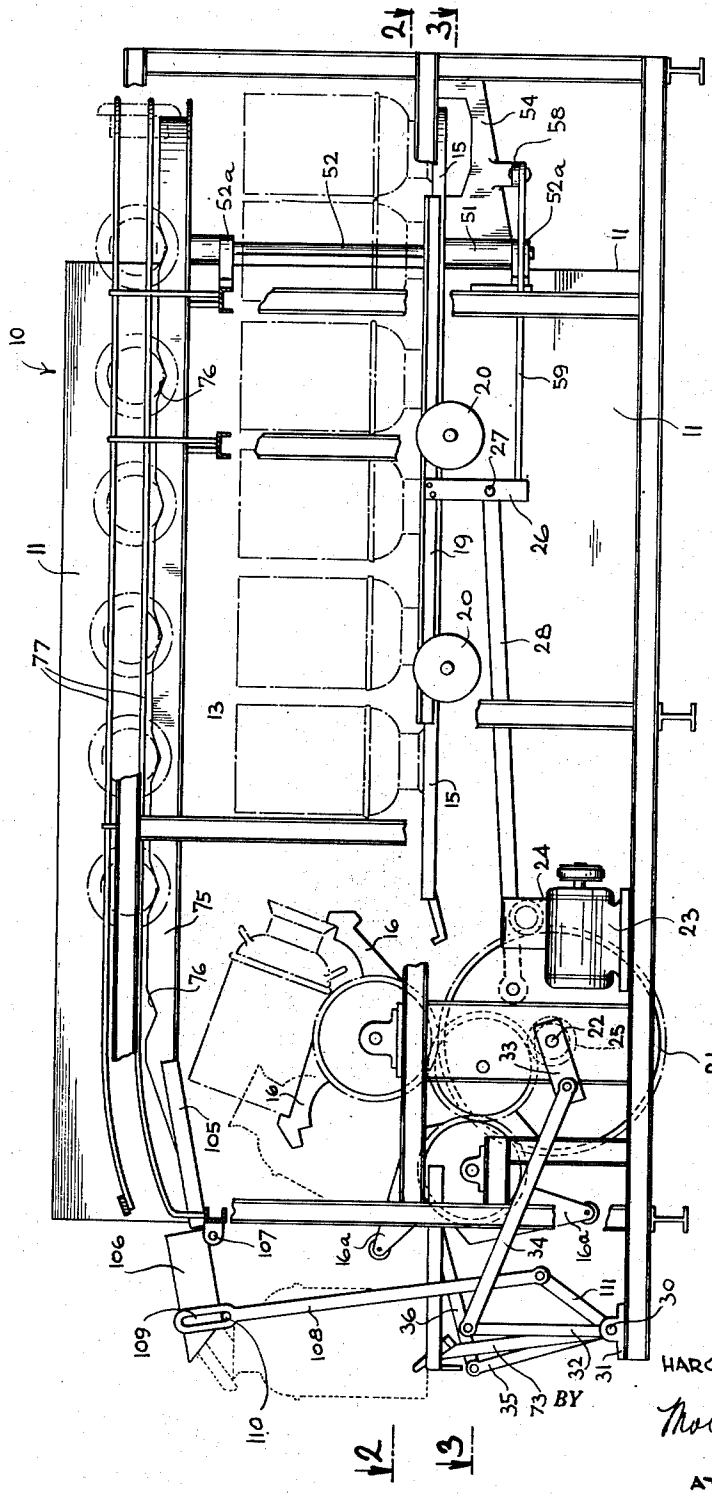
Sept. 9, 1952 H. M. KENDALL 2,609,916

MACHINE FOR CLEANING RECEPTACLES

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FIG. 1.



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MACHINE FOR CLEANING RECEPTACLES

