

J. G. HODGSON.
CAN LACQUERING OR COATING MACHINE.
APPLICATION FILED JULY 26, 1907.

1,104,503.

Patented July 21, 1914.

3 SHEETS-SHEET 1.

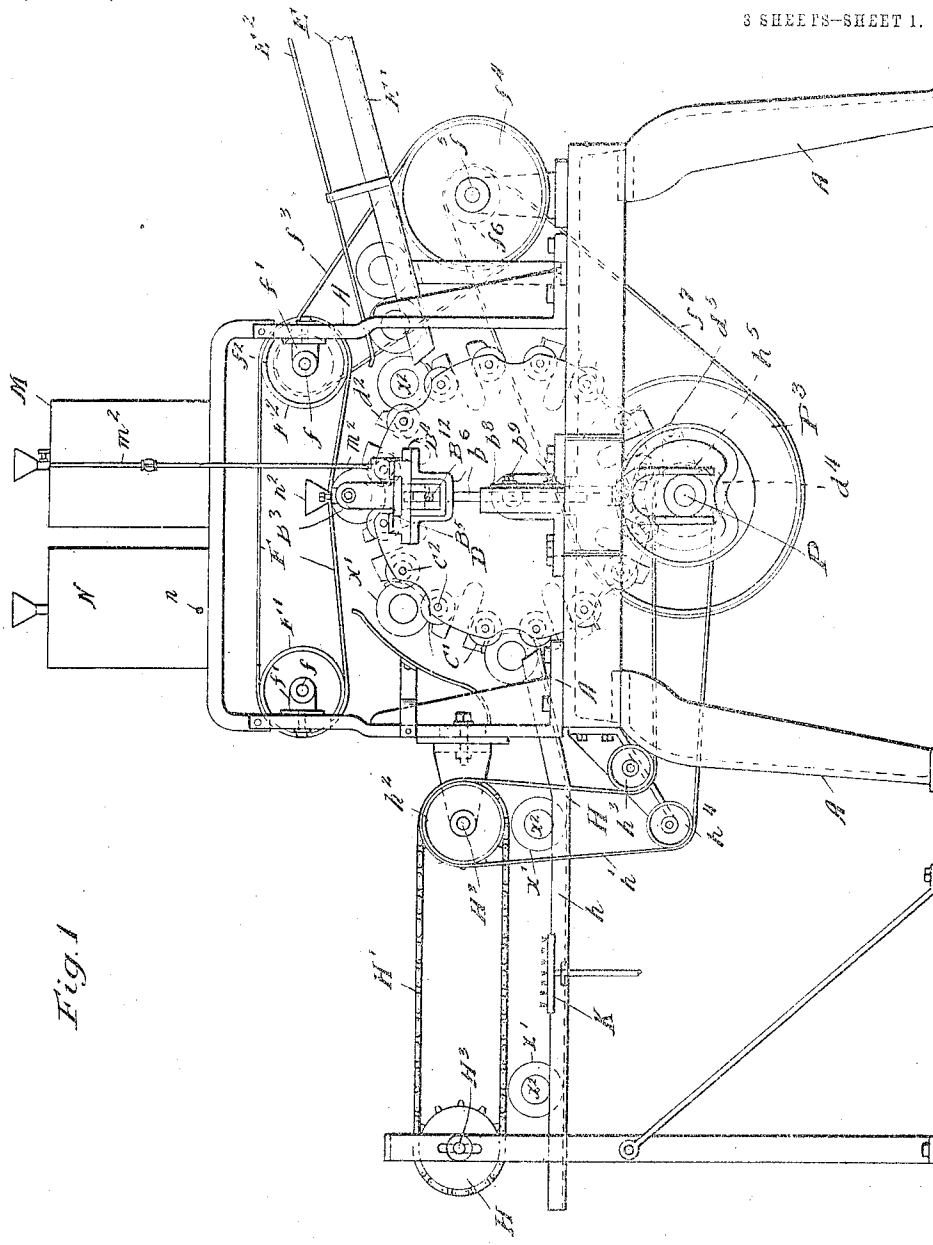


Fig. 1

Witnesses:

Wm. Seiger
J. W. Munday

Inventor

John G. Hodgson

By Munday, Evans & Clarke

Attorneys

1,104,503.

3 SHEETS--SHEET 2.

Wm. Geiger
Attest

By Munday, Warts, Adcock & Clark:

Attorneys

J. G. HODGSON.
CAN LACQUERING OR COATING MACHINE.
APPLICATION FILED JULY 26, 1907.

1,104,503.

Patented July 21, 1914.

3 SHEETS—SHEET 3.

Fig. 4.

