

1,013,858.

7 SHEETS—SHEET 1.

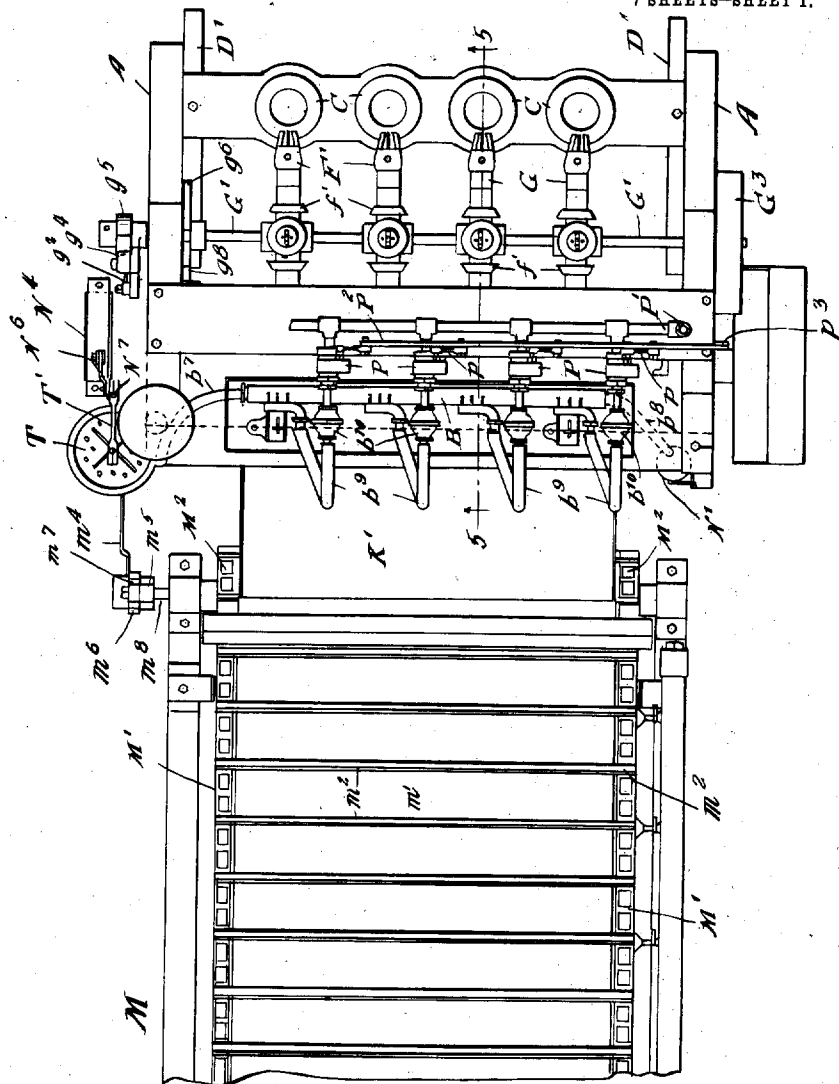


Fig. 1

Wm. Geiger
St. W. Monday

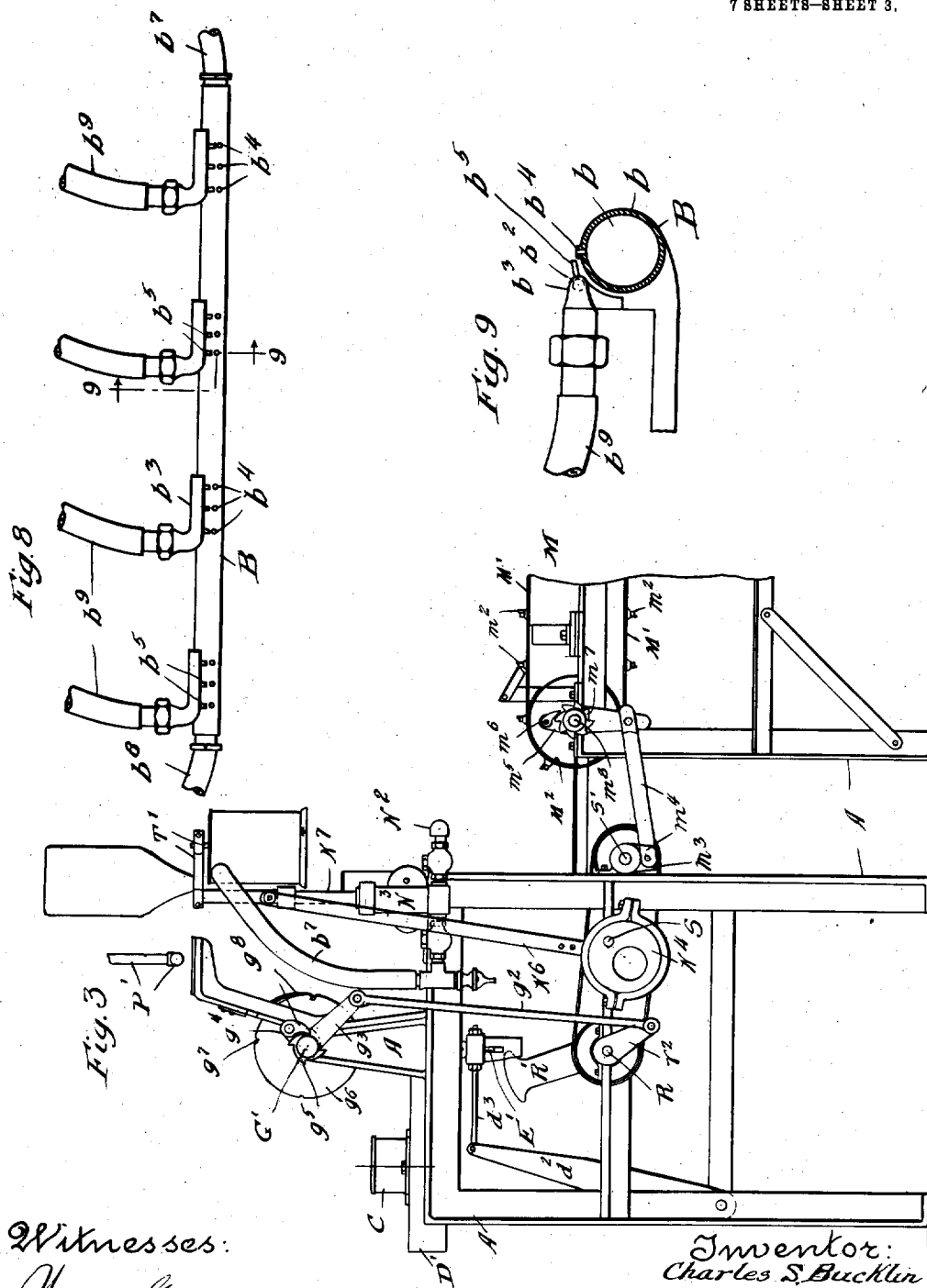
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By Munday, Pratt, Alden & Co.,
Attorneys

C. S. BUCKLIN.
CAN CAP LACQUERING OR COATING MACHINE.
