To all whom it may concern:

Be it known that I, HENRY BLANFORD, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Means for Fluxing Cans, of which the following is a specification.

My invention relates to improvements in means for applying flux to cans, about the filler openings therein, preparatory to soldering caps or covers on the cans to cover the openings, the present application being divided out of an application for United States Letters Patent filed by me on May 31st, 1912, and bearing Serial No. 700,758.

My primary object, generally stated, is to provide improvements in flux-applying mechanism to the end of applying to the cans, about the filler openings therein, the proper amount of flux for insuring the proper soldering of the covers to the cans; to provide simple and improved mechanism for this purpose; to provide a machine wherein the cans to be filled are automatically moved into position for being operated on by flux-applying mechanism; and, generally, to provide improvements in mechanism of this character whereby it will be caused to better perform the functions for which it is provided.

I have devised my improvements for use, more particularly, in a can filling and sealing machine wherein provision is made not only for the automatic filling of the cans, but also for the sealing thereof after filling; said sealing mechanism comprising flux-applying mechanism, cap-applying mechanism, solder-ring-applying mechanism, and solder-fusing mechanism, whereby the cans are automatically advanced through the machine and automatically filled and sealed, the can-filling, cap-applying, solder-ring-applying, and solder-fusing mechanisms not being the subject of the present invention, but being clearly disclosed in the above-referred to pending application, a description of these mechanisms will not be necessary.

Referring to the accompanying drawings,—Figure 1 is a view in side elevation of a can-filling and sealing machine, equipped with flux-applying mechanism and with cooperating can-moving mechanism constructed in accordance with my invention, the trough through which the cans are conveyed to the feed mechanism of the machine being shown in section. Fig. 2 is a view similar to Fig. 1 of the opposite side of the machine. Fig. 3 is a longitudinal sectional elevation of the machine. Fig. 4 is a section taken at the line 4 on Fig. 3, and viewed in the direction of the arrow. Fig. 5 is a section taken at the line 5 on Fig. 4, and viewed in the direction of the arrow. Fig. 6 is an enlarged section taken at the line 6 on Fig. 1, and viewed in the direction of the arrow, this view showing my improved flux-applying mechanism with a series of cans located below said mechanism and in position to be operated on by the latter. Fig. 7 is a view, like Fig. 6, showing the flux-applying members depressed and in the position they assume when applying flux to the cans about the openings to be sealed; and Fig. 8, an enlarged section taken at the line 8 on Fig. 7, and viewed in the direction of the arrow.

In the machine illustrated provision is made for the automatic feeding of the cans through the machine by a step-by-step movement, and during the periods of rest, successively filling the cans with the material to be inclosed therein, applying a fluxing agent, caps and solder-rings, and thereupon fusing the solder, but as the filling mechanism, cap-applying mechanism, solder-ring-applying mechanism and solder-fusing mechanism, as hereinbefore stated and illustrated at W, X, Y, and Z, respectively, form no part of the present invention, a description of the construction and mode of operation thereof appears to be unnecessary, excepting to state that in the machine illustrated the cans, after being filled, and then operated on by my improved flux-applying mechanism hereinafter described, are advanced successively to the cap and solder-ring applying mechanisms and solder-fusing mechanism, by the same mechanism which moves the cans successively into registration with the flux-applying mechanism.

In the drawings, I have illustrated a machine in which my improvements, in their preferred embodiment, are incorporated, and wherein provision is made by reason of the proportions of the machine for operation by each of the above referred to means upon three cans at a time, though it will be readily understood from the following description that by widening the machine and duplicating the several units of the va.
rious mechanisms, the number of cans operated upon at a time by each mechanism may be increased as desired, this being one of the advantages of my machine from a commercial standpoint.

The frame of the machine illustrated comprises a bed 9 containing longitudinally-extending parallel slots 10 and provided along its lateral edges with upwardly-extending rails 11, spaced apart a distance substantially equal to the combined width of the transverse series of cans to be operated on, as illustrated in Fig. 6; side-frames 12, to which the bed 9 is secured and upon which the latter rests, and bolts 13 connecting said side frames together to form a rigid support for the operating parts hereinafter described. In the particular construction illustrated, the side-rails 11 of the bed are formed integrally with the side-frames 12 and the bed-proper 9 is formed of bars, spaced apart, to present the longitudinally-extending slots 10, and is secured to yoke-shaped depending members 14 extending transversely of the bed 9 and fastened to the rails 11 in any desirable manner.