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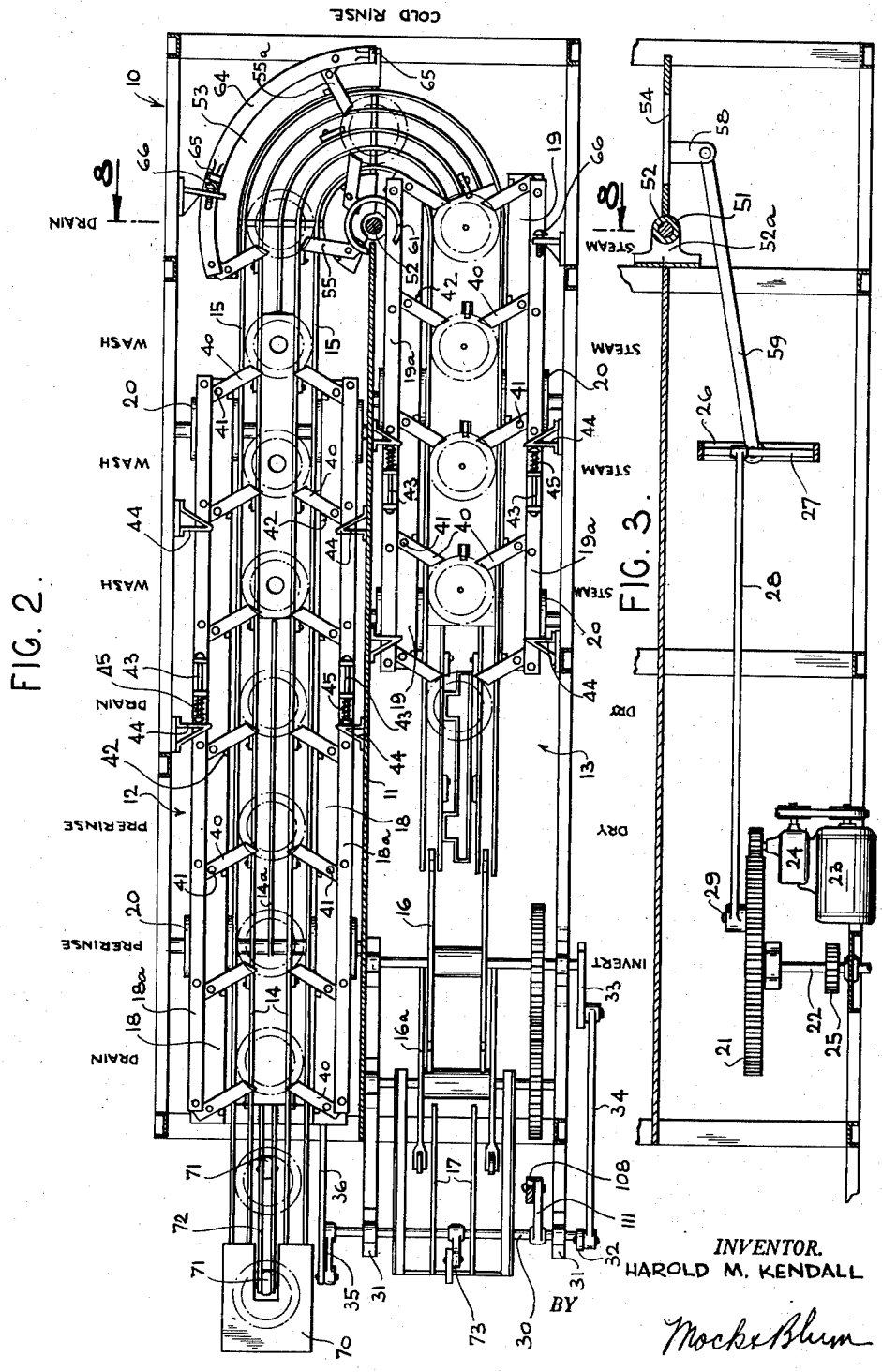


FIG. 2.

FIG. 3.

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MACHINE FOR CLEANING RECEPTACLES

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FIG. 4.

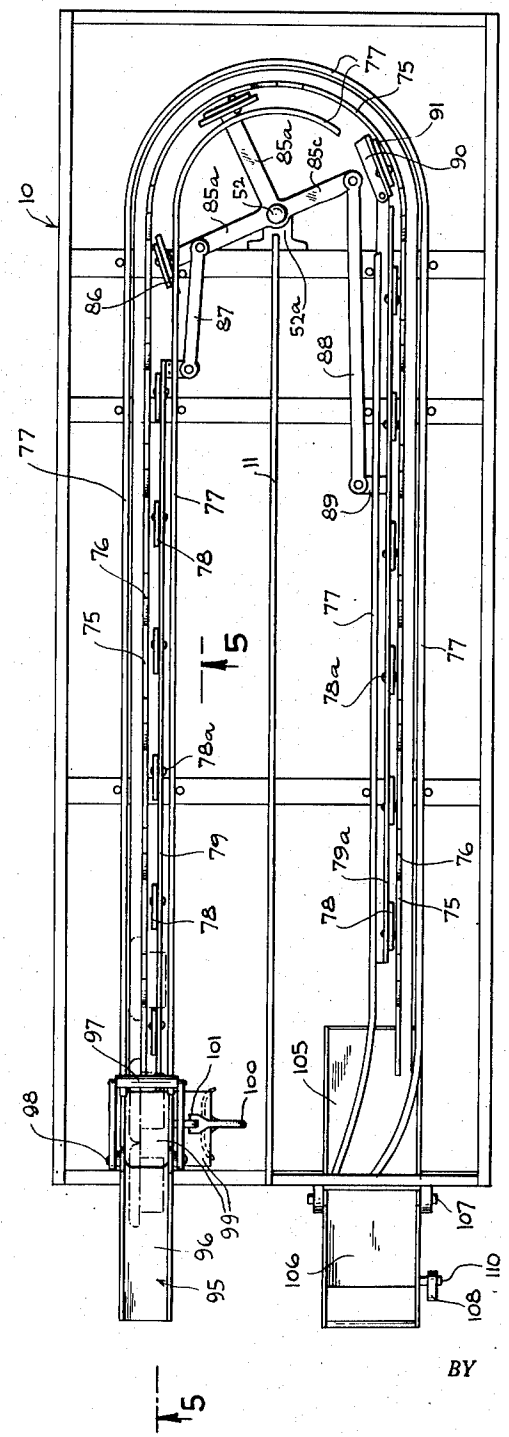
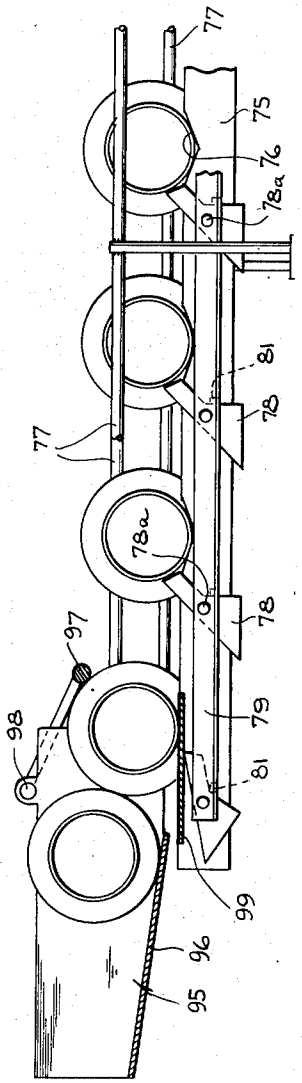


FIG. 5.



