(No Model.) 2 Sheets—Sheet 1.

M. JENSEN.

CAN SOLDERING MACHINE.

No. 555,247. Patented Feb. 25, 1896.

Fig. 5. Fig. 6. Fig. 7.

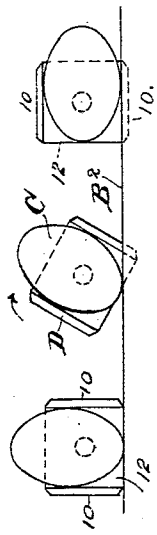

Fig. 1.

Witnesses:
J. L. Morse
F. F. Ascheck

Inventor,
Mathias Jensen
By Dewey & Co.
attys

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Fig. 2.

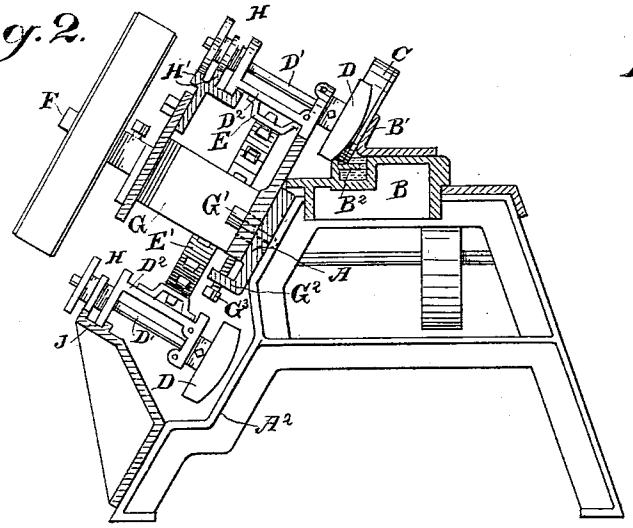


Fig. 4.

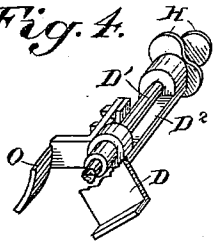


Fig. 9.

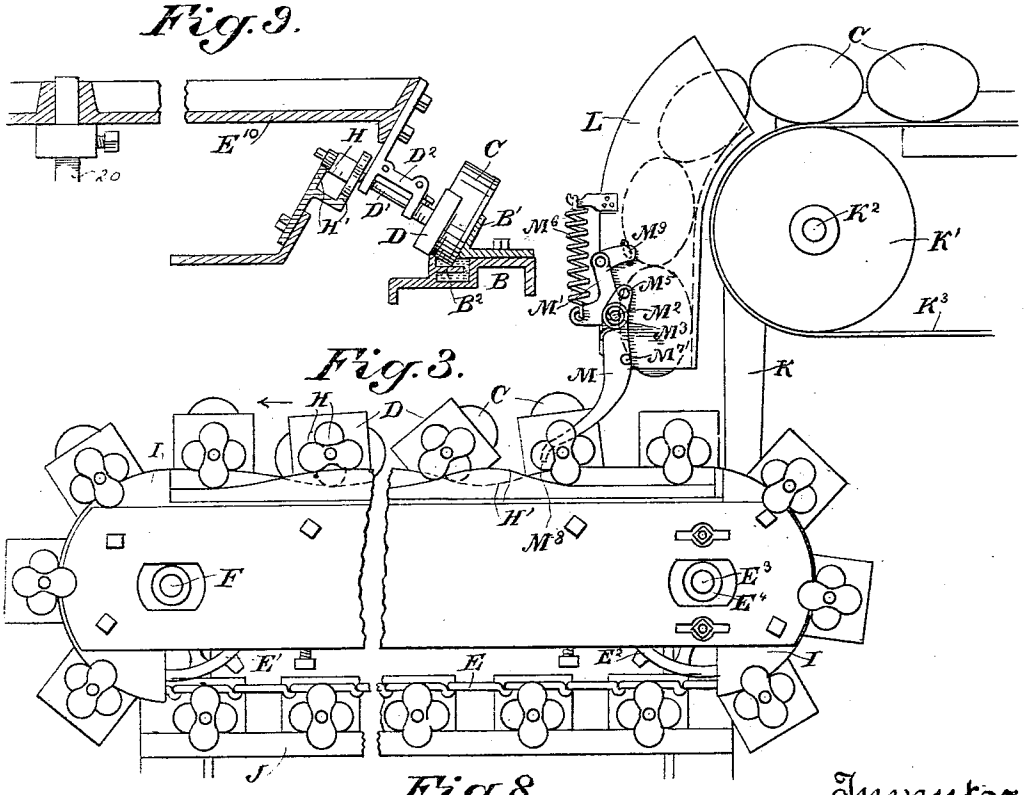
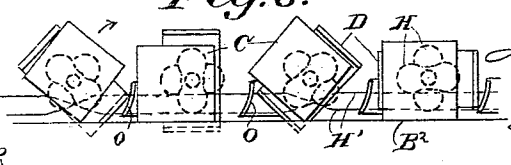