APPLICATION FILED MAY 13, 1908.

1,013,858.

Patented Jan. 9, 1912.

7 SHEETS—SHEET 3.



Witnesses:

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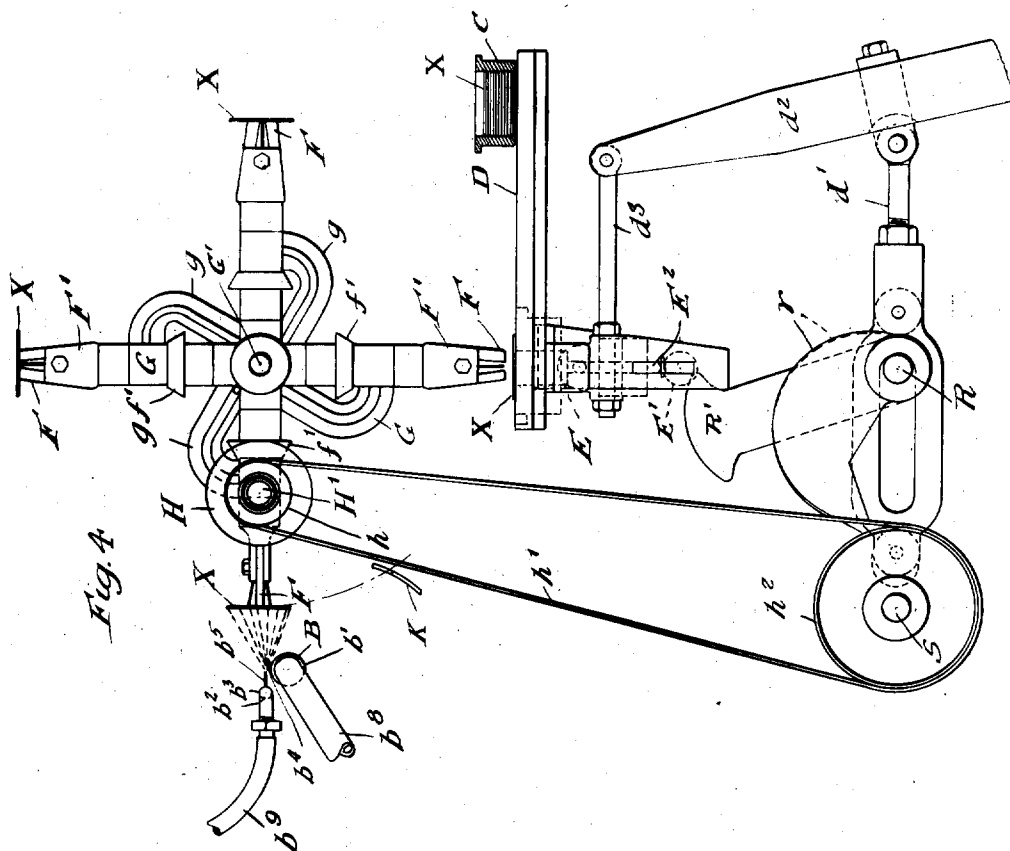
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7 SHEETS—SHEET 4.