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MACHINE FOR CLEANING RECEPTACLES

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FIG. 6.

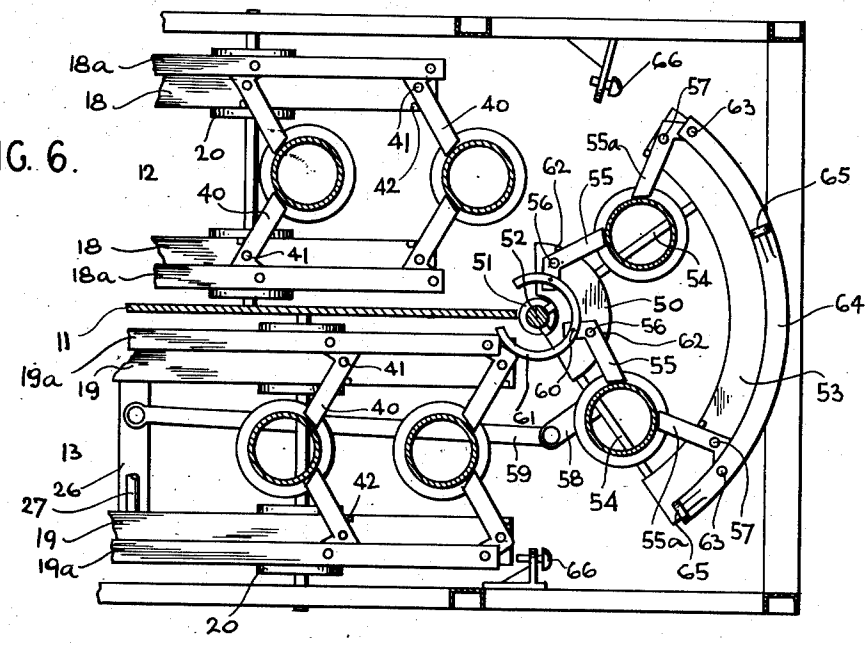
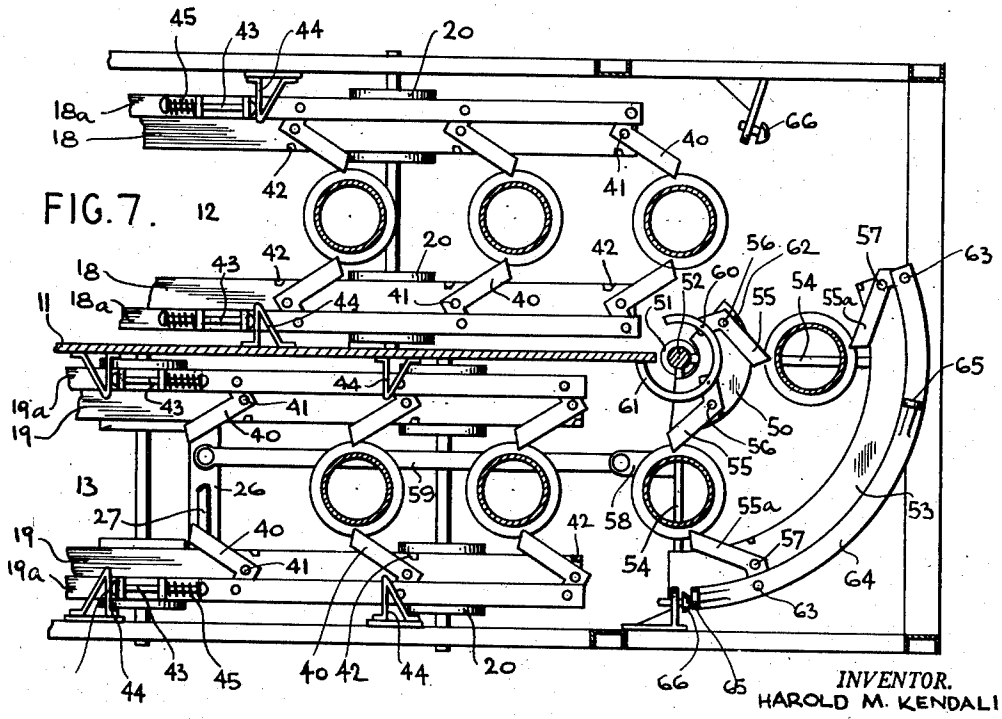


FIG. 7.



