement towards the right of slides 8 and 9 and can cover B and its companion can A will both be moved to the next station to the right.

Can covers B and cans A are fed into the machine at the left hand end (Fig. 1). The covers B and the cans A are given a pre-rinsing at station P and, afterwards, by a step by step progression through the machine they are stopped at stations Q, R, S, T, and U, where they are given treatment by a solution wash at station Q, a hot water rinse at station R, two sterilizing treatments at stations S and T, and a cold air drying at station U and then discharged from the machine.

Slide 8 with its pawls or dogs 12 gives the step by step movements to can covers B.

Slide 9 with its pawls or dogs 15 gives the step by step movements to cans A.

These two slides 8 and 9 being connected by upright rigid bar 10, it is obvious that they must move as a unit and, therefore, the cans and the can covers are moved simultaneously from one station to the next station.

At each station the can and its companion cover are under treatment during the time required to move the pawls to the left sufficiently to engage the next succeeding can and can cover; and this period of time may be varied as desired by the reduction gearing introduced between the prime mover and the slides.

A pitman 31, adjustable as to length, is connected to upright rigid bar 10 at one of its ends, and at its other end it is connected to an oscillatable lever 30. Motion is given to lever 30 by a crank arm 102 which is fixed to and revolves with a shaft 103. At its outer end crank 102 is connected to a sliding boxing 101 which surrounds lever 30 and slides lengthwise thereof. Lever 30 is oscillatably mounted at its lower end to cross shaft 100 carried by the lower longitudinal stringers 3 of the machine frame.

As soon as the can is moved forward out of contact with cover release trip 26, the cover release angle 22 drops back into its normal position and folds back the first pawl 12, out of can cover contacting position. This first pawl 12 is held inactive until another can has been placed at station P. If no other can is fed into the machine, it continues to operate upon the cans and can covers, already started through, in the usual step by step way, until they are cleansed and discharged from the machine at the right hand end. When, however, the machine is operated to capacity, and a continuous series of cans and can covers is fed in, the last can of the series placed at station P will contact cover release trip 26 and thereby lift cover release angle 22, as explained and let pawl 12 swing outward into operating positon and grab another can cover to be moved through the machine, step by step, with its companion can. Thus, while the machine will start cans through without a companion cover, if no covers are supplied to the can cover track 5, it will not start a cover through without a companion can.

When the can is discharged from the machine it tips forwardly and slides down a turn plate, strikes rubber covered rod 33 and falls upon rubber covered cradle rods 35, being guided in its fall by the can guide plates 34.

A good and inexpensive way to provide rubber cushioning covers for rod 33 and rods 35 is to

slide over them pieces of ordinary garden hose, of the proper size and length.

Cradle rods **35** are fixed to cross shaft **36**, and shaft **36** has a crank arm **37** on one end, operated by a connecting rod **27** which is pivotally connected at its other end to the sliding box **101** at the point **104**.

When slides **8** and **9** are at the limit of their motion towards the right, as shown in Fig. 1, the can receiving cradle is in can receiving position, as shown in that view; but when slides **8** and **9** are at the limit of their movement towards the left, the can receiving cradle rods **35**, will have been swung to the position indicated by dotted lines in Fig. 1 and the last can discharged from the machine will have been lifted thereby and deposited in an upright position upon an off-bearing conveyer provided at that point to receive it.

Can covers are not always uniform in thickness or depth and, for that reason, some of them, as they are forcibly drawn from one notch **6** to the next notch **6**, travel irregularly or wabble, and instead of rolling easily take an angular position in the race-way and, because of their rubbing on the different bars of which the race-way is composed, sometimes offer considerable unnecessary resistance to the mechanism which pulls them along and sometimes badly dented can covers will stop the machine. As it is desirable to have a friction clutch adjusted to slip and prevent breaking of any part of the machine when but a small amount of excess power is required, I employ the can cover righting device shown in Figs. 7 and 8 to right the can covers and keep them in freely rolling position to reduce the resistance to a minimum.

A can cover righting device may be employed at every station notch **6**, if desired, but in Figs. 7 and 8 only two can cover righting devices are illustrated which are ample to explain their location, construction and operation.

On the outside of one of the plates of which the race-way is composed I place a pivoted vertical rod or bar **93** having a weighted part **94** projecting transversely under the race-way. Bar **93** is pivoted to the outer side of the race-way as shown at **95**, or in any other well known way so that it can be swung freely upon its pivots by weight **94**. At its upper end bar **93** is curved forwardly as at **96** and then projects in the direction of the travel of the can covers, parallelly, above the race-way, as at **97**.

When the can cover is dragged out of a notch **6**, it comes into contact with the portions **96** and **97** of a can cover righter which it pushes aside against the gentle resistance of weight **94**. The part or weight **94** extending under the race-way **5** serves as a gravity balance weight to hold the can cover, lightly, in an upright position on its rim, against an inner plate of the race-way and thus prevents any wabbling or binding of the can cover.