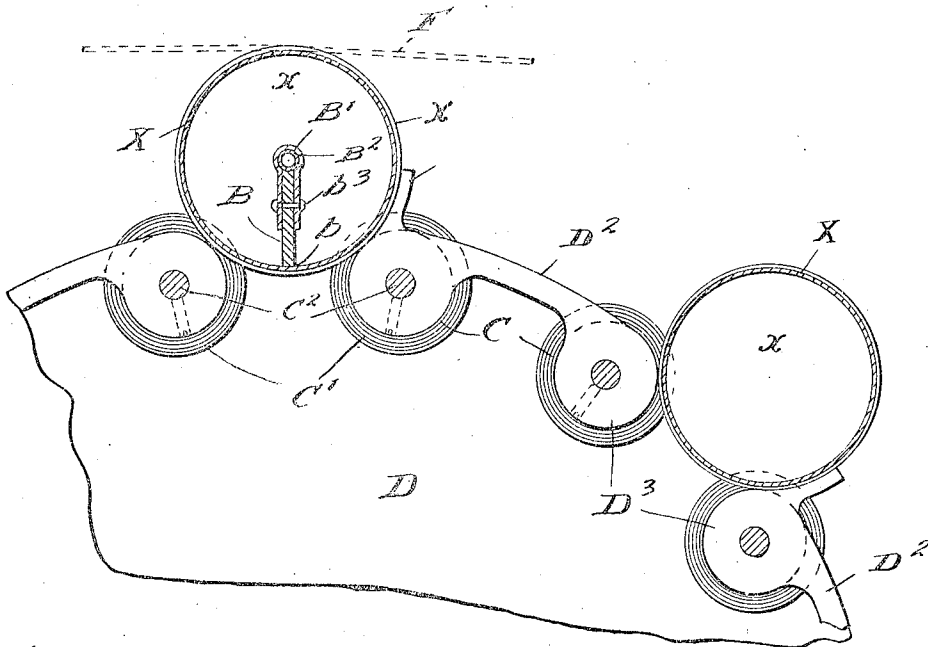


Fig. 5.

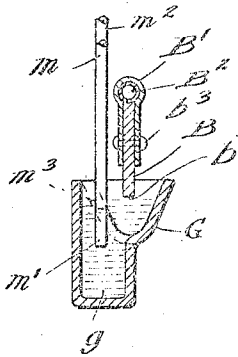


Fig. 6.

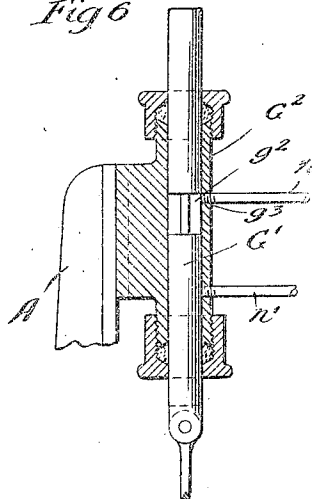
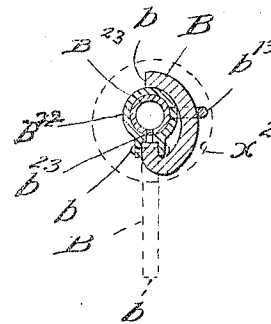


Fig. 7.



Witnesses:

Wm. Geiger
H. W. Munday

Inventor:

John C. Hodgson

By Munday, Evans, Adcock & Clark

Attorneys

UNITED STATES PATENT OFFICE.

JOHN G. HODGSON, OF MAYWOOD, ILLINOIS, ASSIGNOR TO AMERICAN CAN COMPANY,
OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CAN LACQUERING OR COATING MACHINE.

1,104,503.

Specification of Letters Patent.

Patented July 21, 1914.

Application filed July 26, 1907. Serial No. 385,627.

To all whom it may concern:

Be it known that I, JOHN G. HODGSON, a citizen of the United States, residing in Maywood, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Can Lacquering or Coating Machines, of which the following is a specification.

My invention relates to improvements in machines for lining or coating cans on the inside with lacquer or other protective coatings.

The object of my invention is to provide a simple and efficient machine for automatically, rapidly and cheaply lining or coating sheet metal preserving cans on the inside, uniformly, perfectly and continuously through their entire interior surface with a protective coating of lacquer or other material that will be dry, hard, solid and firmly adherent, innocuous, tasteless, insoluble in vegetable or food acids or juices, and that will successfully withstand without injury the heat of the cooking or processing step to which the cans are subjected after being filled, and the heat of the soldering operation employed in soldering in place the caps that close the filling openings in cans, and by which also during the coating operation the interior of the cans may be effectually sterilized and rendered perfectly sanitary.

My invention consists in the machine I have devised for practically accomplishing this object or result, the same comprising primarily a holder for the cans, a swab having a longitudinal face for contacting with the interior periphery of the can and an end face or end faces for contacting with the bottom head or top and bottom heads of the cans according as the can to be coated has only one head or two heads, with mechanism for inserting the swab in the can either by moving the swab toward the can or the can toward the swab, and mechanism for rotating the swab and can relatively to each other, means for supplying the swab with liquid lacquer or protective coating, a runway or device for delivering the cans to the can holder or holders, a discharge runway for the freshly coated cans and a gas jet or ignition device for igniting the vapors in and issuing from the freshly coated cans as they move along the runway, and thus flashing and sterilizing the interior of the cans.

In practising my invention, I prefer to mount the swab to reciprocate in and out of the can instead of moving the can into a position surrounding the swab, and I also prefer to rotate the can in respect to the swab instead of rotating the swab in respect to the can. I also prefer to employ a plurality of can holders, the same being mounted on a movable carrier which is preferably given an intermittent movement to bring each can holder in turn into registry with the swab.

My invention also consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown and described.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of the machine embodying my invention. Fig. 2 is an end elevation showing some parts broken away or sectioned. Fig. 3 is a detail central vertical longitudinal section showing the swab and other parts. Figs. 4 and 5 are detail cross sections on lines 4—4 and 5—5 respectively of Fig. 3; Fig. 6 is a detail vertical section showing the feed plunger for the liquid coating material or lacquer. Fig. 7 illustrates a modified construction of the swab.

In the drawing, A represents the frame of the machine, B the swab, C C the can holders, D the carrier or conveyor upon which the can holders are mounted, E the can runway or device for delivering the cans to the can holders, F the mechanism or device for rotating the cans, G a feed trough for supplying liquid lacquer or coating material to the swab, G¹ a feed plunger which also may be used for supplying lacquer or coating material to the swab, H the discharge runway for the freshly coated cans, K a gas jet for igniting or flashing the cans as they move along the discharge runway, and M N tanks containing the liquid lacquer or coating material.