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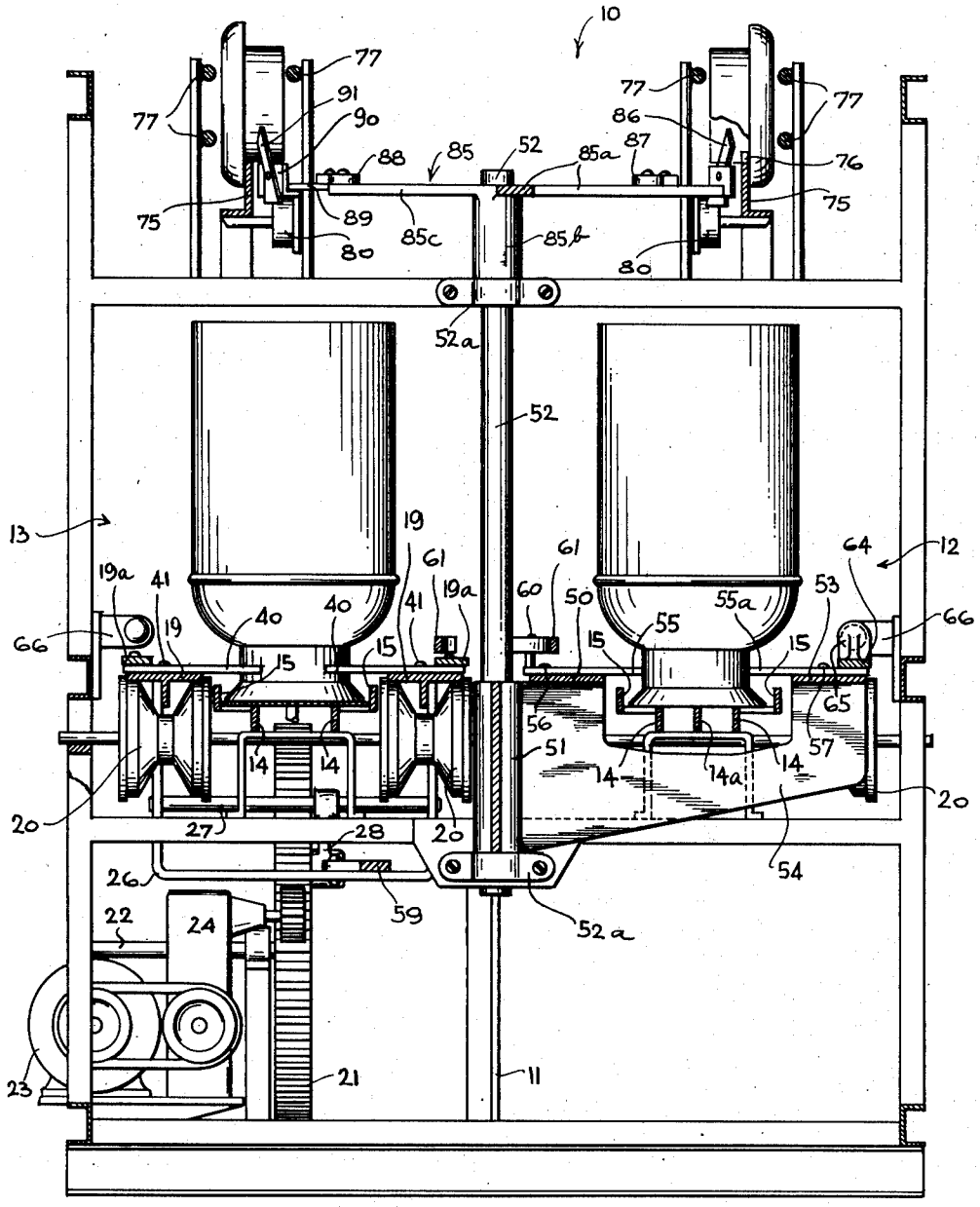
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MACHINE FOR CLEANING RECEPTACLES

Filed Sept. 3, 1949 5 Sheets-Sheet 5

FIG. 8.



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UNITED STATES PATENT OFFICE

2,609,916

MACHINE FOR CLEANING RECEPTACLES

Harold M. Kendall, Potsdam, N. Y.

Application September 3, 1949, Serial No. 114,046

4 Claims. (Cl. 198—82)

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This invention relates to an improved machine for cleaning receptacles and receptacle covers and, more especially, for cleaning milk cans and covers.

It is an object of the invention to provide a compact, improved can washing machine of the type wherein the cans are intermittently fed to successive washing, steaming and drying stations in inverted position, the machine being arranged and constructed in such a manner as to greatly conserve space in contrast with conventional washing machines of the same general type.

Another object of the invention is the provision of a machine of the character indicated which is designed and constructed in such a manner as to prevent the rinsing and wash waters used in the preliminary stages of the cleaning operation from contaminating the cans that are being sterilized and dried in the latter stages of the operation.

A further object of the invention is the provision of a can washing machine having but one open end and a central partition defining a pair of cleaning compartments on both sides thereof and wherein the path of travel of the cans is reversed so that the cleaned uprighted cans are delivered at the front opening in full view of the operator, thereby providing better inspection and control of the cleaning operation and allowing the operator to stop the machine in the event of fouling or jamming of the cans.

Another object of the invention is the provision of a machine of the character indicated which will allow the incoming and outgoing can conveyors to run side by side and to pass through the same opening in the building or processing plant in which the machine is located.

The foregoing objects as well as additional objects and advantages of the invention will be readily apparent in the course of the following detailed description taken in connection with the accompanying drawings, which illustrate a preferred embodiment of the invention and wherein:

Fig. 1 is a diagrammatic side elevation of a return-line can washer incorporating the features of the invention;

Fig. 2 is a sectional view taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional view taken substantially on line 3—3 of Fig. 1;

Fig. 4 is a plan view of the cover indexing mechanism including means at the closed end of the can washer for moving the covers in an arcuate or semi-circular path from the washing compartment to the sterilizing and drying compartment and reversing the path of travel of the covers;

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Fig. 5 is a fragmentary sectional detail taken substantially on line 5—5 of Fig. 4;

Fig. 6 is a fragmentary plan view illustrating the initial phase of movement of the rotary can indexing mechanism at the closed end of the can washer and the correlative movement of the oppositely reciprocating can indexing mechanism in the first and second compartments of the can washer;

Fig. 7 is a view similar to Fig. 6, illustrating a subsequent step in the movement of the rotary can indexing mechanism and the linear oppositely reciprocating can indexing mechanism and showing the manner in which the can-indexing fingers release the respective cans at the termination of the clockwise stroke of the rotary mechanism prior to the reassumption of the operative position illustrated in Fig. 2; and

Fig. 8 is an enlarged sectional view taken substantially on line 8—8 of Fig. 2 and illustrates the operation of the rotary indexing mechanism for both the cans and their respective covers.