The cans to be filled and represented at 15 are supplied to the top of the bed 9, and are then advanced along the latter by a step-by-step movement into position for being operated upon successively, by the filling mechanism and the various mechanisms for sealing the cans, by means of a series of bars 16, shown as three in number, to correspond with the number of cans to be filled, in each transverse row thereof, the bars 16 being connected together at their under sides by transversely-extending plates 17, 18 and 19. The upper surfaces of the bars 16 are provided with transversely-extending lugs 20, the rear faces of which are vertical, as represented at 21, and the other faces thereof incline downwardly and forwardly, as represented at 22, these lugs being spaced apart longitudinally of the bars 16, a distance slightly in excess of the diameter of the cans 15, as represented in Fig. 3.

In the operation of the machine, the bars 16 are reciprocated both longitudinally of, and up and down through, the slots 10 in the bed 9, said bars being provided for the purpose of simultaneously advancing all of the cans a predetermined distance along the bed 9 into proper position for being operated on successively by the filling and sealing mechanisms hereinbefore referred to, the bars 16 after completing their forward movement in the direction of the arrow in Fig. 3 for advancing the cans, being withdrawn from the rear edges of the latter and below the bed 9 and thereupon moved in said depressed condition to the left in said figure, a distance equal to the distance between adjacent faces 21 of the lugs 20, the extreme forward position to which said bars are moved in returning them preparatory to again advancing the cans being represented in Fig. 3. The illustrated means for thus actuating the bars 16 comprise two separate mechanisms, one for reciprocating the bars and the other for controlling the raising and lowering of the latter, these mechanisms being so timed in their operations as to cause the bars 16 to be lowered below the plane of the bed 9 during the return movement of the bars to the position illustrated in Fig. 3, and be lifted above the plane of said bed preparatory to the movement of said bars to the right in said figure from the position therein shown for advancing the cans.

The mechanism for reciprocating the bars longitudinally of the bed 9 comprises a link 28 pivotally connected at one end as indicated at 24 to the plate 19, said link being provided at its opposite end with rollers 25, 26, spaced apart and cooperating with a cam 27 located between said rollers and mounted on a shaft 33 which extends through a slot 29 in the link 28 and is journaled toward its opposite ends in the frame members 12, whereby when the shaft 33 is rotated, the link 28 will be reciprocated back and forth for reciprocating the bars 16. In the construction illustrated, the shaft 28 is continuously driven in the direction indicated by the arrow in Fig. 3, through the medium of a main drive shaft 30 which is journaled in bearings 31 on the frame of the machine, the shaft 30, which may be operated in any suitable manner, carrying a worm 32 which meshes with a worm-wheel 33 rigid on the shaft 28.

The mechanism for raising and lowering the cans-advancing bars 16 comprises rockshafts 34 journaled in the frame-sides 12, upwardly and downwardly-extending arms 35 and 36, respectively, connected with the rockshafts 34, a link 37 pivotally connected at its opposite ends, as indicated at 38, to the lower ends of the arms 36 at one side of the machine, rollers 39 and 40 journaled on the link 37, and a cam 41 secured to the outer end of the shaft 28 and extending into a position to engage the rollers 39 and 40 for reciprocating the link 37 and thus causing the arms 35 to be rocked up and down. The parts just described are illustrated in Fig. 1 in the position they occupy when the arms 35 are swung to their lowermost position. When the shaft 28 is rotated, as hereinbefore described, the engagement of the cam 41 with the rollers 39 and 40 will cause the link 37 to be forced to the right in Fig. 1, thus swinging the arms 35 upwardly, these arms in said movement engaging with the plates 17 and 18 and operating to lift the latter and the bars 16 into a position in which the lugs 20 will extend up through the slots 10 in the bed 9, as illustrated in Fig. 3.
Fig. 6, in which position the ends of the arms 35 form supports upon which the members 17 and 18 slide in the can-advancing operation, the bars being in turn supported from said members.