The swab B has a longitudinal edge *b* for contacting with the inner periphery of the can and transverse or end edges *b*¹ *b*² for contacting with the top and bottom heads *x* *x*¹ of the can X according as the same has one or two heads. The swab B I prefer to make of an absorbent pad of felt or like material instead of bristles; and it is of a size and shape adapted to enter within the

filling opening or mouth α^2 of the can. In length, the swab B preferably approximates that of the can so that a slight longitudinal movement or reciprocation of the swab in the can will cause first one end face b^1 to contact with one head of the can and then the other end face b^2 to contact with the other head of the can, the longitudinal face b of the swab remaining in contact with the interior periphery of the can during the whole operation. The swab B is secured in its holder or clamp B^1 preferably by screws or rivets b^3 . The swab holder B^1 is preferably mounted to reciprocate in and out of the can and also to have a slight up and down movement in the can to bring its longitudinal coating edge b into contact with the interior periphery of the can and to adapt it to readily enter the somewhat contracted filling opening α^2 in the top head α^1 of the can in cases where the cans have top heads instead of simply a bottom head with open upper ends of the full diameter of the can body. I prefer to impart these movements to the swab rather than to the can or its holder in order to bring the swab and can holder into cooperative relation. The stem B^2 of the swab holder, which is preferably hollow so that it may also be utilized for supplying the liquid lacquer or coating material to the swab if desired, is actuated by a horizontally reciprocating slide B^3 carried on a vertically movable slide or support B^4 , this being a simple and convenient means for imparting to the swab its necessary double movement in and out of and up and down in the can. The horizontal slide B^3 is preferably horizontally reciprocated as required in its guides B^5 on the vertically movable slide or support B^4 by means of a cam P^1 on the main cam or driving shaft P through the connecting link B^6 , bent lever B^7 , link B^8 and bent lever B^9 , one arm of which has a roller B^{10} engaging the cam P. The link B^9 is preferably furnished with screw threaded or adjustable members B^{11} , B^{12} for adjusting the slide B^3 in respect to its operating mechanism. The swab holder stem B^2 preferably has a spring or yielding connection b^4 b^5 with the slide B^3 to give a yielding pressure to the end faces b^1 b^2 of the swab against the top and bottom heads of the can. The cam P^1 which reciprocates the swab in and out of the can is preferably provided with a secondary cam surface or incline p to give a supplemental reciprocation to the swab while in the can to bring first its end face b^1 against the bottom head of the can and then its end face b^2 against the top head of the can.

The movable guide or support B^4 which serves to move the swab up and down in the can as required is preferably moved up and down in its guide a on the main frame of

the machine by means of a cam P^2 on the cam shaft P, the slide B^4 or its upright member b^6 carrying at its lower end an anti-friction roller b^7 which engages the cam P^2 . The upright stem or member b^6 of the support B^4 is preferably furnished with an adjustable or slotted part b^8 fixed in place by clamp bolts b^9 for vertical adjustment of the movable support or slide B^4 through which the swab B is given its up and down movements. To limit the downward movement of the swab and the pressure of its lower longitudinal edge against the interior periphery of the can, I provide the movable support B^4 or its upright stem b^6 with a stop b^{10} engaging an adjustable stop or screw b^{11} on the frame of the machine. The same cam P^2 which moves the swab up and down while inside the can to bring its longitudinal edge b into proper contact with the inner periphery of the can also serves to immerse or project the lower edge of the swab to the proper depth into the feed trough G.

The can holder C may be of any suitable construction adapted to hold the can in cooperative relation with the swab. In that embodiment of my invention wherein the can is the member rotated, as illustrated in the drawing, the can holder is rotatable or of a construction adapted to permit the rotation of the can. The construction of the rotatable can holder C which I prefer to employ consists of a pair of rollers, each preferably furnished with flanges C^1 at each end to prevent longitudinal movement of the can in the holder as the swab is being inserted and removed therefrom. A plurality or series of can holders C, each consisting of a pair of rotatable rollers is preferably employed, the same being mounted on an intermittently movable carrier D, consisting preferably of a pair of wheels or disks secured to the shaft D^1 . The carrier disks D D may be adjusted farther apart or closer together on their shaft D^1 , as required to accommodate cans of different lengths, by means of set screws d .

The shafts C^2 of the can holder rollers C are journaled in suitable holes or bearings in the carrier disks D D. The carrier D may be intermittently rotated to bring the several can holders thereon successively into registry with the swab B by any suitable mechanism, the same consisting preferably of a Geneva stop mechanism comprising a radially slotted wheel d^2 on the carrier shaft D^1 having curved stop faces d^3 , and which wheel engages a cooperating rotating disk and crank pin d^4 d^5 on the cam shaft P.

The carrier D is preferably furnished with bridges D^2 extending between adjacent can holders to prevent the cans from getting between the adjacent rollers of two adjacent can holders, and thus interfering with the

proper rotation of the can holder rollers. Each of the bridges D^2 preferably consists of a sheet metal plate or strap having bent ends D^3 partially embracing the shafts C^2 C^2 of the adjacent rollers C C of two adjacent can holders. The device E for delivering the cans to the can holders automatically preferably consists of an inclined runway having guide flanges E^1 and an upper guard rail E^2 .