Heretofore, it has been well known to clean milk cans by intermittently feeding the cans in inverted position through a machine having a plurality of cleaning stations at which the cans were successively subjected to the action of rinsing water, washing water, steam, air and the like. In machines of this type the cans have been fed through the machine in a linear path, entering the machine at one end and leaving it at the opposite end. Health department regulations have required an increasing number of treating stations resulting in the use of straight line machines of considerable length, for example, one conventional type can washer having a capacity of 16 cans per minute is 24 ft. 10½ inches in overall length and 3 ft. wide. Thus, in many cases plants have found it necessary to make extensive repairs and remodeling in their facilities which frequently involves rebuilding existing weigh stands at great expense.

Furthermore, the control of the wash water in conventional straight line can washers and the prevention of contamination of the cans being sterilized and dried in the final stages of the operation has been exceedingly difficult since the distance between the can in the last washing position and the can in the first steaming position is relatively short. The outside wash for the cans is normally carried out in a continuous operation, in contrast to the inside wash which is usually intermittent, and the tendency of the wash water to splash upon the cans being steamed and dried results not only in contamination but also militates against efficient drying.

However, by the practice of the present invention, the indicated disadvantages of conventional straight-line washers are completely eliminated. In the present machine, which may be conveniently designated a return-line washer, only one opening is provided for the entrance and exit of cans, the machine being formed with a central partition defining a pair of compartments on both sides thereof and the path of travel of the cans being reversed at the closed end of the washer to return the cleaned and uprighted cans to the common entrance and exit opening at the front of the washer. Thus the washing operations are confined entirely to one side of the central partition in the entrance compartment and the steaming and drying operations are carried out on the opposite side of the central partition in the exit compartment with the result that it is impossible for contaminated wash water to contact the cans being steamed and dried. Moreover, the present return-line washer results in a great saving of space over the conventional straight-line washer, the return-line washer being approximately one-half the length and less than twice the width of a conventional washer having the same can capacity.

Referring now to the drawings in greater detail, the machine is designated generally by reference numeral 10 and is provided with a central vertical partition 11 defining a first receiving or entrance compartment 12 and a second delivery or exit compartment 13. The cans to be cleaned are inverted and placed in the loading position anterior to the compartment 12. The cans are moved progressively from station to station within the machine with the mouth of each can resting slidably upon a main pair of fixed rails 14. A pair of lateral rails 15 may be provided to prevent lateral displacement of the cans as they travel through the machine and an auxiliary central rail 14a may be disposed intermediate rails 14 along such portions of the path of travel of the cans as are unobstructed by supplemental equipment such as pipes, nozzles, draining tanks and the like.

The mechanism for indexing or feeding the cans in successive intermittent strokes from station to station includes novel means for moving the cans in a semicircular or arcuate path at the closed end of the machine in order to reverse the path of travel of the cans from first compartment 12 into second compartment 13. The cans are finally passed into the inverter 16, after having been steamed and dried in compartment 13, to be uprighted and delivered at the front open end of the machine. Inverter 16 is preferably of the continuously rotating type and its rotation is synchronized with the movement of the can indexing mechanism so that a can will be indexed into the inverter during the forward movement of the can indexing mechanism to be subsequently inverted to uprighted position and deposited on stationary can bars 17 on the exit side of the machine anterior to second compartment 13. Alternatively, the inverted mechanism may be of any other suitable construction such as the intermittently rotating type described fully in Patent No. 2,129,137, dated September 6, 1938 and issued to Ira H. Kendall.

During the operation of the machine the cans are simultaneously moved rearwardly in first compartment 12 and forwardly in second compartment 13 toward the inverter 16. In order to accomplish this effect, T-bars 18 in said first compartment and T-bars 19 in said second compartment are suitably mounted, as on rollers 20, to reciprocate simultaneously in opposite directions. The reciprocation of the can indexing mechanism including T-bars 18 and 19 is produced by the rotation of a gear wheel 21 disposed on main shaft 22 and driven from a motor 23 through a suitable gear reduction unit 24, as clearly shown in Figs. 1, 2 and 3. Shaft 22 carries a gear 25 which may form part of a gear train (see Fig. 1) for securing the desired synchronization of rotation of inverter units 16 and 16a. T-bars 19 are interconnected by a cross member 26 carrying a cross pin 27 and a pitman 28 connects said cross pin with crank pin 29 of gear wheel 21 so that T-bars 19 will reciprocate in unison upon the rotation of gear wheel 21.

The simultaneous reciprocation of T-bars 18 in a direction opposite to that of T-bars 19 may be accomplished by means of a rocker shaft 30 supported in suitable bearings 31 fixed to the frame of the machine. Said rocker shaft is substantially parallel to a shaft 22 and carries at one end a rocker arm 32 which is connected to a crank arm 33 of shaft 22 by means of a linkage 34. A rocker arm 35 is fixed to the inner end of rocker shaft 30 and a pitman member or linkage 36 connects said rocker arm 35 with one of the T-bars 18, it being understood that T-bars 18 are interconnected to reciprocate in unison. By reason of the described arrangement the simultaneous reciprocation of T-bars 18 and 19 in opposite directions is assured so that cans will be progressively moved rearwardly in first compartment 12 and forwardly in second compartment 13 toward the inverter unit 16. Opposed pairs of can indexing fingers or feeding dogs 40 are pivotally mounted along T-bars 18 and 19 at 41 for engaging the necks of the inverted cans and sliding the cans along the fixed rails 14. Feeding dogs 40 are preferably L-shaped and are pivotally connected at their outer ends to longitudinally movable dog-bars 18a and 19a in compartments 12 and 13 respectively. Feeding dogs 40 are retained in limiting operative position, illustrated in Figs. 2 and 6, by means of stops or abutments 42 suitably disposed along T-bars 18 and 19. The movement of dog-bars 18a and 19a at the termination of the forward and retractive strokes of T-bars 18 and 19 causes the feeding dogs 40 to alternately assume their inoperative open position (shown in Fig. 7) and their closed operative position (shown in Figs. 2 and 6). For this purpose, dog-bars 18a and 19a are provided with spring rods 43 which operatively engage fixed stops 44 secured to the central partition 11 and the frame of the machine, as clearly shown in Fig. 2. It is preferred to provide rods 43 with springs 45 in order to absorb the shock of the impact of said rods against respective stops 44 at the termination of the forward and retractive strokes of the assembly.