It will be observed that can-dragging pawls **15** are held by their stops **18** inclined towards the direction of travel of the cans; best shown in Fig. 6. The reason for this is that so positioned, they crowd the cans toward the side upon which pawl-slide **9** is located and hold the rim of the can under guide rail **21**, and keep the can from tipping during its passage through the machine.

The operation is as follows:

A can cover is placed in the upwardly inclined storage or hopper space of run-way **5**. It rolls down, drops into the first notch **6** or station P, and its momentum is checked by stop **7**, which prevents it bounding out of the station P notch in the run-way.

Three more can covers are then placed in the storage space, which fill it in the machine shown in the drawings.

The motor **11** is then stated and the pawl-carrying slides are slowly reciprocated.

As pawl-folding baffle angle plate **22** is normally in position to prevent the first pawl on pawl-slide **8** from engaging the can cover at station P, the machine merely runs idle. No can covers are moved, no valves are opened, and no water, or steam is lost.

The attendant then places an inverted can on the can track slats **4**, and pushes it into position at station P. The can contacts trip **26** and raises baffle angle piece **22** out of the path of the first pawl **12** on pawl-slide **8**.

Just before the limit of the pawl-slide's motion towards the left, (Fig. 1) pawl **12**, which was folded back against the resilience of its spring **13** by striking the can cover, passes beyond the can cover and is swung to cover grasping position by spring **13**, ready to haul the can cover to station Q upon the return of slide **8** towards the right. At the same time pawl **15** on pawl-slide **9**, which was folded back against its spring **16** by contact with the can neck, passes far enough to the left to escape the can neck, and is swung into can hauling position by its spring **16**.

As soon as the can leaves station P, the attendant places another can upon the can track slats **4**, ready to be pushed into station P, and another can cover in race-way **5**.

When pawl slides **8** and **9** make another trip towards the right, they haul two can covers and two cans one step to the right, leaving a can and a can cover in station R and another can and a can cover in station Q, and as soon as the can cover which was in station P is dragged out, another can cover immediately rolls into the then empty station P. At the same time the atendant places another can in station P.

When the machine moves the cans and their companion covers one more step towards the right the can in advance tips and slides down plate **32**, strikes rubber covered rod **33**, and falls upon rubber covered cradle arms **35**. The can cover is taken by an attendant who puts it upon the can as soon as the can is uprighted by cradle arms **35** and set upon an off-bearing conveyer provided at this point.

As a matter of fact the can cover is received by a can cover replacing machine, which puts the cover on the companion can as soon as the can is set in an upright position by the cradle arms **35**.

Having fully described my invention and the best mode I now know of practicing it, I do not wish to be restricted to the exact details shown and described; because the machine is capable of many changes and variations in construction without departing from the spirit of the invention.

I claim as my invention everything embraced within the scope of the following claims:

1. In conveying mechanism for cans and can covers in a milk can and milk can cover washing machine the combination of a reciprocating feeder for the cans, a reciprocating feeder for the can covers above the can feeder, means for rigidly connecting the two feeders so they will move simultaneously in the same direction, a

separate trackway for each feeder, means for reciprocating the feeders along their respective trackways, a series of spring actuated pawls on each feeder, means for preventing the initial forward feeding of a can cover excepting simultaneously with its companion can comprising a baffle placed lengthwise of the can cover trackway to fold the first cover feeding pawl into inoperative position, an oscillatable shaft journaled on the side of the can cover trackway opposite the baffle, a baffle lifting arm fixed to the baffle and the oscillatable shaft, a down-hanging rod adjustably connected to the shaft, a wiper in the line of travel of the cans adjustably mounted upon the down-hanging rod to be contacted by a can when placed in initial can feeding position whereby the wiper and the down-hanging rod are pushed aside, the shaft is oscillated, and the baffle is lifted out of pawl folding position.

2. In conveying mechanism for cans and can covers in a milk can and milk can cover washing machine the combination of a reciprocating feeder for the cans, a reciprocating feeder for the can covers located above the can feeder, means for rigidly connecting the two feeders so they will move simultaneously in the same direction, a separate trackway for each feeder, means for reciprocating the feeders along their respective trackways, a series of spring actuated pawls on each feeder, means for preventing the initial forward feeding of a can cover excepting simultaneously with its companion can comprising a longitudinally disposed baffling angle plate to form a raceway in which the first can cover feeding pawl folds and reciprocates, an oscillatable shaft, an arm connecting the shaft and the angle plate, a depending actuating rod fixed to the shaft, an adjustable wiper fixed to the depending rod in the line of travel of the cans to be pushed aside by a can in initial feeding position whereby the shaft is oscillated and the baffling angle plate is lifted to permit the first can cover feeding pawl to function.

EDWARD C. DAMROW.