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1,013,858.

7 SHEETS—SHEET 5.



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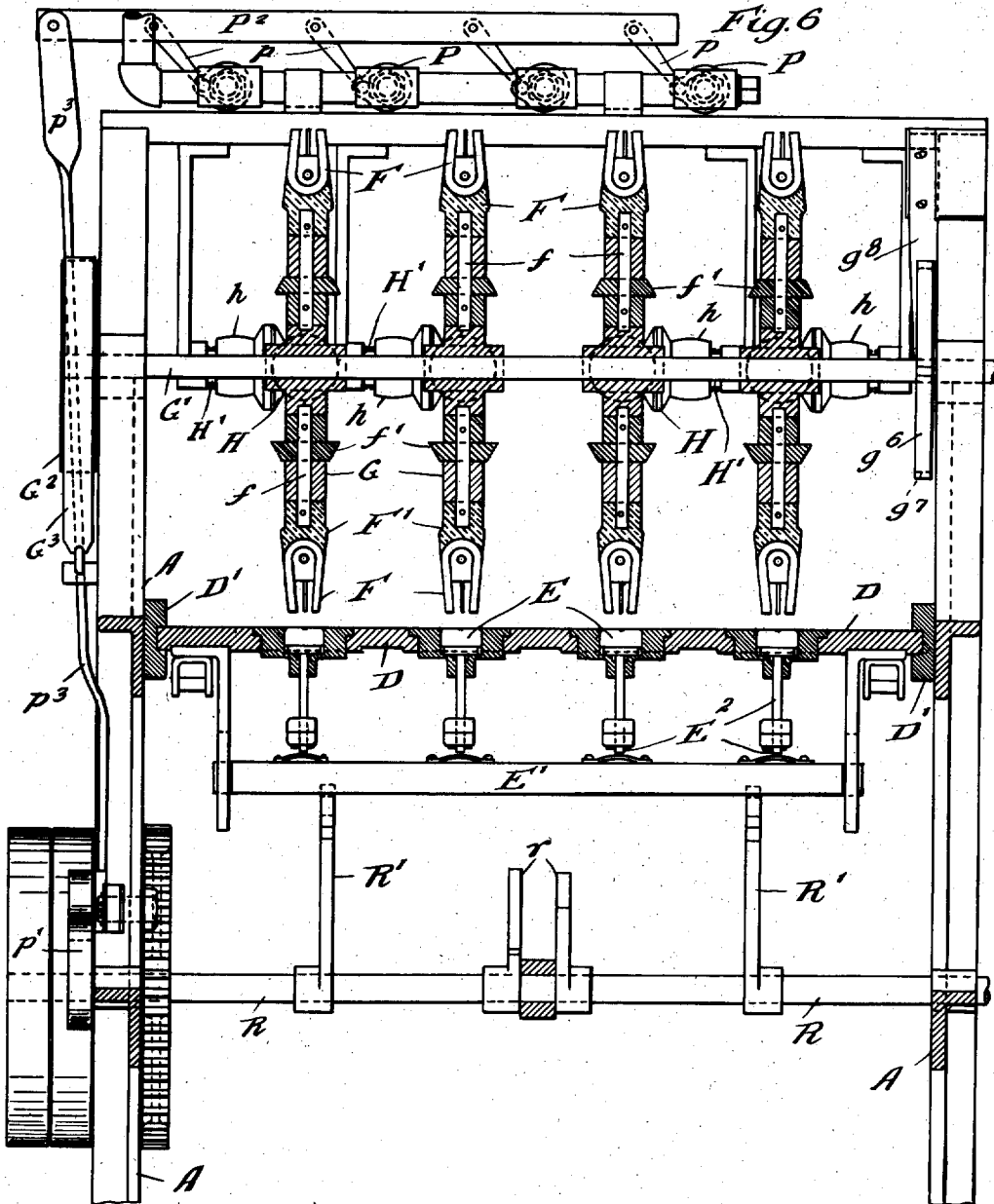
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APPLICATION FILED MAY 13, 1908.