Means are provided adjacent the rear or closed end of the machine for moving the cans in a semi-circular or arcuate path in order to reverse the direction of travel of the cans and to convey them from first compartment 12 into second compartment 13 in synchronization with the reciprocatory movement of T-bars 18 and 19. Referring to Fig. 2, it will be seen that can rails 14 extend continuously through compartments 12 and 13 and that a 180 degree return bend or curved rail portion interconnects the oppositely extending linear portions. A rotatable inner member or segment 50 is preferably carried on a sleeve 51 fixed to a vertical shaft 52 situated

adjacent the rear end of central partition 11 and mounted in suitable bearings 52a.

An outer member or segment 53 is rigidly secured to inner segment 50 by means of cross members 54, which underlie the return bend portion of can rails 14, so that said inner and outer segment will rotate in unison. Opposed pairs of indexing fingers or feeding dogs 55 and 55a are pivotally mounted at 56 and 57 on inner and outer segments 50 and 53 respectively for sliding the cans around the return bend portion of the machine as segments 50 and 53 rotate in unison. The oscillation of segments 50 and 53 is synchronized with the reciprocation of T-bars 18 and 19 so that cans at the drain and cold water rinse stations along said segments will be moved progressively around the return-bend portion of can rails 14 to the first steaming station of compartment 13. In order to cause the oscillation of segments 50 and 53 and shaft 52, one of the cross members 54 is provided with an arm 58 to which is pivoted one end of a pitman member 59 which is pivotally connected at its other end to cross member or yoke 26 which interconnects T-bars 19, as clearly shown in Figs. 1 and 3. The outer ends of inner feeding dogs 55 are pivotally connected at 60 to a dog-bar segment 61, the opposite ends of which abut the central partition 11 at the termination of the respective forward and retractive strokes of inner segment 50 in order to cause said inner feeding dogs to assume their open inoperative position and their closed operative position as shown respectively in Fig. 7 and in Figs. 2 and 6. Inner feeding dogs 55 are retained in their limiting operative position by means of fixed stops 62 mounted on inner segment 50. The outer ends of outer feeding dogs 55a are pivotally connected at 63 to an outer dog-bar segment 64 which is provided with upstanding lugs 65 adapted to abut fixed stops 66 secured to the frame of the machine at the termination of the forward and retractive strokes of outer member 53 in order to dispose said outer feeding dogs in their respective inoperative and operative positions illustrated respectively in Fig. 7 and in Figs. 2 and 6.

An important feature of the invention resides in the arrangement of the machine in such a manner that washing and rinsing operations are carried out completely on one side of central partition 11 in the first compartment 12 and the sterilizing and drying operations are carried out in the second compartment 13 in order to entirely eliminate any possibility of contamination of the cans in the final stages with the wash and rinsing waters employed in the initial stages of the cleaning operation.

When a can is introduced into the machine, it is placed in inverted position on loading plate 70 from which position it is pulled into compartment 12 by means of dogs 71 which are pivoted to extension 72 of T-bars 18. In the first position of the can within compartment 12, the milk residue is allowed to drain out of the can. At subsequent stations the can is prerinsed, drained, washed and then allowed to drain again at the rotatable segments 50 and 53. The can then passes to the steaming and drying compartment 13. After the can has been dried it passes to the inverter units 16 and 16a where it is uprighted and deposited on the stationary bars 17. A trip bar 73 may be mounted on rocker shaft 30 in order to push the can outwardly of compartment 13 in position to receive its cleaned cover from the cover-cleaning upper compartment of the machine, as illustrated in Fig. 1. The various piping arrangements and supplemental equipment such as tanks, nozzles and the like for the water, steam and air supply are not described since they are old and well known.

As may be seen in Fig. 1, the can covers are moved along through the machine on a level above the cans on a track 75 which is provided with a plurality of notches 76 defining the cover stations. The covers are supported in a vertical position between the guide rails 77 with their annular flanges resting upon and rolling along the fixed can track 75. The linear movement of the covers through compartments 12 and 13 is accomplished by means of feeding dogs 78 which are pivotally mounted at 78a along a pair of oppositely reciprocating cover-feeding dog-bars 79 and 79a in compartments 12 and 13 respectively. Dog-bars 79 and 79a may be mounted on rollers 80 (see Fig. 8). Feeding dogs 78 are preferably counterweighted so as to normally assume their operative position of engagement against the annular flange of each cover and index the covers from station to station during the reciprocation of dog-bars 79 and 79a. Stops 81 limit the feeding dogs 78 to their upright operative position during the advancement strokes of the dog-bars 79 and 79a. During the retractive stroke of said dog-bars, the feeding dogs 78 swing freely about their pivots and pass under the covers which are maintained against rearward motion by being retained in the notches 76. At the termination of the retractive stroke of said dog-bars, feeding dogs 78 again return to their normal elevated operative position, illustrated in Fig. 5, as a result of their being counterweighted.