Any suitable means may be employed for rotating the can when it is brought into co-operative relation with the swab. Instead, however, of rotating or driving the can holder rollers C C in order to impart rotary movement to the can, I prefer to combine with the other parts a can rotating mechanism which engages the can itself, as this materially simplifies the construction of the machine. And I have accordingly illustrated in the drawing a can rotating mechanism F operating in this manner, the same consisting preferably of an endless flexible belt F which engages the can when it is brought into registry with the swab B by movement of the can holder carrier D . The can rotating belt F is mounted upon a pair of pulleys F^1 F^2 , the shafts f of which are journaled in vertically adjustable bearings f^1 on the frame of the machine so that the can rotating belt may be adjusted up and down to accommodate cans of different diameters. The shaft f of one of the pulleys F^2 is furnished with a pulley f^2 to which motion is communicated by a belt f^3 from a pulley f^4 on the countershaft f^5 having a pulley f^6 which receives motion through a belt f^7 from a pulley P^2 on the main driving shaft P .

The feed trough G is a narrow trough somewhat exceeding in length the length of the swab B , and it is preferably furnished with a well or deepened portion g and with a device, as m^3 which limits the depth or level of the liquid lacquer or coating material in the trough G ; so that the liquid lacquer in the trough G may be maintained at a uniform and constant level and thus cause the absorbent swab B to receive or absorb a uniform or measured quantity of liquid each time it is inserted or immersed therein. The liquid lacquer or coating material supply tank M is preferably a tight or hermetically closed tank and it is furnished with a feed pipe m , the lower end m^1 of which projects into the well g of the feed trough G below the level limiting device m^3 . That is to say, below the level of the liquid lacquer in the trough G . And the closed tank M has an air or vent pipe m^2 leading from the upper portion of the tank M into the trough G or its well g with its lower end m^3 , substantially on a level with the upper edge of the overflow lip g^1 of the feed trough G , so that when the rise of the

liquid in the trough G closes the lower end m^3 of the vent pipe m^2 , further flow of liquid into the feed trough from the tank M will then automatically cease. By this means the liquid lacquer or coating material in the feed trough is automatically maintained at a uniform or constant height or level in the feed trough, while at the same time the liquid automatically flows into the feed trough as required.

When the swab B is composed of an absorbent pad of felt or like material, the liquid lacquer, by capillary action, will extend from the outer longitudinal portion b of the pad which is inserted in the liquid lacquer to the end portions or faces b^1 b^2 thereof which are to contact with the top and bottom heads of the can; and the trough G may, if desired, be used as the only device for feeding the lacquer in measured quantities to the swab. But I prefer to employ in addition to the feed trough G , a supplemental lacquer feed or supply device G^1 by which the liquid lacquer or coating material may be additionally fed or supplied to the swab through the hollow stem B^2 of the swab holder. The liquid coating material feed device G^1 preferably consists of a reciprocating plunger having a feed pocket or recess g^2 for feeding a measured quantity of liquid lacquer to each can. On the upstroke, for example, of the feed plunger G^1 , the feed pocket g^2 therein is brought into registry with a feed port g^3 in the plunger cylinder G^2 , and which communicates with the feed pipe n of the tank N ; and on the opposite or down stroke of the feed plunger G^1 , the feed pocket g^2 comes into registry with the feed pipe n^1 which thus delivers a measured quantity of lacquer into the funnel n^2 mounted on and communicating with the hollow stem B^2 of the swab holder B^1 . The hollow stem B^1 of the swab holder is furnished with orifices b^2 through which the liquid lacquer or coating material escapes into the swab. These orifices may extend the full length of the swab or may be located chiefly near each end of the swab as may be desired.

I prefer to employ both the feed trough and the feed plunger and hollow orificed stem B^2 as means for feeding or supplying the lacquer or liquid coating material to the swab, but either one of these feed devices may be employed without the other if desired.

The discharge device H by which the freshly coated cans are discharged from the can holders and conveyed past the gas jet or igniting device K preferably consists of a runway, the inner end of which is preferably somewhat inclined. The rails of this runway have upright flanges h to guide the cans as they roll along it. To insure proper movement of the cans along the runway, I

prefer to provide it with an endless conveyer chain or belt H^1 mounted on pulleys H^2 , the shafts H^3 of which are journaled in suitable bearings or supports on the frame of the machine. The shaft of one of these pulleys is preferably driven by a belt h^1 traveling on pulleys h^2 h^3 h^4 h^5 , the latter being on the main driving shaft P.

To flash and sterilize the cans by fire, and also to quickly dry, harden and render firmly adherent the preservative coating applied on the inner side thereof, and to free the same from vapors arising from the volatile and inflammable ingredients of the lacquer or preservative coating applied thereto and consequent injury to workmen or danger of fire, and also to eliminate from the interior coatings of the cans all taste, odor, or flavor that might otherwise exist from the coating, I mount adjacent to the can runway H a gas jet or other igniting device K so that as each can passes the gas jet on the runway the vapors in the can and issuing therefrom will be flashed, exploded and burnt.

For operation upon cans which are open mouthed or which have top heads with filling openings therein of ordinary size, the swab may be adapted to enter the can by making it small enough in transverse or radial dimension for this purpose, and then the transverse, radial or up and down movement of the swab while in the can will bring its outer or lower edge into proper contact with the periphery of the rotating can. If preferred, however, the swab may be contracted or folded transversely and thus adapted to enter a comparatively small opening in the can, as illustrated in the modification at Fig. 7, in which the swab holder B^{22} is furnished with a rotatable member B^{23} carrying a finger b^{13} for holding or wrapping the swab around the holder to contract it transversely so it will enter the small opening of the can, indicated by the dotted lines a^2 .

