

CAN WASHING MACHINE.



Fig. 1.



Fig. 5.

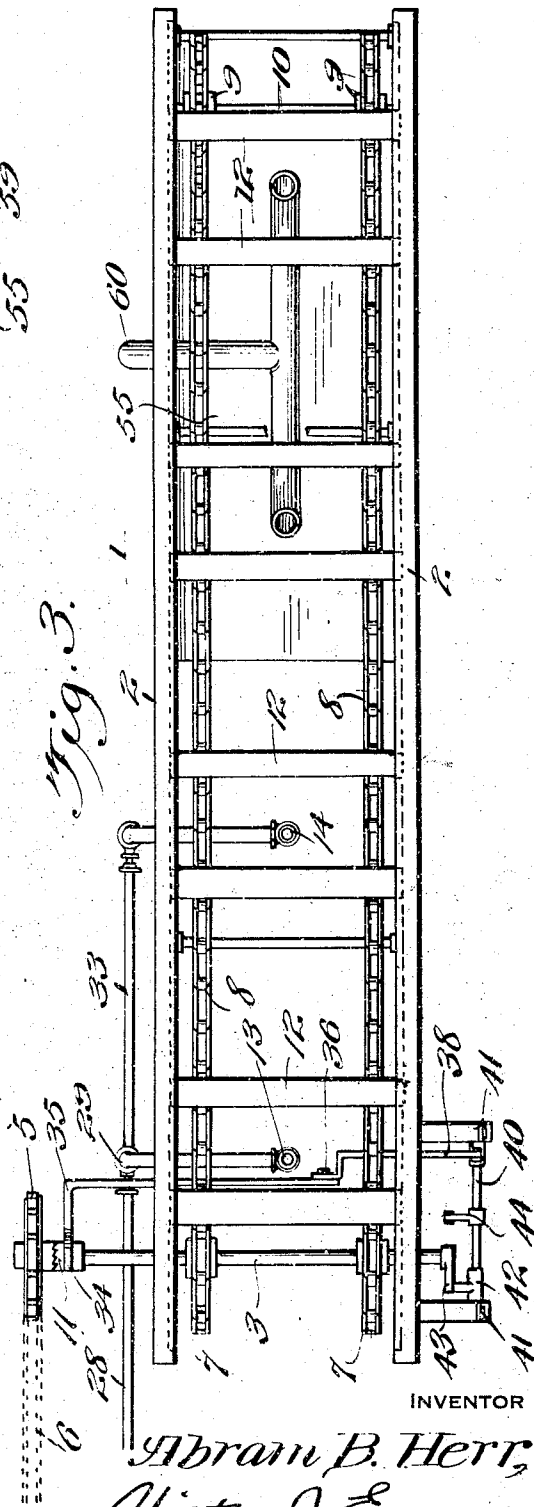
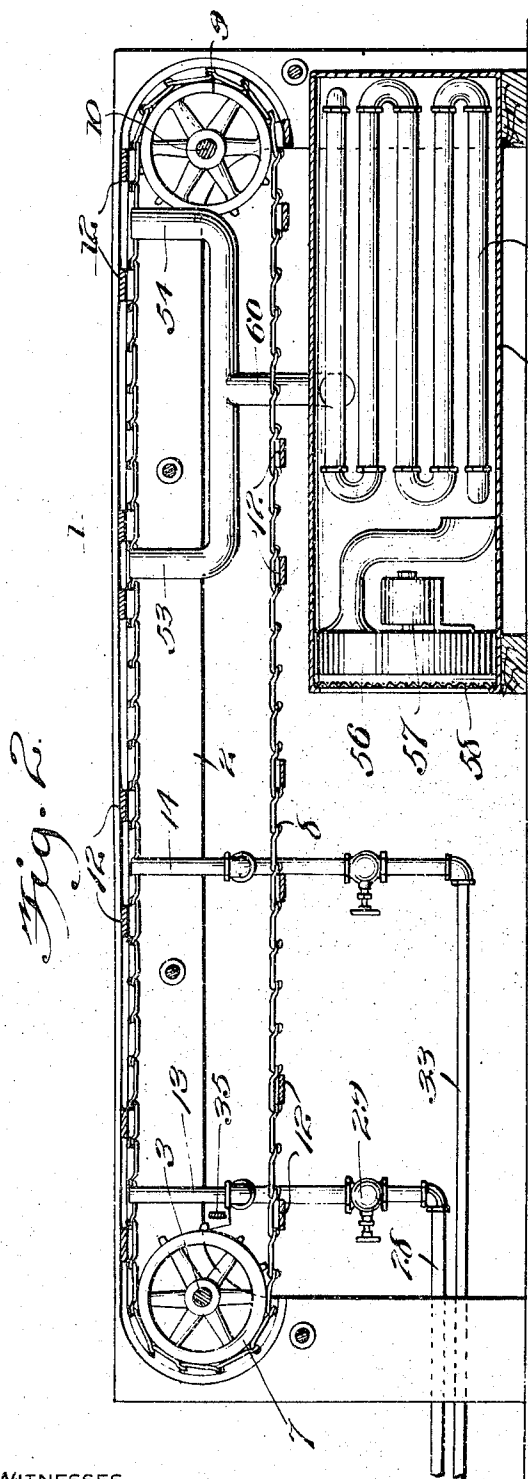
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1,280,731.

