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APPARATUS FOR REMOVING LOOSE PARTICLES FROM THE INTERIOR OF CANS

Original Filed June 18, 1925

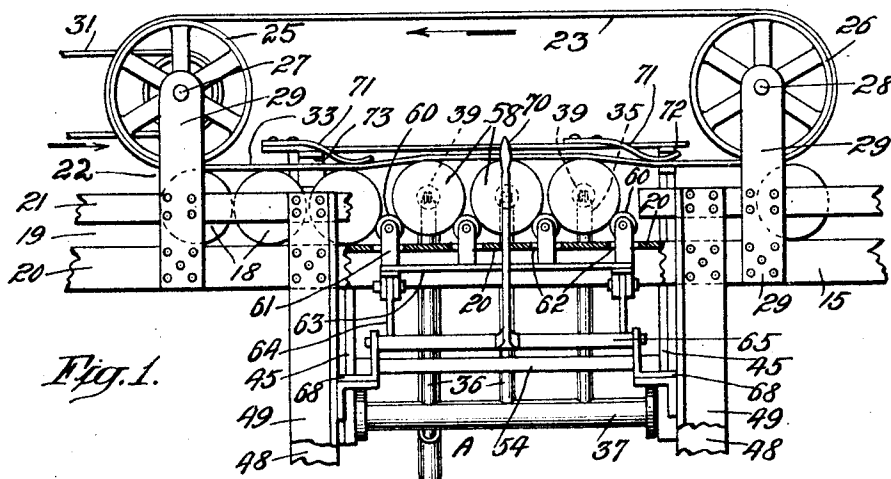


Fig. 1.

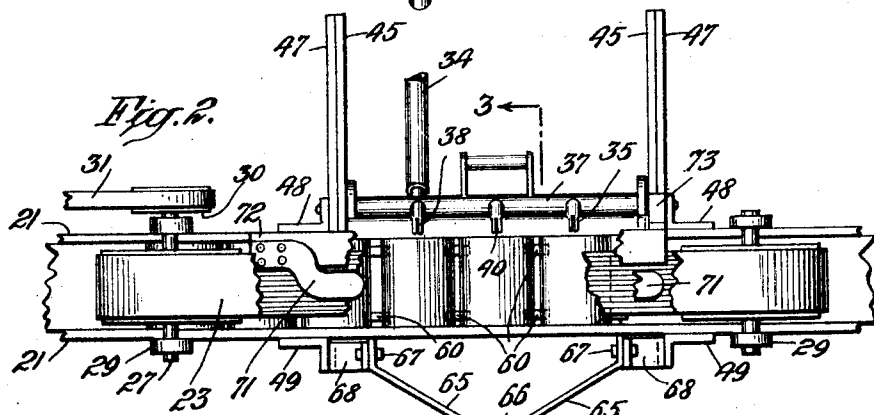


Fig. 2.

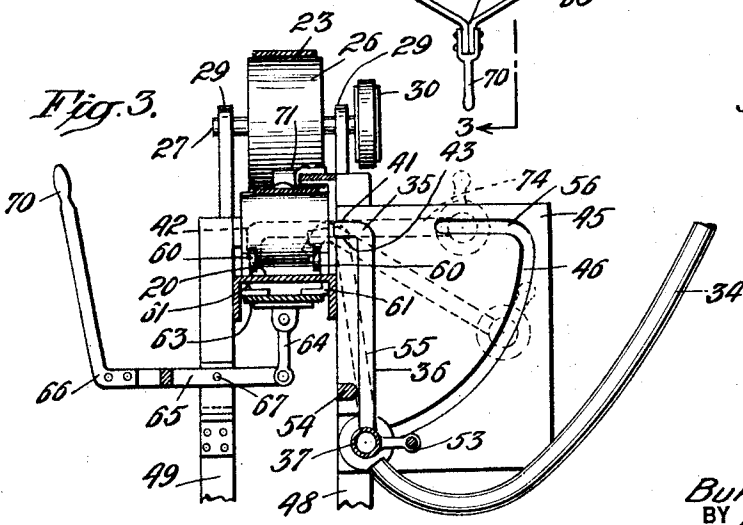


Fig. 3.

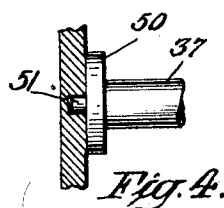


Fig. 4.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR REMOVING LOOSE PARTICLES FROM THE INTERIOR OF CANS.

Original application filed June 18, 1925, Serial No. 37,928. Divided and this application filed September 8, 1927. Serial No. 218,140.

The invention relates to an improvement in apparatus for removing loose particles from the interior of tin cans and more particularly from the inner surfaces thereof. The present application is a division of my copending application, Serial No. 37,928, filed June 18, 1925.