I claim:—

1. In an automatic machine for coating the inside of cans with lacquer or protective material, the combination with a plurality of rotatable can holders, an intermittently movable carrier upon which said holders are mounted, a runway for delivering the cans to the holders, means for successively rotating the cans in the holders, a longitudinally reciprocating and transversely movable swab adapted to enter the can mouth or opening, a feed trough for the lacquer or coating material, a holder for said swab, a hollow perforated stem for said swab holder, a feed plunger communicating with said hollow stem, a longitudinally reciprocating slide for operating said swab, a transversely movable support for said slide, a discharge runway, and a flame jet for flash-

ing or igniting and sterilizing the freshly coated cans as they pass on the discharge runway, substantially as specified.

2. The combination with a can holder of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the mouth or opening of the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the swab and the can in said can holder into coöperative relation with each other with the swab inside the can, and in rubbing contact with its interior surface, and means for rotating said can and swab, relatively to each other, substantially as specified.

3. The combination with a can holder, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the mouth or opening of the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the swab and the can in said can holder into coöperative relation with each other with the swab inside the can, and in rubbing contact with its interior surface, means for rotating said can and swab relatively to each other, and means for reciprocating one of said parts, the swab or can, in respect to the other while the swab is inside the can, substantially as specified.

4. The combination with a can holder, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the mouth or opening of the can, and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the swab and the can in said can holder into coöperative relation with each other with the swab inside the can, and in rubbing contact with its interior surface, means for rotating said can and swab, relatively to each other, and means for automatically feeding or supplying liquid lacquer or coating material to the swab, substantially as specified.

5. The combination with a can holder, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the mouth or opening of the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the swab and the can in said can holder into coöperative relation with each other with the swab inside the can, and in rubbing contact with its interior surface, means for rotating said can and swab, relatively to each other, and means for automatically feeding or supplying liquid lacquer or coating material to

the longitudinal outer edge of said swab, substantially as specified.

6. The combination with a can holder, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the mouth or opening of the can, and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the swab and the can in said can holder into coöperative relation with each other with the swab inside the can, and in rubbing contact with its interior surface, means for rotating said can and swab, relatively to each other, and means for automatically feeding or supplying liquid lacquer or coating material to the inner part of said swab, substantially as specified.

7. A can coating machine comprising in combination a holder or support for the can and a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and contact with its inner periphery and with its head or heads, and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and automatic mechanism for bringing said swab and can into operative relation with the swab inside the can, and in rubbing contact with its interior surface, substantially as specified.

8. A can coating machine comprising in combination a holder or support for the can and a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and contact with its inner periphery and with its head or heads and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, automatic mechanism for bringing said swab and can into operative relation with the swab inside the can, and in rubbing contact with its interior surface, and means for producing relative rotation between said swab and can, substantially as specified.

9. The combination with a can holder, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the swab and can into operative relation with the swab inside the can, and in rubbing contact with its interior surface, substantially as specified.

10. A can coating machine comprising in combination a holder or support for the can and a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to

enter the can and contact with its inner periphery and with its head or heads and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, automatic mechanism for bringing said swab and can into operative relation with the swab inside the can and in rubbing contact with its interior surface and means for feeding or supplying liquid lacquer or coating material to the swab, substantially as specified.

11. A can coating machine comprising in combination a holder or support for the can and a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and contact with its inner periphery and with its head or heads and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, automatic mechanism for bringing said swab and can into operative relation with the swab inside the can, and in rubbing contact with its interior surface, and means for producing relative rotation between said swab and can and means for feeding or supplying liquid lacquer or coating material to the swab, substantially as specified.

12. The combination with a can holder, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the swab and can into operative relation with the swab inside the can and in rubbing contact with its interior surface, and means for producing relative rotation between said swab and can, substantially as specified.

13. The combination with a can holder, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the swab and can into operative relation with the swab inside the can, and in rubbing contact with its interior surface, and means for producing relative rotation between said swab and can, and means for feeding or supplying liquid coating material to the swab, substantially as specified.

14. The combination with a can holder of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the mouth or opening of the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing

the swab and the can in said can holder into coöperative relation with each other with the swab inside the can, and in rubbing contact with its interior surface, means for rotating said can and swab, relatively to each other, and means for automatically delivering the cans to said holder, substantially as specified.

15. The combination with a can holder of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the mouth or opening of the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the swab and the can in said can holder into coöperative relation with each other with the swab inside the can and in rubbing contact with its interior surface, means for rotating said can and swab, relatively to each other, and means for automatically delivering the cans to said holder, and a can discharge runway, substantially as specified.

16. The combination with a can holder of a swab adapted to enter the mouth or opening of the can, means for bringing the swab and the can in said can holder into coöperative relation with each other with the swab inside the can, means for rotating said can and swab, relatively to each other, means for automatically delivering the cans to said holder, and a flame jet for flashing or igniting the vapors in and issuing from the freshly coated cans, substantially as specified.

17. In a machine of the character described, in combination: a reciprocating can coating device adapted to enter the interior of cans through the open ends thereof and apply a coating of material to the sides and end of the cans; and a device for igniting or flashing the cans immediately after they have been freshly coated, substantially as specified.

18. In a machine of the character described, in combination: a reciprocating can coating device adapted to enter the interior of a can through the open end thereof and apply a coating of material to the sides and end; a flame burner for igniting or flashing a freshly coated can and operating after the coating has been applied; and means for conveying a freshly coated can from the coating device to and past the flame burner with the open end of the can adjacent the flame burner, substantially as specified.