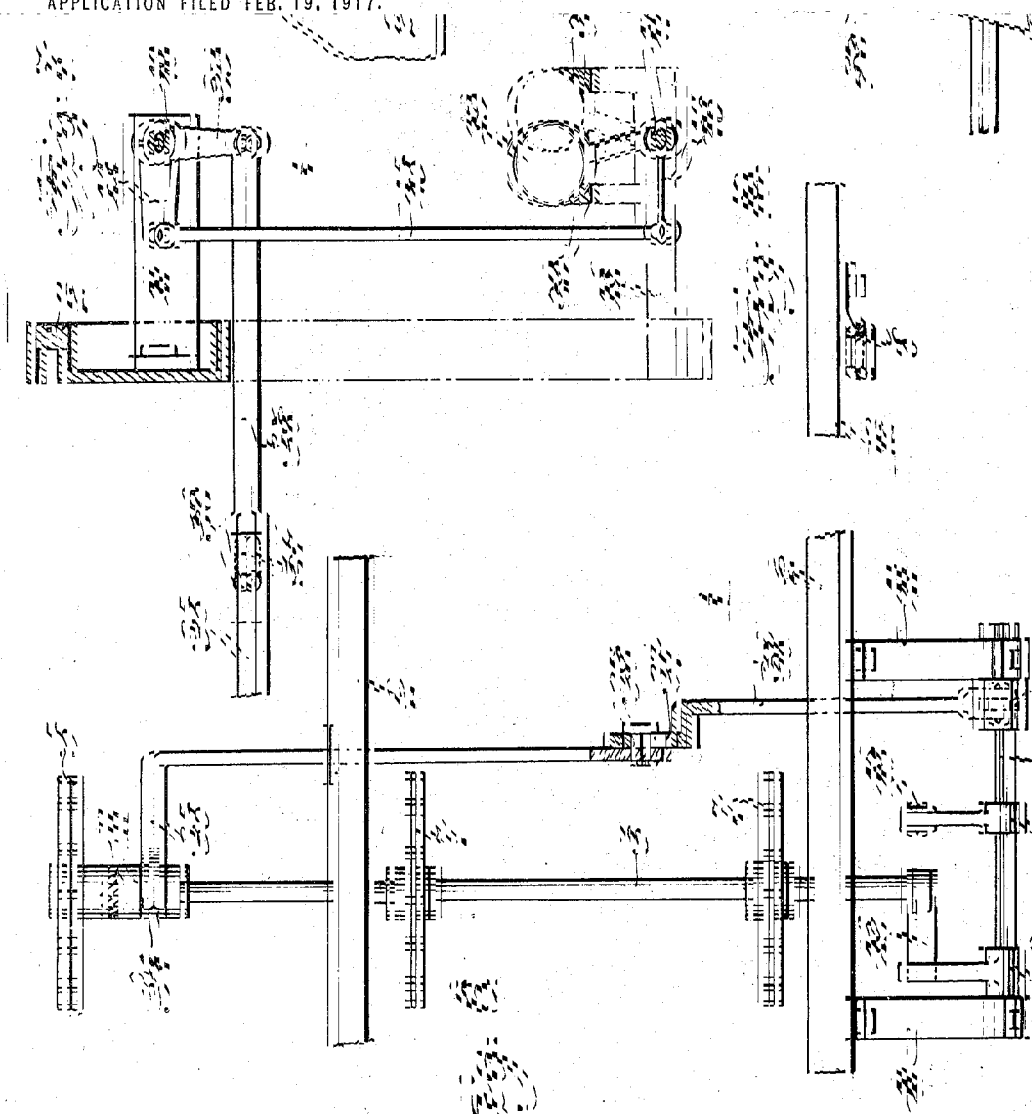
Patented Oct. 8, 1918.
3 SHEETS—SHEET 2.