In order to convey the covers around the return bend of cover track 75 at the closed end of the machine a rotary element 85, comprising a pair of radial arms 85a mounted on a hub portion 85b (see Fig. 8), is fixed to the upper end of shaft 52 which, as has been previously described, carries the can-turning segments 50 and 53. Each of the radial arms 85a carries at its outer end a pivoted feeding dog 86 which operates in a manner similar to that described for the feeding dogs 78 but which in the present instance operates to convey the covers around the return bend of can track 75, as seen in Fig. 4. It will be remembered that vertical shaft 52 oscillates with the cam-turning segments 50 and 53 simultaneously with the reciprocation of T-bars 18 and 19. Thus shaft 52 in turn actuates the cover-turning unit 85. Furthermore the cover-indexing dog-bars 79 and 79a are reciprocated by connection with cover-turning unit 85, as best shown in Fig. 4. For this purpose a linkage 87 connects dog-bar 79 with one of the radial arms 85a of unit 85 and another linkage 88 connects an extension 85c of unit 85 with an arm 89 fixed to dog-bar 79a. In this manner dog-bars 79 and 79a are caused to reciprocate in opposite directions simultaneously with the advancement and retraction of cover-turning unit 85.

Referring to Fig. 4, it will be seen that the final station on the return bend portion of cover track 75 anterior to compartment 13 requires a partly arcuate and a partly linear feeding motion in order to advance a cover into the first linear notch 76 in compartment 13. For this purpose an extension 90 is hingedly connected to the rear end of dog-bar 79a and said extension carries a pivoted feeding dog 91 which operates to advance the covers from the return-bend portion

of cover track 75 and into the second compartment 13. The construction and mounting of feeding dog 91 is similar to that for the feeding dogs 78 carried by radial arm 85a.

As has been previously pointed out the cans are introduced into the machine by being placed in inverted position on loading plate 70 anterior to first compartment 12. The mating cover for a particular can is simultaneously placed in the cover chute 95 which is preferably provided with a downwardly inclined bottom wall 96 in order to cause the covers to roll toward the mouth of the cover chute preparatory to being disposed on the cover track 75. The cover feeding arrangement assures that a mating cover for a particular can will be fed onto the cover track 75 only when the can enters first compartment 12. For this purpose, the covers are temporarily held at the mouth of cover chute 95 by means of a retaining member or bail 97 pivoted to said chute at 98 and adapted to engage the edge of the cover which projects from the mouth of the chute, as shown in Figs. 4 and 5. The bottom of cover chute 95 is provided with a deflector plate 99 mounted on a member 100 which is pivoted to the chute at 101. By reason of the described arrangement deflector plate 99 is normally disposed above the first feeding dog 78 of dog-bar 79 and retains said feeding dog in inoperative position, as shown in Fig. 5. However, when a can is fed into the machine, plate 99 is laterally deflected thereby allowing the mating cover for the can to be engaged by the first feeding dog 78. In this manner, the feeding of the cans and their respective mating covers is correlated so that the same mated cans and covers are discharged from the machine that were initially fed into the machine.

Referring now to Figs. 1 and 4, the covers are discharged into a delivery chute 105 down which each cover slides by gravity to its respective uprighted can on which the cover is retained in a tilted position. An auxiliary chute 106 is pivotally mounted on the frame of the machine at 107 and is arranged to be alternately elevated and lowered so as to allow the can being discharged from the machine to pass unobstructedly thereunder into the dotted outline position of Fig. 1 but also to insure subsequent positive feeding of the cover onto the mouth of the can. For this purpose, a rocker arm 108 having an elongated slot 109 engaging a lateral pin 110 of chute 106 is connected to rocker shaft 30 by means of a linkage 111.

Since certain modifications may be made in the machine of the present invention without departing from the scope thereof, it is intended that all matter contained in the foregoing description and shown in the accompanying drawing be interpreted merely as illustrative and not in a limiting sense.

I claim:

1. A machine for continuously cleaning receptacles which are open at one end and closed at the other end, said machine being open at one end for the reception and delivery of receptacles thereat, said machine having a central longitudinal partition defining a first washing compartment and a second sterilizing and drying compartment on the other side thereof, supporting elements for the receptacles extending in a linear direction within said first compartment and extending in a reverse linear direction within said second compartment toward the open end of the machine, said supporting elements having an arcuate return-bend portion interconnecting the linear portions thereof, a plurality of treating stations spaced along said supporting elements, first main intermittently operating feeding means within said first compartment, second main intermittently operating feeding means within said second compartment, said first and second feeding means being arranged to reciprocate simultaneously in opposite directions and being operative to feed said receptacles from station to station within said first and second compartments along the linear portions of said supporting elements, said first and second feeding means having opposed pairs of feeding dogs pivotally mounted thereon, longitudinally extending dog-bars pivotally interconnecting the outer ends of said feeding dogs, fixed stops arranged to abut respective dog-bars at the termination of the advancement and retraction of said first and second feeding means and operative to move said feeding dogs to open inoperative position and closed operative position respectively, and auxiliary rotary feeding means actuated by one of said main feeding means and operative to feed the receptacles along the arcuate portion of said supporting elements, said auxiliary rotary feeding means comprising inner and outer segments rotatable in unison, said inner and outer segments having opposed pairs of feeding dogs pivotally mounted thereon, arcuate dog-bars pivotally interconnecting the outer ends of said last-mentioned feeding dogs, fixed stops arranged to abut respective arcuate dog-bars at the termination of the advancement and retraction of said rotary feeding means and operative to move said last-mentioned feeding dogs to open inoperative position and closed operative position respectively in synchronization with the opening and closing of the feeding dogs of said first and second main feeding means.