Fig. 3.

Fig. 8.



Witnesses,
L. Louise
J. F. Oscheck

Inventor
Mathias Jensen
By Dewey & Co.
Attys

UNITED STATES PATENT OFFICE.

MATHIAS JENSEN, OF ASTORIA, OREGON, ASSIGNOR OF ONE-HALF TO THE JENSEN CAN FILLING MACHINE COMPANY, OF SAME PLACE.

CAN-SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 555,247, dated February 25, 1896.

Application filed October 3, 1895. Serial No. 564,545. (No model.)

To all whom it may concern:

Be it known that I, MATHIAS JENSEN, a citizen of the United States, residing at Astoria, county of Clatsop, State of Oregon, have invented an Improvement in Can-Soldering Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in machines for soldering cans, and it is especially applicable to the soldering of the end seams of square, oval, and other shaped cans in a single machine.

It consists of a series of stalls adapted to receive and turn the cans so that the seams are dipped into the molten solder, the stalls being carried over the solder by a horizontally-moving carrier, and being so constructed that the cans are movable between the parallel sides of the stalls while being rolled on their largest diameter.

Referring to the accompanying drawings, Figure 1 is a side view. Fig. 2 is a transverse section on line $x\,x$ of Fig. 1. Fig. 3 is a rear side view. Fig. 4 is a detail of one of the carriers and the pusher. Figs. 5 to 8, inclusive, show different positions of oval and square cans while being rolled during the process of soldering. Fig. 9 is a modification showing the carrier moved by a horizontal wheel in place of an endless belt.

The apparatus consists of a frame A bolted to legs A' and A^2. Upon this frame is supported a soldering-trough B, and an angle-plate B' is bolted to the soldering-trough in such a position that the upturned edge serves as a guide against which one end of the cans abut while passing through the machine. A steel bar B^2 is fixed within the soldering-trough sufficiently submerged so that as the cans rest against the angle-plate B' the lower angle of the can will travel upon the submerged bar at such a depth that solder will be properly applied to the same as the can passes through the apparatus. The stalls D, which receive and roll the cans, are each fastened to one end of an axle D', these axles being journaled in a carrier D^2 at right angles with the face of the angle-plate B'. The stalls are preferably of essentially $\sqsubset$ shape in longitudinal section—that is, each stall has two opposing walls 10, an open front and a closed back 12, from which latter projects the axle about which the stall turns. The carriers D^2 are secured to an endless sprocket-chain E, which passes over two sprocket-wheels E' and E^2, one located at each end of the machine.

The sprocket-wheel E' is fastened to the driving-axle F, which is journaled in the support G, and the sprocket-wheel E^2 is loosely mounted upon the shaft E^3, which is fastened in a box E^4 clamped to the support G by two bolts which pass through oblong holes in the support and are threaded into the box, as shown in Fig. 3. The oblong holes allow adjustment for tightening or loosening the chain E.