My improved flux-applying mechanism is designed, more particularly, to apply a suitable flux to the tops of the cans about the openings 42 therein after the latter have been filled by the filling mechanism W and preparatory to the depositing of caps and solder thereon and fusing the solder, the following being a description of such mechanism; secured to the frame of the machine, as indicated at 43, is a yoke-frame 44 in which vertically reciprocable flux-containing members 45, arranged in a series transversely of the machine are confined. The members are in the form of tubes 46 screwed at their upper ends into a cross-head 47, and divided by partitions 48 into upper flux-containing chambers 49 and lower chambers 50. The partitions 48 contain openings 51, the walls of which taper upwardly, and extending into said openings are the frusto-conical heads 52 provided on the lower ends of rods 53 which extend through openings 54 in caps 55 screwed upon the upper ends of the tubes 46. The upper ends of the rods 53, which are screw-threaded, as represented at 56, carry wing-nuts 57 through the medium of which the positions of the heads 52 in the openings 51 may be regulated for controlling the gravity-feed of the flux-agent in the chambers 49 past the heads 52. The chambers 50 contain tubes 58 of felt, or any other suitable absorbent material, which surround the heads 52 and project below the lower ends of the tubes 46, the internal diameter of the tubes 58 being preferably slightly greater than the openings 52 in the cans, and, in the particular construction illustrated, of such diameter as will cause them to extend into the annular grooves 59, provided about the openings 42, when the fluxing mechanism is operated as heretofore described. For convenience in filling the chambers 49 with the fluxing agent, which may be of any desirable kind, but is preferably formed of rosin dissolved in gasoline, I provide funnels 60, which are secured to the respective tubes 46 and open into the upper ends of the chambers 49, as represented in Fig. 8. The tubes 46 are provided below the funnels 60 with annular flanges 61 between which and shouldered portions 62 of the yoke-frame 44, coil-springs 63 are positioned, these springs tending to hold the members 45 in raised position, as represented in Fig. 6.

In the operation of the machine the tubes 46 are reciprocated up and down in the frame 44 to cause the tubes 58, which are maintained constantly saturated with the fluxing fluid in the chambers 39, to be carried into and out of contact with the upper surfaces of the grooves 59, as represented in Fig. 8, for daubing the flux thereon, a description of the illustrated means provided for this purpose being as follows: Pivoted between its ends, as indicated at 64, to an upwardly-extending bracket 65 on the yoke 41, is a lever 66, one end of said lever being pivotally connected, as indicated at 67, to a bracket 68 forming a part of the cross-head 47 and pivotally connected at its opposite end, as indicated at 69, to a vertically disposed link 70 slideable in a slot 71 in an extension 72 on the yoke-frame 41. The link 70 is bifurcated at its lower end, as indicated at 73 (Fig. 4) and at said bifurcated portion straddles and seats upon, under action of the springs 63, a lever 74 connected with the outer end of a shaft 75 journaled in the frame-sides 12. The lever 74 carries at its free end a roller 76, which cooperates with a cam 77 secured to the shaft 78, whereby upon rotating the shaft 78, as hereinbefore described, and in the direction of the arrow in Fig. 5, the lever 74 will be rocked up and down on its pivot 75, the lever 74 in the particular machine illustrated serving the double function of reciprocating the link 70 and operating can-lifting mechanism 78 connected with the shaft 75 and serving, when projected up through slots in the bed 9, to lift the cans, when positioned beneath the filler, cap-applicator, and solder-ringing mechanism. The reciprocation of the flux-applying members 45 is thus controlled by the movement of the cam 77 against the roller 76, the members 45, when the lever 74 and cam 77 occupy the relative positions illustrated in Fig. 5, being in raised position and when the can-surface of said cam is moved into engagement with the roller 76 to move the lever 74, moving the members 45 to the position illustrated in Fig. 7, in which position the tubes 58 contact with the grooves 59 in the cans for applying the flux thereto.