The invention has been developed in connection with preparing tin cans for receiving food products, that is, cleaning and sterilizing them before the food products are introduced into the cans and hermetically sealed therein. The object of the invention is to provide a device for expediently and efficiently removing loose particles from the interior of the cans, such as particles of dust and moisture, in order that the cans may be properly washed and dried prior to the sterilizing operation. To this end the invention consists in the improved apparatus hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings illustrating the preferred form of the invention Fig. 1 is a side elevation of the improved apparatus for removing loose particles from the interior of cans; Fig. 2 is a top plan of the parts shown in Fig. 1; Fig. 3 is a section taken on the line 3-3 of Fig. 2, and Fig. 4 is a detail of one end of the manifold of the vacuum device.

The apparatus as illustrated in the drawings is shown as occupying a portion of a can runway through which the cans 18 pass from the point of manufacture or storage to the point where they are sterilized or otherwise acted upon. The cans enter the left hand end of the runway (facing Fig. 1) and are discharged through the right hand end. The can runway is of usual construction and consists of the bottom plate 20 and the side rails 21. The cans may be fed into the portion of the runway shown in the drawings by feeding devices or by gravity. At the point 22 in the runway the cans are engaged by a belt 23 and advanced into position for the operation of removing any loose particles of dust or moisture from the interior of the cans. The belt 23 passes over the pulleys 25 and 26 mounted respectively on the shafts 27 and 28 journaled in the uprights 29 rising from the bottom wall 20 of the runway. On the rear end of the shaft 27 is mounted a pulley 30 over which passes a belt 31 which may be driven

from any convenient source of power. The cans are engaged by the lower section 33 of the belt 23 and rolled into position for the particle removing operation.

In the arrangement of the various devices shown in my said copending application for preparing tin cans to receive the food products, the apparatus of the present invention is shown and described as used for removing loose particles of dirt or dust from the inner surfaces of the cans prior to washing the inner surfaces of the cans with water, and is then used for removing the loose particles of moisture adhering to the inner surfaces of the cans so that the cans may enter a sterilizing chamber in a dry condition. It is thus seen that the present apparatus is equally well adapted for removing solid and liquid particles from the interior and more particularly from the inner surfaces of cans. The term "loose particles" is intended to indicate and cover this double function of the apparatus.

The improved apparatus comprises a series of three nozzles 35 mounted on the upper end of the conduit tubes 36 rising from a vacuum manifold 37. Each nozzle 35 is flattened laterally, as shown in Fig. 2, and is provided with a vertical slot 38 through which the dust and other loose particles in the horizontally arranged cans are sucked. The vacuum manifold 37 may be connected by means of the flexible tube 34 with an exhaust pump or other vacuum producing means (not shown). The cans to be cleansed may be of any preferred construction, the type shown operated upon by the apparatus comprises the usual cylindrical body having two circular ends. In the center of one of the ends is a relatively small opening 39 (Fig. 1) through which the preserved product is introduced into the can and which is afterwards closed by a sealing cap. By reason of this construction the nozzles 35 are offset forwardly from the conduit tubes 36, as shown in Figs. 2 and 3, so that when the nozzles are inserted in the cans the ends 40 thereof will come relatively close to the inner surfaces of the cylindrical portions of the cans so as thereby effectively to suck up the particles of dirt therefrom. The top and bottom sides of the laterally compressed forward end of the nozzles are straight as shown in Fig. 3, so that the top side 41 may be brought close to the bottom of the can as indi-

cated by the dotted line 42 in Fig. 3, and so that the bottom side 43 may be brought close to the inside surface of the top of the can.

The mechanism by which the nozzles 35 are inserted into the horizontally disposed cans comprises two vertically arranged cam plates 45 extending rearwardly from the body portion of the apparatus. Each cam plate 45 is supported against a vertically arranged plate 47 secured to one of the rear legs 48 which together with the front legs 49 support the apparatus. In each cam plate 45 is cut a cam groove 46 extending from the lower left hand corner of the cam plate, as shown in Fig. 3, to the upper right hand corner of the cam plate. Each end of the vacuum manifold 37 is closed by a disc 50 provided on its outer side with a trunnion 51 adapted to ride in its respective cam slot 46.

The nozzles 35 are inserted into the cans positioned opposite them by the operative grasping the handle 53 secured to and extending rearwardly from the manifold 37 and pulling outwardly and upwardly thereon. This causes the upright conduit tubes 36 to fulcrum, or pivot upon the longitudinally arranged bar 54 located above the manifold 37 and secured at its ends at the inner edges of the cam plates 45. The pivoting of the conduit tubes 36 upon the rod 54 causes the nozzles 35 to enter through the openings 39 in the tops of the cans as indicated by the dotted lines 55 in Fig. 3. The upper end 56 of the cam slot or groove 46 extends forwardly and horizontally toward the cans so as to permit the operative to impart a reciprocating motion to the nozzles 35 and thereby cause the nozzles 35 to pass over the entire interior surfaces of the rotating cans to assure that all the loose dust or particles of moisture are removed from the interior of the cans.