WITNESSES
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CAN WASHING MACHINE.
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WITNESSES

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UNITED STATES PATENT OFFICE.

ABRAM B. HERR, OF LANCASTER, PENNSYLVANIA, ASSIGNOR TO SANITARY CAN WASHER CO., OF LANCASTER, PENNSYLVANIA, A CORPORATION OF DELAWARE.

CAN-WASHING MACHINE.

1,280,731.

Specification of Letters Patent.

Patented Oct. 8, 1918.

Application filed February 19, 1917. Serial No. 149,522.

To all whom it may concern:

Be it known that ABRAM B. HERR, a citizen of United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented new and useful Improvements in Can-Washing Machines, of which the following is a specification.

This invention relates to can washing machines, and more particularly to means for rinsing, sterilizing and drying cans which have previously passed through a preliminary cleansing or scrubbing operation. The machine is particularly adapted for use in washing milk cans and the like, and the invention has for an object to provide a conveyer that will periodically advance the cans or other receptacles over suitable devices, which in turn further clean or wash, sterilize and dry the cans or receptacles. In the art of can-washing, and in the adaptation of any character of machinery to the scrubbing, washing, sterilizing and drying of receptacles, such as milk cans, it is necessary, particularly in view of existing laws and regulations governing the cleanliness of milk cans, that the cans be thoroughly cleaned and sterilized so that when they subsequently receive their contents, the same will not become contaminated in any manner whatsoever by foreign matter contained in the cans, which latter would also tend to spoil or sour milk or other fluids or substances, subsequently placed in the cans. In connection with various can-washing machinery that I have invented and am acquainted with, I find that the washing of the cans is accomplished with such speed and precision, that it is necessary to have some form of machinery arranged in juxtaposition to the can-scrubbing machinery, whereby the scrubbed can can be subjected to a jet of hot water to thoroughly clean the interior of the can after it has been scrubbed, and act as a rinsing fluid therefor, after which the can is subjected to sterilization by steam, and then thoroughly dried, so that the cleaned, sanitary, sterilized can will be fit for use in the shortest possible time, after it has been subjected to the scrubbing, sterilizing and drying operations, and to this end I find it policy to provide a mechanism which will take care of several cans at one time, subjecting various of the cans to the rinsing, sterilizing and drying operations, while another of the cans is being scrubbed preparatory to following out subsequently

the same proceeding of being rinsed, sterilized and dried.

With this aim in view I have devised a machine embodying a suitable conveyer, upon which a can is deposited after it has been scrubbed, and upon which the can rests while a second can is being scrubbed, the first can being periodically subjected to the rinsing operation and the sterilizing operation, so that when the can passes the sterilizing operation, the conveyer is ready to receive the second can that has been scrubbed, in position to rinse the same, the conveyer furthermore being ready to receive the third can that has been scrubbed, when the first can has been advanced to drying position, and the second can advanced to sterilizing position, the place of rinsing of the last can to be scrubbed being now ready to receive that can, so that a fourth can can be arranged in the scrubbing machinery, while the other three cans are being either rinsed, sterilized or dried.