As hereinbefore stated the conveyor serves to intermittently move the cans to be filled and sealed, through the machine and be automatically-operated upon when at rest, by the filling mechanism and the various scaling mechanisms, and to the end of causing the flux to be thus automatically applied to the cans, the cam 77 is so positioned relative to the cans 27 and 41 that during the movement of the conveyor-bars 16 to the right in Fig. 3 and when in raised position, the members 45 will be in raised position, Fig. 6, and during the return movement of the bars 16 in depressed condition for repositioning them to perform another can-advancing operation, the link 70 will be raised by the cam 77 consequently depressing the members 45 for causing the tubes 58 to contact with the grooves 59 of the cans immediately below them.
While I have illustrated my improved fluxing mechanism as forming an element of a machine designed to automatically fill and seal cans, it will be readily understood that where desired my improved fluxing mechanism may be used independently of the filling mechanism and the other elements forming the sealing mechanism, and, if desired, may be employed with any other suitable type of can-feeding mechanism, or may be employed independently of can-feeding mechanism, all of which departures from the machine as illustrated, as well as various modifications and alterations of the flux-applying mechanism illustrated, being within my invention as I wish to be understood as claiming it.

What I claim as new and desire to secure by Letters Patent is:

1. The combination with a support for a can, of means for applying flux thereto about the opening in the can comprising a tubular member supported to be reciprocated toward and away from the can into and out of contact therewith and open at its lower end, an apertured partition in said tube between the ends of the latter and forming with the tube a flux-chamber, a member of absorbent material in the lower end of said tube and projecting below the latter, a valve in said tube controlling the aperture in said partition, the stem of said valve extending up through the upper end of said tube, adjusting means on the upper end of said valve, and means for reciprocating said tube, for the purpose set forth.

2. The combination with a support for a can, of means for applying flux thereto about the opening in the can comprising a tubular member supported to be reciprocated toward and away from the can into and out of contact therewith and open at its lower end, an apertured partition in said tube between the ends of the latter and forming with the tube a flux-chamber, a member of absorbent material in the lower end of said tube and projecting below the latter, a valve in said tube controlling the aperture in said partition, means connected with said valve for adjusting it relative to said partition, and means for reciprocating said tube, for the purpose set forth.

3. The combination with a support for a can, of means for applying flux thereto about the opening in the can comprising a tubular member supported to be reciprocated toward and away from the can into and out of contact therewith and open at its lower end, an apertured partition in said tube between the ends of the latter and forming with the tube a flux-chamber, a member of absorbent material in the lower end of said tube and projecting below the latter, a valve in said tube controlling the aperture in said partition, adjusting means on the upper end of said valve, and means for reciprocating said tube, for the purpose set forth.

4. The combination with a support for a can, of means for applying flux thereto about the opening in the can comprising a tubular member supported to be reciprocated toward and away from the can into and out of contact therewith and open at its lower end, an apertured partition in said tube between the ends of the latter and forming with the tube a flux-chamber, an annular member of absorbent material in the lower end of said tube and projecting below the latter, a valve in said tube controlling the aperture in said partition, said valve being of a diameter substantially equal to the internal diameter of said annular member and extending close to the lower end of said tube, means for reciprocating said tube, for the purpose set forth.

5. The combination with a support for a can, of means for applying flux thereto about the opening in the can comprising a tubular member supported to be reciprocated toward and away from the can into and out of contact therewith and open at its lower end, a member of absorbent material in the lower end of said tube and projecting below the latter, a valve in said tube controlling the aperture in said partition, means for reciprocating said tube, for the purpose set forth.

6. The combination with a support for a can, of means for applying flux thereto comprising a pivotally supported lever, a reciprocatory tube movable toward and away from the cans and containing a flux-receiving chamber and a member of absorbent material supplied with flux from said chamber, said tube being operatively connected with said lever and means for guiding said tube in its reciprocations, a shoulder on said tube, and spring means between said shoulder and guide-means for yieldingly holding said tube in raised position.

HENRY BLANFORD.

In presence of——
D. C. THORSEN,
O. C. AVISUS.