2. A machine for continuously cleaning receptacles which are open at one end and closed at the other end, said machine being open at one end for the reception and delivery of receptacles thereat, said machine having a central partition defining a first washing compartment and a second sterilizing and drying compartment on the other side thereof, supporting elements for the receptacles extending in a linear direction within said first compartment and extending in a reverse linear direction within said second compartment toward the open end of the machine, said supporting elements having an arcuate return-bend portion interconnecting the linear portions thereof, a plurality of treating stations spaced along said supporting elements, first main intermittently operating feeding means within said first compartment, second main intermittently operating feeding means within said second compartment, said first and second feeding means being arranged to reciprocate simultaneously in opposite directions and being operative to feed said receptacles from station to station within said first and second compartments along the linear portions of said supporting elements, said first and second feeding means having opposed pairs of feeding dogs pivotally mounted thereon, longitudinally extending dog-bars pivotally interconnecting the outer ends of said feeding dogs, fixed stops arranged to abut respective dog-bars at the termination of the advancement and retraction of said first and second feeding means and operative to move said feeding dogs to open inoperative position and closed operative position respectively, and auxiliary rotary feeding means

actuated by one of said main feeding means and operative to feed the receptacles along the arcuate portion of said supporting elements, said machine also having a cover-supporting track extending therethrough substantially parallel to and on a higher level than said receptacle-supporting element, said cover track having a plurality of notches adapted to receive the annular flanges of the receptacle covers and defining cover-treating stations along said cover track, first main intermittently operating cover-feeding means within said first compartment, second main intermittently operating cover-feeding means within said second compartment, said first and second cover-feeding means being arranged to reciprocate simultaneously in opposite directions, said cover track having an arcuate portion disposed at the closed end of the machine between said first and second compartments and rotary cover-feeding means operative to feed the receptacle covers along the arcuate portion of said cover track, said auxiliary rotary receptacle-feeding means comprising inner and outer segments rotatable in unison, said inner and outer segments having opposed pairs of feeding dogs pivotally interconnecting the outer ends of said last-mentioned feeding dogs, fixed stops arranged to abut respective arcuate dog-bars at the termination of the advancement and retraction of said rotary receptacle-feeding means and operative to move said last mentioned feeding dogs to open inoperative position and closed operative position respectively in synchronization with the opening and closing of the feeding dogs of said first and second main feeding means.

3. A machine for continuously cleaning receptacles which are open at one end and closed at the other end, said machine being open at one end for the reception and delivery of receptacles thereat, said machine having a central longitudinal partition defining a first washing compartment and a second sterilizing and drying compartment on the other side thereof, supporting elements for the receptacles extending in a linear direction within said first compartment and extending in a reverse linear direction within said second compartment toward the open end of the machine, said supporting elements having an arcuate return-bend portion interconnecting the linear portions thereof, a plurality of treating stations spaced along said supporting elements, first main intermittently operating feeding means within said first compartment, second main intermittently operating feeding means within said second compartment, said first and second feeding means being arranged to reciprocate simultaneously in opposite directions and being operative to feed said receptacles from station to station within said first and second compartments along the linear portions of said supporting elements, said first and second feeding means having opposed pairs of feeding dogs pivotally mounted thereon, longitudinally extending dog-bars pivotally interconnecting the outer ends of said feeding dogs, fixed stops arranged to abut respective dog-bars at the termination of the advancement and retraction of said first and second feeding means and operative to move said feeding dogs to open inoperative position and closed operative position respectively, and auxiliary rotary feeding means actuated by one of said main feeding means and operative to feed the receptacles along the arcuate portion of said supporting elements, said machine also having a cover-supporting track extending therethrough substantially parallel to and on a higher level than said receptacle-supporting element, said cover track having a plurality of notches adapted to receive the annular flanges of the receptacle covers and defining cover-treating stations along said cover track, first main intermittently operating cover-feeding means within said first compartment, second main intermittently operating cover-feeding means within said second compartment, said first and second cover-feeding means being arranged to reciprocate simultaneously in opposite directions, said cover track having an arcuate portion disposed at the closed end of the machine between said first and second compartments and rotary cover-feeding means operative to feed the receptacle covers along the arcuate portion of said cover track, said rotary cover-feeding means comprising radially extending arms terminating adjacent the arcuate portion of said cover track, said arms carrying at their outer ends pivotally mounted counterweighted cover-feeding dogs adapted to swing under the annular flanges of the covers in inoperative position during the retractive stroke of said rotary cover-feeding means.

4. A machine for continuously cleaning receptacles which are open at one end and closed at the other end, said machine being open at the front end for the reception and delivery of receptacles thereat, supporting elements for the receptacles which are disposed in a first linear section which extends longitudinally rearwardly from said front end, a second linear section which extends longitudinally reversely to said front end, and an arcuate return bend section which connects the end of said first section to the beginning of said second section, a plurality of treating stations spaced along said supporting elements, first and second intermittently operating feeding means which are arranged to reciprocate simultaneously in opposite directions and which are operative to feed said receptacles from station to station respectively along said first and second sections in opposite directions, and auxiliary rotary feeding means actuated by one of said main feeding means and operative to feed the receptacles along the arcuate section of said supporting elements, said auxiliary feeding means comprising inner and outer segments rotatable in unison, said inner and outer segments having opposed pairs of feeding dogs pivotally mounted thereon, arcuate dog-bars pivotally interconnecting the outer ends of said last-mentioned feeding dogs, fixed stops arranged to abut respective arcuate dog-bars at the termination of the advancement and retraction of said rotary feeding means and operative to move said last-mentioned feeding dogs to open inoperative position and closed operative position respectively in synchronization with the intermittent operation of said first and second feeding means.

HAROLD M. KENDALL.

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