In the further disclosure of the invention reference is to be had to the accompanying drawings constituting a part of this specification, in which similar characters of reference denote corresponding parts in all the views, and in which

Figure 1 is a side elevation of the conveyer mechanism, illustrating the same as employed in connection with milk can scrubbing mechanism.

Fig. 2 is a vertical longitudinal sectional view taken through the conveyer mechanism and its cooperating drying elements.

Fig. 3 is a top plan view of the conveyer.

Fig. 4 is a transverse sectional view taken along the line 4—4 of Fig. 1.

Fig. 5 is a detail view of the fluid-supplying mechanism.

Fig. 6 is a detail top plan view of the clutch structure for controlling the application of power to the conveyer.

Fig. 7 is a transverse sectional view taken along the line 7—7 of Fig. 6.

The remaining figures are detail views of the conveyer.

Referring more particularly to the drawing, the conveying mechanism 1, is preferably employed to clean, sterilize and to dry milk cans, and is particularly adapted for use in connection with the can-washing machine set forth in my co-pending application bearing Serial No. 43,540 filed August

4, 1915. The conveyer in this instance consists of metallic, spaced bed plates 2, having journaled, contiguous to its forward end, a shaft 3, the latter being journaled in bearings 4 provided in the plates. The outer end of the shaft 3 has loosely mounted thereon a sprocket wheel 5, or an equivalent, and a chain 6 is trained over said sprocket and extends to a suitable source of power, not shown, so that during the operation of the conveyer the sprocket 5 will be continuously rotated. Other sprockets 7 are keyed to the shaft 3 and are located inside of the plates 2, and passing over the latter sprockets are spaced endless chains 8, the latter also being trained over similar sprockets 9, journaled for rotation upon a shaft 10 carried by the rear ends of the plates 2.

In order that the movement of the sprocket 5 will be transmitted to the shaft 3, the latter is provided with a sliding clutch sleeve 11, which while capable of rotating in connection with the shaft, will be permitted to slide longitudinally thereon, as will be clearly understood. The sleeve 11 and the hub of the sprocket 5 are provided with interlocking clutch teeth, so that when the latter are in engagement, the movement of the sprocket 5 will be imparted to the shaft 3. Secured to the links of the chains 8 are a plurality of spaced cleats 12, arranged in pairs, said cleats being adapted to travel in unison with the chain 8, and so constructed that the ends thereof will rest upon and slide over the upper edges of the plates 2.

Coöperating with the mechanism above described are cleaning and sterilizing jets, 13 and 14 respectively, the latter being preferably positioned between the plates 2, adjacent to the forward portions of the latter, and terminating immediately beneath the upper margins of the conveyer belt or chains 8. Thus it will be seen, upon referring to Fig. 1, that when the milk cans 15 are positioned upon the conveyer belt, the same will be positioned, by mechanism to be hereinafter described, immediately above the jets 13 and 14, so that the fluid ejections of the latter will be forced into the interior of the cans 15, under pressure, so as to effectively remove any foreign matter or other objectionable matter which may be found within said cans.

In order to supply fluid to the jet 13, I preferably use a water-supply tank 16, which is filled to a predetermined level. The quantity of water within the tank 16 is controlled by providing the water entrance pipe 17 thereof with a valve 18, the latter being located interiorly of the tank 16, and having the arm 19 thereof connected with the ball float 20, so that when the float arrives at a certain position within the tank 16, the supply of water to the latter will be automatically shut off. An outlet pipe 21

extends from the tank 16 and is provided with a check-valve 22, which will permit water to flow out of the tank, but prevents a similar return of the same even when under the influence of pressure.