The support G is clamped to the frame A by two bolts G', and these pass through vertical slots in the support and are threaded into the frame. The latter has two lugs G^2, which project with an angle beneath the support G, and a screw G^3 is threaded through each of said angular lugs, abutting against the support to prevent the latter from slipping downward. The oblong holes for the screws G' allow the support G, with the sprocket-wheel, chain-carriers, stalls, &c., to be raised or lowered on the incline of the frame A to accommodate different diameters of cans which may be soldered by the machine.

In order to revolve the stalls D with the cans, and thus roll the latter, a tumbler H is fastened on the end of each of the axles D', opposite to the end on which the stalls D are fastened. Each of said tumblers has two pairs of arms standing at right angles with each other and at opposite ends of the tumbler H. Tracks H' are disposed beneath these arms and the tracks are so arranged with relation to each other as to engage either one or the other set of arms and turn the cans at the proper time. When oval cans are being operated upon the cams H' are made with a sinuous or wavy surface, as shown plainly in Fig. 3, and are fixed to the support G. These cams so stand with relation to each other that when two of the arms are following the convex upper curvature of one of the cams, the other arm standing at right angles therewith, the lowermost of said arms will be passing through the depression or concavity of its cam-surface, and when this arm commences

to move up the convex portion of its cam so as to revolve the stall and can connected with it, the other arm will, in turn, follow the concavity of its cam-surface. These arms thus alternately lie flatwise upon the convexity of the cams and follow this surface so as to partly turn the stalls and cans contained by them, and then pass into the concavity, while the other arm, in the same manner, will tilt so as to follow the convexity of its cam. This alternate operation of the two sets of arms acts to turn the stalls and the contained cans so as to submerge the whole circumference of the angle to be soldered before the can reaches the end of the solder-trough.

The carriers D^2 rest at one end on a straight portion of the support G and at the other end on a straight rib which is cast with the cam H′, and these surfaces extend the full length of the soldering-trough.

At each end of the machine is a plate I, fastened to the support G, said plates having semicurcular edges which engage one pair of the arms of the tumblers H and thus prevent the latter from revolving while passing around the ends of the machine.

A guide J is fixed to the legs A′ A^2 of the machine, and this supports the carriers D^2 while they are returning along the lower portion of their travel. This guide has also a straight rib or portion which engages one pair of the arms of the tumblers H, so that while passing over this portion of their travel they lie flat without turning and will always arrive at the front end of the machine with the stalls D in proper position to receive the cans.

K is an upright secured to the front end of the machine, and a pulley K′ is mounted loosely on its shaft K^2, the latter being fastened to the upright. The belt K^3 passes around this pulley and with another corresponding pulley, (not here shown,) and this belt serves to transport the cans to the machine.

Any suitable power is employed to drive the pulleys and belt. At the end of the belt is a vertical chute having a curved segmental portion near the top, into which the cans are delivered from the belt, and the cans pass down this chute and are delivered from its lower end into the stalls as the latter pass.

The mechanism for regulating the feeding of the cans from the chute into the machine consists of two triggers M and M′. These are fulcrumed upon the pin M^2, which is fixed to the chute and held in position, as shown in Fig. 3, by a coiled spring surrounding the shaft or pin M^2, as plainly shown in Fig. 3. One end of this spring is fastened to the trigger M and the other to a fixed collar upon the pin M^2. The trigger M′ has a bell-crank form, and its angle is fulcrumed upon the pin M^2. The lowermost arm projecting outwardly from the fulcrum-point is connected with a coil-spring M^6, which tends to draw this arm upward and correspondingly force the vertical arm inwardly. The point M^9 of this vertical arm extends into the channel of the chute and normally intercepts the cans so as to prevent their passing down through the chute. The movement of the trigger in this direction is determined by the stop-pin M^5, attached to the upper end of the trigger M, against which the trigger M′ is normally held by the spring M^6. The tension of the coil-spring M^3 is sufficient to overcome the tension of the spring M^6, and it thus holds both triggers normally in the position shown in Fig. 3, with the pin M^7 projecting from the trigger M into the passage in the chute through which the cans must pass. The pin M^9 is thus normally withdrawn from the passage so that the cans may drop down and rest upon the projection M^7. The arm or trigger M has an extension M^8 which projects downwardly into the path of the carriers D^2.