When the three next untreated cans have been advanced opposite the three nozzles 35 by means of the lower section 33 of the belt 23, these positions being indicated by the cans 58 in Fig. 1, the cans are caused to rotate in their respective positions without advancement while the nozzles are inserted into the cans for the dust or moisture removing operation. For this purpose a series of four pairs of rolls 60 are provided, equally spaced longitudinally from the nozzles 35. These rolls 60 are pivotally mounted on the upper ends of uprights 61 passing through openings 62 in the bottom plate 20 of the can runway 15. The uprights 61 are mounted on a longitudinally arranged plate 63 supported at each end by a link 64 connected with the inner ends of the arms 65 of a lever 66 pivoted at 67 in the brackets 68 secured to the inner sides of the legs 49. The lever 66 is provided with a handle 70. The pairs of rolls 60 are arranged to engage with the outer ends of the cylindrical portions of the cans.

By depressing the handle 70 the pairs of

rolls 60 are caused to rise, thereby lifting the three cans 58 from the bottom plate 20 of the can runway. The cans 58 are caused to rotate without linear motion. In order to assure an efficient driving engagement between the section 33 of the belt 23 and the cylindrical sides of the cans 58, two leaf springs 71 are provided which bear upon the upper surface of the section 33 of the belt 23. The springs 71 are supported from a longitudinally arranged plate 72 mounted on brackets 73 secured to the rear legs 48.

To recapitulate briefly the mode of operation of the apparatus:—When the next three succeeding cans have been advanced opposite the nozzles 35, the operative depresses the handle 70, thereby lifting the cans by means of the rolls 60 to permit the cans to rotate opposite the nozzles. Thereupon the handle 53 of the vacuum manifold is pulled outwardly and upwardly to cause the nozzles 35 to enter the cans through the central openings 39 therein. When the conduit pipes 36 are in a horizontal position, indicated by the dotted lines 74, the operative imparts a reciprocating motion to the nozzles which together with the rotative movement of the cans causes the slotted ends of the nozzles to pass in close proximity to all parts of the inner surfaces of the cans, thereby assuring a thorough removal of loose particles of dirt or moisture from the cans. After the cans have been thus cleansed or dried the operative reverses the movement of the handle 70 to depress the rolls 60 to permit cans to be ejected from the apparatus and the next three succeeding cans to be positioned over the rolls 60 and opposite the nozzles 35, whereupon the steps of the operation are repeated.

Having thus described the invention what I claim as new is:—

1. An apparatus for removing loose particles from the interior of tin cans and the like comprising, means for rotatively supporting the cans, means for rotating the cans, a nozzle arranged to be connected with a vacuumizing means, and means for inserting the nozzle into the cans.

2. An apparatus for removing loose particles from the interior of tin cans and the like comprising, a series of rolls spaced apart to rotatively support a series of tin cans, means for rotating the cans, a series of nozzles arranged to be connected with a vacuumizing means, and means for inserting the nozzles into the cans simultaneously.

3. An apparatus for removing loose particles from the interior of cans comprising, a series of rolls adapted to support a series of cans in horizontal position, a belt for feeding the cans over the rolls, means for lifting the rolls and cans against the belt to cause the cans to rotate without linear movement, a series of nozzles, a manifold arranged to be connected with a vacuumizing means on

which the nozzles are mounted, upright plates having cam grooves for directing the nozzles into the cans and for permitting a reciprocating movement of the nozzles in the
5 cans.

4. An apparatus for removing loose particles from the interior of tin cans and the like comprising, a series of rolls normally out of the path of travel of the cans, a belt for feeding the cans over the rolls, vertically reciprocatable means upon which the rolls are supported, means for lifting the rolls to force the cans against the belt to cause the cans to rotate without linear motion, a series of nozzles, a manifold arranged to be connected with a vacuumizing means on which the nozzles are mounted, and cam surfaces by which the nozzles are directed into the cans and which permit the nozzles to be reciprocated
10 within the cans.

5. An apparatus for removing loose particles from the interior of tin cans and the like comprising, a cam runway, a belt for advancing the cans along the runway, a series
25 of rolls normally positioned below the run-

way, vertically reciprocatable means on which the rolls are mounted, means for lifting the rolls to force the cans against the belt to cause them to rotate without linear motion, a series of nozzles normally in upright position having offset upper ends pointed toward the open ends of the cans, a manifold arranged to be connected with a vacuumizing means on which the nozzles are mounted, and upright plates having cam grooves in which the ends of the manifold are adapted to travel, said cam grooves being shaped to direct the offset ends of the nozzles into the cans and to permit a reciprocating movement of the nozzles within the cans.
30 35 40

6. An apparatus for removing loose particles from the interior of cans and the like comprising, means for supporting and rotating a can, a nozzle having an offset end adapted to be connected with a vacuumizing means, and means for supporting the nozzle so that the offset end thereof may be inserted into and reciprocated in the rotating can in close proximity with the interior surfaces thereof.
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