It will be noted that the upper end of the jet 13 is disposed substantially in alinement with the water level of the tank 16, therefore, in order to force water out of the jet 13 under pressure, use is made of a steam-supply pipe 23, having a controlling valve 24 carried thereby. Thus when the can brushing and scrubbing machine 25 is thrown into operation by the action of its controlling lever 26, the valve 24 will be revolved to assume an open position, through the agency of the link 27. This action, as will be obvious, places steam pressure upon the water contained within the jet 13 and its associated pipes 28, leading to the tank 16, so that water or any other cleansing fluid will be ejected from the jet 13 and forced with considerable pressure into the milk cans supported by the conveyer belt. The pressure of the water when leaving the jet 13 may be regulated by the hand-operated valve 29 carried by said jet. It will be noted that the check valve 22 will prevent the water contained within the pipes 28 from being forced back into the tank 16. When the controlling lever 26 is in the position indicated by Fig. 1, the gears 30 utilized in effecting the operation of the brushes 31 are in mesh, so that the operation of the jet 13 and the mechanism 25 will be synchronized. The jet 14 is merely supplied with steam, and this is effected by providing the steam supply pipe with a T 32, from which extends a pipe 33 leading to the jet 14. Thus when the valve 24 assumes an open position, the jets 13 and 14 will be simultaneously operated, that is, the jet 13 will supply the cans 15 with a quantity of water, under pressure, while the jet 14 will emit a suitable quantity of steam so as to sterilize the interior of said cans.

The cans 15 are moved intermittently to various positions by the conveyer belt, for instance, from the jet 13 to the jet 14, and in order to accomplish this the clutch sleeve 11 is formed with an annular groove 34. Positioned within said groove is the forked extremity of a clutch operating arm 35, the latter being slidably mounted in bearings provided by the plates 2. A bolt or an equivalent 36 is secured to the free end of the arm 35 and operates within an elongated slot 37 provided in one extremity of a link 38. The opposite end of said link is pivotally connected with the outer end of a crank 39 keyed upon a countershaft 40, rotatably mounted in fixed bearings 41 protruding from one of the plates 2. The shaft 40 also carries a second fixed crank arm 42, which extends inwardly and is disposed

within the path of travel of a cam element 43, secured to one extremity of the shaft 3. From the foregoing it will be seen that when the shaft 3 makes a complete revolution, which is sufficient to enable a can 15 to be conducted from the jet 13 to the jet 14, the cam 43 will contact with the arm 42, so as to revolve the countershaft 40, which in turn will reciprocate the link 38 and the arm 35 so as to disengage the clutch sleeve 11 with the ratchet teeth formed on the hub of the sprocket 5, thus automatically effecting the stopping of the conveyer belt at predetermined positions. This action is enhanced by providing the countershaft with a third crank arm 44 from which extends a vertical link 45, the latter leading to a bell crank lever 46 carried upon a shaft 47, journaled in fixed bearings 48 preferably carried by the plate 2. One end of the bell crank 46 is provided with a weight 49 which is adapted to oscillate between fixed points 50 provided by one of the bearings 48. Thus it will be manifest that when the shaft 40 is revolved by the action of the cam element 43 engaging with the crank arm 42, the weighted bell crank 46 will revolve from the position indicated in Fig. 7 to engagement with one of the fixed positions 50. The slot 37 provided in the link 38 will permit the weighted end of the bell crank to assume a substantially vertical position, with respect to the shaft 47, before the action of the bell crank will reciprocate the arm 35 and the link 38, however, as soon as the bell crank has passed this vertical position the latter elements, which have remained inactive through the provision of the slot 37, will be sharply and quickly pulled, so as to effect the disengagement of the clutch sleeve 11 with the sprocket 5, which results in the immediate stop of the conveyer belt. In order that the conveyer belt will be in a state of operation, transferring the milk cans from one operating position to another, when the brushing mechanism 25 is inactive, the shaft 47 is extended so as to lie contiguous to the lower end of the controlling lever 26. The latter is provided with an offset member 51 which is adapted to engage with a crank arm 52 provided near the extreme outer end of the shaft 47, when said lever 26 is oscillated to a position throwing the mechanism 25 to an inactive position. Thus the engagement of the members 51 and 52 will result in the partial rotation of the shaft 47 which will throw the weighted bell crank from its "out of gear" position to an "in gear" position. This action results in the interlocking of the clutch sleeve 11 with the sprocket 5 so that movement will be imparted to the conveyer belt. The means for automatically stopping the movement of the conveyer belt have been above described. From the fore-