The operation of the apparatus will then be as follows: The soldering-trough is filled with solder, the latter being melted by any of the usual modes of applying heat to the apparatus. The pulleys being driven by any suitable power, as previously described, and the cans delivered upon the belt K^3, the movement of the belt carries the cans and delivers them into the chute L in which they slide by their own gravitation until the lowermost one rests upon the pin M^7. As the carriers D^2 move forward, each of them will engage the arm M^8 and thus actuate the trigger M, so as to withdraw the projecting lug M^7, thus leaving the passage open so that the lowermost can will fall into the next succeeding stall. This action coils the spring M^3, and thus relieving the spring M^6 of its tension, the latter acts to pull upward upon the bell-crank lever M′, the latter following the stop-pin M^5, and in so doing it projects the lug or stop M^9 into the space just below the second can from the bottom of the chute, so that while the lowermost one falls into the stall beneath the next one above is temporarily restrained by the stop M^9. As soon as the carrier D^2 releases the arm M^8, the parts resume their normal position, the stop M^7 being projected and the stop M^9 being withdrawn, so that another can will fall down upon the stop M^7 in readiness to be delivered to the next succeeding stall of the carrier.

Should any can arrive in the chute while the triggers are in action, that can will be held yieldingly against that part of the chute which separates the belt K^3 from the cans by reason of the trigger M′ being pressed against it by the action of the spring M^6 until the carrier releases the trigger M when the spring M^3 will instantly withdraw the trigger M′ and permit the can to slide down to the stop M^7, from which it is again released by the action of the next following carrier D^2. The cans thus released enter between the sides of the stall D and rest against the inclined plate B′, sliding down until the lowermost angle rests upon the bar B^2 within the soldering-trough. The stall continuing to move forward carries the can

with it first in the position shown in Fig. 5, and as the can enters the soldering-trough the camways H′ commence to act upon the tumblers, and thus cause a continuous revolution of the latter with the axle and the stall D in which the can is contained. This turning of the stall forces the can to roll over, first taking the position shown in Fig. 6, then the position shown in Fig. 7, after which the next turn of the stall will lift the rear portion of the can and roll it over into the position opposite to that shown in Fig. 6, and then into the position shown in Fig. 5, the rolling continuing in this manner until the seam of the can has been entirely exposed to the solder in the soldering-trough. At the end of this trough the plate B′ is continued with such an incline as to permit the can to leave the stall which is then in such a position that the can can slide out through the open side by gravitation. The can moves down this incline and is delivered upon a belt N^3, which passes around a pulley N, mounted loosely upon an axle N′, which is secured to the support N^2, fastened to the machine. The opposite end of this belt passes around a pulley, (not here shown,) to which power may be applied to rotate it and cause the belt to travel. While the cans are thus being carried away upon this belt, the solder upon the seams will be cooled sufficiently for the removal of the cans at the end of the belt.

As long as the receiving-belt K^3 is supplied with cans, each stall will by this mechanism receive a can, roll it through the machine and solder its end seam in like manner, and after the cans are discharged the stalls are returned along the lower support J and are again brought over the opposite end into position to receive another can.

In soldering square cans the camways H′ will be constructed as shown in Fig. 8, so as not to revolve the stalls D, but to hold them in position, as shown in Fig. 8, until one side seam of the can is completely soldered when the camways will act on the tumbler and turn it and its stall, so that the latter will roll or tilt the can over upon its corner, as shown in Fig. 8, in which position it falls over upon the next side.

In order to prevent the can from falling down abruptly and splashing into the solder, I have shown a supplemental attachment or pusher O for each of the stalls. This is so placed that as the can tilts over its angle upon which it stands, as shown in Fig. 8, it will fall down upon the pusher O and will then slide down the inclined portion of it, so as to pass gently into the solder with the next side submerged. It is raised and tilted upon this side in the same manner as previously described, and so on until all four sides of the can have been soldered, when it is delivered from the machine in the same manner as described for the oval cans.