19. In a machine of the character described, in combination: a reciprocating can coating device adapted to enter the interior of a can through the open end thereof and apply a coating of material to the sides and end; a flame burner adapted to ignite or flash a freshly coated can and operating after the coating device has been operated;

and a runway for conveying the can from the coating device to and past the flame burner and with the open end of the can adjacent the flame burner, substantially as specified.

20. The combination with a can runway, of a movable carrier, a plurality of can holders on the carrier, means for rotating the cans in the can holders, a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, a device for feeding or supplying coating material to the swab, and means for reciprocating the swab, in rubbing contact with the interior surface of the can substantially as specified.

21. The combination with a can runway, of a movable carrier, a plurality of can holders on the carrier, means for rotating the cans in the can holder, a swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, a device for feeding or supplying coating material to the swab, and means for reciprocating the swab in and out of the can and while in the can, substantially as specified.

22. The combination with a can runway, of a movable carrier, a plurality of can holders on the carrier, means for rotating the cans in the can holder, a swab adapted to enter the can and apply a thin continuous film of coating material to the interior surface of the can, a device for feeding or supplying coating material to the swab, and means for reciprocating the swab and means for transversely or radially moving the swab while in the can, substantially as specified.

23. The combination with a can runway, of a movable carrier, a plurality of can holders on the carrier, means for rotating the cans in the can holder, a swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, a device for feeding or supplying coating material to the swab, means for reciprocating the swab in and out of the can and while in the can, and means for transversely or radially moving the swab while in the can, substantially as specified.

24. The combination with an intermittently rotating carrier, of a series of can holders on the carrier, means for automatically delivering the cans to said holders, a swab adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the swab and can into operative relation with the swab inside the can and means for

producing relative rotation between said swab and can, substantially as specified.

25. The combination with an intermittently rotating carrier, of a series of can holders on the carrier, means for automatically delivering the cans to said holders, a swab adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the swab and can into operative relation with the swab inside the can and means for rotating the can in respect to the swab, substantially as specified.

26. The combination with an intermittently rotating carrier, of a series of can holders on the carrier, means for automatically delivering the cans to said holders, a swab adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the swab and can into operative relation with the swab inside the can and means for rotating the can in respect to the swab, and means for reciprocating the swab while in the can, substantially as specified.

27. The combination with a can holder, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can, and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can and means for bringing the swab and can into operative relation with the swab inside the can and in rubbing contact with its interior surface and means for rotating the can, substantially as specified.

28. In an automatic machine, for coating the inside of cans with lacquer or protective material, the combination with a plurality of rotatable can holders, an intermittently movable carrier upon which said holders are mounted, a runway for delivering the cans to the holders, means for successively rotating the cans in the holders, a longitudinally reciprocating and transversely movable swab adapted to enter the can mouth or opening, a feed trough for the lacquer or coating material, a holder for said swab, a hollow perforated stem for said swab holder, a feed plunger communicating with said hollow stem, a longitudinally reciprocating slide for operating said swab, a transversely movable support for said slide, a discharge runway, a flame for flashing or igniting and sterilizing the freshly coated cans as they pass on the discharge runway and means for rotating the cans on said discharge runway, substantially as specified.

29. The combination with a can holder, of a swab having transverse and longitudinal faces for engagement with the end and

peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the swab and can into operative relation with the swab inside the can and in rubbing contact with its interior surface and a feed device for the liquid coating material, substantially as specified.

30. In a machine of the character described, in combination; a can holder; a swab adapted to enter the open end of a can while in the can holder and apply a thin, continuous coating of coating material to the interior surface of the can, said swab having transverse and longitudinal faces for engagement with the end and side surfaces of the can; means for bringing the swab and can into operative relation with the swab inside the can and in rubbing contact with the interior thereof; and means for feeding cans to said holder, substantially as specified.

31. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, and a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can substantially as specified.

32. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, a reciprocating swab adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for reciprocating the swab in and out of the can and also while in the can, substantially as specified.

33. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for reciprocating the swab in and out of the can and also while in the can, and means for transversely or radially moving the swab while in the can, substantially as specified.

34. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for re-

reciprocating the swab in and out of the can and also while in the can, means for transversely or radially moving the swab while in the can, and a can discharge runway, substantially as specified.

35. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for reciprocating the swab in and out of the can and also while in the can, means for transversely or radially moving the swab while in the can, a discharge runway and a flashing or igniting device, substantially as specified.

36. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, a reciprocating swab, means for reciprocating the swab in and out of the can and also while in the can, means for transversely or radially moving the swab while in the can, a discharge runway, a flashing or igniting device and a feed device for the liquid coating material, substantially as specified.

37. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, and a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, said can holders each comprising a pair of rotatable rollers, substantially as specified.

38. The combination with a can runway, of an intermittently movable can carrier a series of can holders on said carrier, means for successively rotating the cans, and a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, said can holders each comprising a pair of rotatable rollers provided with flanges at their ends, substantially as specified.

39. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, and a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, said means for rotating the cans consisting in an endless traveling belt engaging the can, substantially as specified.

40. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, and a re-

ciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, said can holders each comprising a pair of rotatable rollers, said means for rotating the cans consisting in an endless traveling belt engaging the can, substantially as specified.

41. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, and a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, said can holders each comprising a pair of rotatable rollers provided with flanges at their ends, said means for rotating the cans consisting in an endless traveling belt engaging the can, substantially as specified.

42. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, a reciprocating swab, and means for feeding or supplying liquid coating material, substantially as specified.

43. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for feeding or supplying liquid coating material to the outer longitudinal edge of said swab, substantially as specified.

44. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for feeding or supplying liquid coating material to the inner or upper part of said swab, substantially as specified.

45. The combination with a can runway, of an intermittently movable can carrier, a series of can holders on said carrier, means for successively rotating the cans, a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for feeding or supplying liquid coating material and a discharge runway for the cans, substantially as specified.

46. The combination with a can runway, of an intermittently movable carrier, a series of can holders on said carrier, means for successively rotating the cans, a reciprocating

cating swab, means for feeding or supplying liquid coating material, a discharge runway for the cans, and an igniting device for flashing and sterilizing the freshly coated cans, substantially as specified.

47. The combination with oppositely moving devices for supporting and rotating a can, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the can and swab into operative relation with the swab inside the can, and in rubbing contact with its interior surface substantially as specified.

48. The combination with oppositely moving devices for supporting and rotating a can, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the can and swab into operative relation with the swab inside the can, and in rubbing contact with its interior surface and means for feeding or supplying liquid coating material, substantially as specified.

49. The combination with oppositely moving devices for supporting and rotating a can, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the can and swab into operative relation with the swab inside the can and in rubbing contact with its interior surface and a can delivery device, substantially as specified.

50. The combination with oppositely moving devices for supporting and rotating a can, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the can and swab into operative relation with the swab inside the can and in rubbing contact with its interior surface and a can discharge device, substantially as specified.

51. The combination with oppositely moving devices for supporting and rotating a can, of a swab, means for bringing the can and swab into operative relation with the swab inside the can, a can discharge device and a flashing or igniting device, substantially as specified.

52. The combination with oppositely moving devices for supporting and rotating a can, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the can and swab into operative relation with the swab inside the can, and in rubbing contact with its interior surface, means for feeding or supplying liquid coating material and a can delivery device, substantially as specified.

53. The combination with oppositely moving devices for supporting and rotating a can, of a swab adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for bringing the can and swab into operative relation with the swab inside the can, means for feeding or supplying liquid coating material, a can delivery device and a can discharge device, substantially as specified.

54. The combination with oppositely moving devices for supporting and rotating a can, of a swab and means for bringing the can and swab into operative relation with the swab inside the can, means for feeding or supplying liquid coating material, a can delivery device, a can discharge device and a flashing or igniting device, substantially as specified.

55. The combination with oppositely moving devices between and by which the can is supported and rotated, of a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and means for reciprocating said swab in rubbing contact with the interior surface of the rotating can substantially as specified.

56. The combination with oppositely moving devices between and by which the can is supported and rotated, of a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and a feed device for liquid coating material, and means for reciprocating said swab in rubbing contact with the interior surface of the rotating can substantially as specified.

57. The combination with oppositely moving devices between and by which the can is supported and rotated, of a reciprocating swab adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and a can delivery device, and means for reciprocating said swab in rubbing contact with the interior surface of the rotating can substantially as specified.

58. The combination with oppositely moving devices between and by which the can is supported and rotated, of a reciprocating swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, and a can discharge device, and means for reciprocating said swab in rubbing contact with the interior surface of the rotating can substantially as specified.
59. The combination with oppositely moving devices between and by which the can is supported and rotated, of a reciprocating swab, a can discharge device and a can flashing or igniting device, substantially as specified.
60. The combination with a can supporting means, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the can and swab into operative relation with the swab inside the can, and means for imparting relative rotation between said swab and can, substantially as specified.
61. The combination with a can supporting means, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the can and swab into operative relation with the swab inside the can, and in rubbing contact with its interior surface, means for imparting relative rotation between said swab and can and a feed trough for the liquid coating material, substantially as specified.
62. The combination with a can supporting means, of a swab, adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the can and swab into operative relation with the swab inside the can, means for imparting relative rotation between said swab and can, a feed trough for the liquid coating material and means for maintaining the liquid coating material at a constant level in said feed trough, substantially as specified.
63. The combination with a can supporting means, of a swab, means for bringing the can and swab into operative relation with the swab inside the can, means for imparting relative rotation between said swab and can, a feed trough for the liquid coating material, means for maintaining the liquid coating material at a constant level in said feed trough and a tank for the liquid coating material, substantially as specified.
64. The combination with a can supporting means, of a swab, means for bringing the can and swab into operative relation with the swab inside the can, means for imparting relative rotation between said swab and can and a feed trough for the liquid coating material, a closed tank, a feed pipe and a vent or air pipe connecting said tank and trough, substantially as specified.
65. The combination with a can supporting means, of a swab, means for bringing the can and swab into operative relation with the swab inside the can, means for imparting relative rotation between said swab and can, a feed trough for the liquid coating material, a closed tank, a feed pipe and a vent or air pipe connecting said tank and trough, said feed trough having a well and an overflow lip, substantially as specified.
66. The combination with a can supporting means, of a swab, means for bringing the can and swab into operative relation with the swab inside the can, means for imparting relative rotation between said swab and can, and a feed trough for the liquid coating material, a closed tank, a feed pipe and a vent or air pipe connecting said tank and trough, said feed trough having a well and the lower end of said feed pipe extending below the level of the lower end of said vent or air pipe, substantially as specified.
67. The combination with a can supporting means, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the can and swab into operative relation with the swab inside the can, and in rubbing contact with its interior surface, means for imparting relative rotation between said swab and can, a feed device for the coating material and a pipe connecting said feed device with said swab, substantially as specified.
68. The combination with a can supporting means, of a swab having transverse and longitudinal faces for engagement with the end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the can and swab into operative relation with the swab inside the can, and in rubbing contact with its interior surface, means for imparting relative rotation between said swab and can, a feed device for the coating material, a pipe connecting said feed device with said swab and a tank and feed pipe leading to said feed device, substantially as specified.
69. The combination with a can supporting means, of a swab having transverse and longitudinal faces for engagement with the

end and peripheral surfaces of a can and adapted to enter the can and apply a thin continuous coating or film of liquid lacquer or coating material to the interior surface of the can, means for bringing the can and swab into operative relation with the swab inside the can, and in rubbing contact with its interior surface, means for imparting relative rotation between said swab and can, a holder for said swab having a hollow perforated stem, and a liquid coating material supply communicating therewith, substantially as specified.