going it will be gathered that when the brushing machine 25 has been thrown into operation, through the medium of the lever 26, the milk cans carried by the conveyer will be subjected to a cleaning operation, effected through the action of the jets 13 and 14, which are controlled by the relation existing between the lever 26 and the valve 24. When the brushing machine is inactive the conveyer belt will be thrown into a state of movement, which is principally effected by the action of the lever 26 upon the crank member 52, as will be clearly understood. It might be advisable to state at this juncture that when a can has been scrubbed by the mechanism 25, the same is removed from the latter and manually transferred to the position upon a conveyer, substantially over the jet 13, this is practically the only manual operation that is necessary to effect the successful operation of the conveyer, other than the manipulation of the lever 26.

After the milk cans have been subjected to the action of the jets 13 and 14, the same are moved by the operation of the conveyer belt to positions over a plurality of heating jets 53, so that the interior of the cans will be thoroughly dried before leaving the conveyer. To this end, use is made of a casing 55, located adjacent to the under and rear portions of the plates 2. Mounted within the casing is a suitable form of suction fan 56 which is preferably operated through the agency of an electrical motor 57. Thus air drawn through a foraminous screen 58 will be forced by means of the fan 56 into the interior of the casing 55. Coils 59 are mounted within the casing 55 and are preferably heated by passing steam, obtained from any suitable source, therethrough. Thus air directed upon the coils by the action of the fan 56 will be thoroughly heated, whence the same will be discharged from the casing into an outlet pipe 60, which is branched to provide the heating jets 53 and 54. Usually heat is being emitted by the latter jets while the conveyer is in operation, as so far it has not been found advisable to intermittently control the flow of the heating fluid out of the jets 53 and 54. It will be noted that the jets 13, 14, 53, and 54 are equally spaced, so that the intermittent travel of the milk cans along the conveyer may be easily regulated.

From the foregoing it will be evident that there is provided a machine through the use of which the objects of the invention have been achieved, and that all of the advantageous features above mentioned are, among others, present. The machine will thoroughly effect the washing, sterilizing and drying of the milk cans to the desired degree of immaculate cleanliness, so as to conform to the most stringent of existing laws and regulations governing this feature.

The water utilized can be heated to a much higher temperature than when manual labor is to be employed in the washing operation and the conveyer belt permits the cans to be
 5 operated upon so that they may be subjected successively to rinsing and to sterilization and then to a blast of air for drying purposes. The automatic features permit of control through the agency of a single man-
 10 ually operated lever. The machine can be economically manufactured, and is particularly adapted for use in large dairies or in similar places, where a large number of cans have to be daily washed.

15 Having described my invention I claim:

1. A device of the character described, comprising a can-receiving and supporting conveyer belt, a frame carrying said belt, means for operating said conveyer belt upon
 20 said frame, said cans being inverted upon the conveyer belt, and advanced therewith in its operation, a jet of rinsing water on the frame in juxtaposition to the conveyer belt, a jet of steam on the frame in juxtaposition to the conveyer belt, and a hot air
 25 jet on the frame in juxtaposition to the conveyer belt, the cans on the conveyer belt being in turn subjected to the action of fluid from the rinsing jet, of sterilizing steam from the steam jet, and of hot air
 30 from the hot air jet, the latter operation drying said cans, means for starting and stopping the conveyer belt, and means connected therewith for admitting steam to the steam jet and simultaneously placing
 35 the rinsing water under steam pressure, rotating brush mechanism, and means whereby the latter is thrown into operation when the movement of the conveyer is discontinued.
 40

2. A device of the class described, comprising a frame and conveyer belt thereon adapted to receive cans, means for operating the conveyer belt to advance the cans over
 45 the frame, a rinsing jet on the frame in juxtaposition to the conveyer belt for rinsing a can received in super-position to the jet, a steam jet on the frame in juxtaposition to the conveyer belt to sterilize the can received
 50 in super-position to the steam jet, and a hot air jet on the frame in juxtaposition to the conveyer belt to subject a can received in super-position thereto to the action of hot air to dry the interior of the can, means for
 55 starting and stopping the conveyer belt, and means connected therewith for admitting steam to the steam jet and simultaneously placing the rinsing water under steam pressure, rotating brush mechanism, and means
 60 whereby the latter is thrown into operation when the movement of the conveyer is discontinued.