In the case of round cans no stalls will be required, as these cans can be rolled along by the pushers pressing against them. The stalls or pushers may be used either upon a chain-carrier, as shown, or a wheel E^{10} may be employed, which turns about a vertical axis 20 and acts to rotate them in a horizontal circle, as shown in Fig. 9.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a soldering-machine, a series of turnable stalls each having an opening through it in a plane at right angles to the axis about which it turns, said opening adapted to receive, confine and automatically deliver cans, each of said stalls being essentially ⊏-shaped in longitudinal section and having an axle, about which it turns, projecting at right angles from its rear wall, a soldering-trough provided with means for supporting the lower edge of the can at a uniform depth in the solder and means for rotating the stalls.

2. In a can-soldering machine, a series of horizontally-moving stalls each having two opposing sides, an open front and a closed back from which the axle of the stall projects, and having an opening through it in a plane at right angles to said axle, an angular guide parallel to the line of travel of the cans and stalls against which the bottoms of the cans rest, whereby the seams at the lower angles are submerged in the solder and a bar submerged within the solder upon which said angles of the cans travel while being soldered.

3. In a can-soldering machine, a series of horizontally-moving stalls with parallel sides adapted to receive cans between said sides, a horizontal soldering-trough containing molten solder, an angular guide against which the bottom of the can rests and a support upon which the lower edge travels surmerged within the solder, tumblers each having arms arranged in pairs said tumblers being fixed upon the shafts which carry the stalls and independent camways upon which the arms of the tumblers travel and by which they are turned so as to rotate the stalls and cans and submerge the seam within the molten solder while the can is passing through the length of the soldering-trough.

4. In a can-soldering machine, a series of horizontally-moving stalls adapted to receive and roll cans, means for rotating the stalls about their axis, and turning the cans as the latter pass through the solder, a soldering-trough into which the seams of the cans are dipped while being rolled by the stalls, and mechanism for feeding the cans successively into the openings of the stalls, consisting of a chute with oscillating stops, and an actuating-arm adapted to be engaged by the moving stalls or carrier whereby the cans are successively delivered from the chute into the stall.

5. In a can-soldering machine, a series of horizontally-moving stalls adapted to receive rectangular cans, a soldering-trough in which the seams of the cans are dipped, a mechan-

ism whereby the stalls and cans are rotated to submerge the angular sides successively in the molten solder, and supplemental pushers, one for each stall, adapted to move the cans and to receive and let them down into the solder when tilted from one side to the next.

6. In a soldering-machine, a series of horizontally-moving stalls adapted to receive and roll cans, a soldering-trough into which the seams of the cans are dipped while being rolled by said stalls, an angular guide parallel to the line of travel of the cans and stalls against which guide the bottoms of the cans rest with the seams at the lower angles submerged in the solder, tumblers fixed upon the shafts which carry the stalls, and camways upon which the tumblers travel and by which they are turned so as to rotate the stalls and cans as the latter pass through the solder, an endless carrier by which the stalls and cans are moved and guides over which the tumbler-arms pass whereby the stalls are held in position to receive the cans from the feeding device and present them to the soldering-trough.

7. In a soldering-machine, a series of horizontally-moving stalls adapted to receive and roll cans, a soldering-trough into which the seams of the cans are dipped while being rolled, and mechanism whereby the stalls and cans are rotated, a delivery-chute through which the cans pass, and means for delivering the cans singly and successively to the stalls as the latter pass the mouth of the chute, consisting of spring-actuated triggers, an arm extending into the line of travel of the carrier so as to be intermittently actuated thereby, stops projecting from the triggers, one of said stops arresting the lowermost can and the other arresting the can above when the trigger is so moved as to discharge the lowermost can, said uppermost trigger being moved out of the path of the cans when the lowermost one is returned to its position so as to allow the cans to move downward and another one to rest upon the lowermost trigger preparatory to its discharge.

In witness whereof I have hereunto set my hand.

MATHIAS JENSEN.

Witnesses:
C. W. FULTON,
ELLA RUCKER.