70. In a can coating machine, the combination with a can coating device adapted to enter the interior of cans through the open ends thereof for supplying and distributing liquid coating material over the interior surface of cans, of an igniting device for flashing and sterilizing the freshly coated cans, and means for reciprocating said can coating device substantially as specified.

71. In a can coating machine, the combination with a can coating device adapted to enter the interior of cans through the open ends thereof for supplying and distributing liquid coating material over the interior surface of cans, of an igniting device for flashing and sterilizing the freshly coated cans and a runway for the cans adjacent to said igniting device, and means for reciprocating said can coating device substantially as specified.

72. In a can coating machine, the combination with a pair of rotating can holding rollers, of a belt for rotating the can, and means for applying a thin continuous film of coating material to the interior surface of the rotating can, substantially as specified.

73. In a can coating machine, the combination with a pair of rotating can holding rollers, of a belt for rotating the can, means for applying coating material to the interior surface of the rotating can, and a runway for delivering the cans to said can holding rollers, substantially as specified.

74. In a can coating machine, the combination with a pair of rotating can holding rollers, of a belt for rotating the can, means for applying coating material to the interior surface of the rotating can, a runway for delivering the cans to said can holding rollers and an igniting device, substantially as specified.

75. In a can coating machine, the combination with a pair of rotating can holding rollers, of a belt for rotating the can, means for applying a thin continuous film of coating material to the interior surface of the rotating can, a runway for delivering the cans to said can holding rollers and a can discharge runway, substantially as specified.

76. In a can coating machine, the combination with a pair of rotating can holding rollers, of a belt for rotating the can, means

for applying coating material to the interior surface of the rotating can, a runway for delivering the cans to said can holding rollers, a can discharge runway and an igniting device adjacent to said can discharge runway, substantially as specified.

77. In a can coating machine, the combination with a carrier, of a plurality of pairs of can holding rollers thereon, and a device adapted to enter the cans and apply a thin continuous film of coating material to the interior surface of the cans substantially as specified.

78. In a can coating machine, the combination with a carrier, of a plurality of pairs of can holding rollers thereon, having flanges at their outer ends to hold the cans in position longitudinally, and a device adapted to enter the cans and apply a thin continuous film of coating material to the interior surface of the cans substantially as specified.

79. In a can coating machine, the combination with a carrier, of a plurality of pairs of can holding rollers thereon and a can delivery runway, and a device adapted to enter the cans and apply a thin continuous film of coating material to the interior surface of the cans substantially as specified.

80. In a can coating machine, the combination with a carrier, of a plurality of pairs of can holding rollers thereon and a belt for rotating the cans on said can holding rollers, and a device adapted to enter the cans and apply a thin continuous film of coating material to the interior surface of the cans substantially as specified.

81. In a can coating machine, the combination with a carrier, of a plurality of pairs of can holding rollers thereon and a belt for rotating the cans on said can holding rollers and a can delivery runway, and a device adapted to enter the cans and apply a thin continuous film of coating material to the interior surface of the cans substantially as specified.

82. In a can coating machine, the combination with a carrier, of a plurality of pairs of can holding rollers thereon and a belt for rotating the cans on said can holding rollers, a can delivery runway and a can discharge runway, and a device adapted to enter the cans and apply a thin continuous film of coating material to the interior surface of the cans substantially as specified.

83. In a can coating machine, the combination with a carrier, of a plurality of pairs of can holding rollers thereon and a belt for rotating the cans on said can holding rollers, a can delivery runway, a can discharge runway and an igniting device adjacent to said discharge runway, substantially as specified.

84. In a can coating machine, the combination with a carrier, of a plurality of pairs of can holding rollers thereon and a belt for rotating the cans on said can holding rollers,

a can delivery runway, a can discharge runway, an igniting device adjacent to said discharge runway, and means for applying coating material to the interior surface of the can, substantially as specified.

85. In a can lacquering or coating machine, the combination with a can feeding device, of a can coating device, a can discharging device and a can flashing device, said devices operating upon each can successively and operating upon different cans simultaneously at different stations, and means for reciprocating said can coating device substantially as specified.

86. In a machine for applying a protective coating to the interior surfaces of sheet metal cans, the combination with a can runway, of a reciprocating can coating device adapted to enter the open ends of the cans and apply to the interior surfaces thereof a thin film of liquid coating material, means for feeding and registering the cans in line with said coating device, means

for rotating the cans while being operated upon by said coating device, and an igniting device for flashing the cans as they roll along the runway with their open ends adjacent to said igniting device, substantially as specified.

87. The combination with a can runway, of an igniting device for flashing the cans as they roll along the runway with their open ends adjacent to said igniting device, a reciprocating can coating device adapted to enter the open ends of the cans and apply a thin film of liquid coating material to the interior surfaces of the cans, and can rotating means in registry with said coating device, and means for delivering the cans to said can rotating means, substantially as specified.

JOHN G. HODGSON.

Witnesses:

H. M. MUNDAY,
EDMUND ADCKOCK.