3. A device of the class described, comprising a frame and conveyer belt thereon
 65 adapted to receive cans, means for operating

the conveyer belt to advance the cans over the frame, a rinsing jet on the frame in juxtaposition to the conveyer belt for rinsing a can received in superposition to the jet, a steam jet on the frame in juxtaposition to
 70 the conveyer belt to sterilize the can received in super-position to the steam jet, and a hot air jet on the frame in juxtaposition to the conveyer belt to subject a can received in super-position thereto to the action of hot
 75 air to dry the interior of the can, the cans being intermittently advanced in succession from said rinsing jet, steam jet and hot air jet, means for starting and stopping the conveyer belt, and means connected there-
 80 with for admitting steam to the steam jet and simultaneously placing the rinsing water under steam pressure, rotating brush mechanism, and means whereby the latter is thrown into operation when the movement
 85 of the conveyer is discontinued.

4. A device of the character described, comprising a frame, a can-supporting conveyer belt on the frame, a rinsing jet on the frame for subjecting the can to a rinsing,
 90 a steam jet on the frame for subjecting the can to sterilization, a hot air jet on the frame for drying the can, and means for starting and stopping the conveyer belt, a water tank and a pipe connected therewith and with the
 95 water jet, a steam main connected with the steam jet, means connecting said main with the water pipe for placing the water under pressure, a valve controlling simultaneously the admission of steam to the pipe and the
 100 main, and means for operating the valve and simultaneously controlling the means for starting and stopping the conveyer.

5. A device of the character described, the combination with a conveyer belt, of means
 105 for intermittently effecting the operation of said belt, whereby cans associated with said belt will be moved to different cleaning and drying positions; a rinsing water emitting jet cooperating with said conveyer belt, and
 110 located to aline with the open extremity of a milk can associated with said conveyer belt, a steam emitting jet spaced from the former jet, and having communication with the source of supply of the latter, means for
 115 starting and stopping the conveyer belt, a water tank and a pipe connected therewith and with the water jet, a steam main connected with the steam jet, means connecting said main with the water pipe for plac-
 120 ing the water under pressure, a valve controlling simultaneously the admission of steam to the pipe and the main, and means for opening the valve and simultaneously stopping the conveyer.
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6. A device of the character described, the combination with a conveyer belt, of spaced rinsing and sterilizing jets cooperating with said belt, means for supplying said jets with fluid, a valve controlling both of said jets,
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means for operating the valve and simultaneously stopping the conveyer, and means in the path of movement of the conveyer for supplying a continuous blast of hot air, said valve being opened upon the stopping of the conveyer.

7. A device of the character described, the combination with a conveyer belt, of spaced rinsing and sterilizing jets cooperating therewith, a valve for controlling the flow of fluid to said jets, a lever cooperating with said valve, a driving shaft for the conveyer, means for throwing the driving shaft into operation and for opening the valve in timed relation therewith, said valve being open when the conveyer is stationary and said means including a manually controlled and gravity controlled rock shaft.

8. In a device of the class described, a conveyer belt, a rotating brush, driving mechanism, a controlling lever, a plurality of fluid jets and pipes for supplying said jets, a single device controlling the admission of steam to one of the jets and water under steam pressure to the other of said jets, means whereby the controlling device is governed by the controlling lever, means whereby the movement of the conveyer is discontinued periodically, gravity controlled means for rendering such operation positive, and means for throwing the rotating brush into action when the lever is thrown to stop the conveyer.

In testimony whereof I affix my signature.

ABRAM B. HERR.