1,013,858.

Patented Jan. 9, 1912.

7 SHEETS—SHEET 6.



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UNITED STATES PATENT OFFICE.

CHARLES S. BUCKLIN, OF BALTIMORE, MARYLAND, ASSIGNOR TO AMERICAN CAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CAN-CAP LACQUERING OR COATING MACHINE.

1,013,858.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed May 13, 1908. Serial No. 432,691.

To all whom it may concern:

Be it known that I, CHARLES S. BUCKLIN, a citizen of the United States, residing in Baltimore, in the State of Maryland, have invented a new and useful Improvement in Can-Cap Lacquering or Coating Machines, of which the following is a specification.

My invention relates to improvements in can lacquering or coating machines.

10 The object of my invention is to provide an automatic machine of a simple, efficient and durable construction, by means of which the inner faces of can caps may be rapidly and cheaply lined or coated with lacquer or other protective coating.

15 The machine embodying my invention comprises in cooperative combination, a plurality of spraying devices, a plurality of can cap magazines or hoppers, a plurality of can cap feeders, a plurality of can cap lifters, a plurality of can cap holder spiders or carriers furnished with a plurality of rotatable can cap holders, means for rotating the holders on each of the carriers or spiders when each in turn is brought into cooperative relation with the spraying devices, stripping or ejecting devices for stripping the sprayed caps from the holders and delivering the same with their coated faces upward to a drier and a conveyer for moving the coated caps in or on the drier.

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

35 In the accompanying drawing forming a part of this specification, Figure 1 is a plan view of a can cap lacquering or coating machine embodying my invention, a portion of the drying mechanism being broken away. 40 Fig. 2 is a partial side elevation. Fig. 3 is a partial side elevation looking from the opposite side to that shown in Fig. 2. Fig. 4 is an enlarged detail side elevation showing the mechanism for operating the can cap feed slide and the can cap lifters and showing one of the can cap holders or magazines in section. Fig. 5 is an enlarged detail vertical section on line 5—5 of Fig. 1. Fig. 6 45 is an enlarged detail vertical section on line 6—6 of Fig. 5. Fig. 7 is an enlarged detail plan with certain parts broken away and partly in horizontal section on line 7—7 of Fig. 5. Fig. 8 is an enlarged detail plan

view of the spray heads and Fig. 9 is an enlarged detail section on line 9—9 of Fig. 8.

55 In the drawing, A represents the frame of the machine, B the spray heads or spraying devices, C the cap magazines or hoppers, D the reciprocating cap feeders, E the vertically movable can cap lifters, F the rotating can cap holders, G the intermittently rotating carriers or spiders upon which the rotatable cap holders F are journaled or mounted, H the devices for rotating the cap holders, K the strippers or ejecting devices for removing the freshly coated caps from the holders, K¹ the connecting chute for delivering the freshly coated caps to the drier, M the drier, M¹ the conveyer of the drier, N 60 the supply tank for the liquid lacquer or coating material, and P the valves or devices for automatically regulating and controlling the amount of liquid lacquer or coating material sprayed upon each can cap. 75

In the drawing I have shown the preferred construction of each of the principal parts or devices which are combined together to embody my invention in an automatic machine. 80

Each of the spray heads or spraying devices B consists essentially of a liquid chamber *b* formed by a pipe or casing *b*¹, an air chamber *b*² formed by a pipe or casing *b*³, a plurality of upright or vertically disposed liquid nozzles or nipples *b*⁴, preferably three 85 in number, and a corresponding series or plurality of horizontally disposed air-blast nozzles *b*⁵ arranged substantially at right angles to the liquid nozzles. 90

The liquid chamber pipe or casing *b*¹ has a contracted overflow or discharge so that the liquid lacquer or coating material may constantly fill the same and thus be maintained at a constant level in respect to the lower ends of the liquid nozzles *b*⁴. The liquid lacquer or coating material flows from the supply tank N into the liquid chamber *b* through a supply pipe *b*⁷ and overflows from said liquid chamber *b* through the overflow pipe *b*⁸ into a drip tank N¹ from which it is pumped back into the supply tank N through the return pipe N² by a pump N³. Preferably a single liquid chamber casing or pipe *b*¹ may be employed for each group of liquid nozzles or spray heads. 105 A separate air chamber casing *b*³, however, is preferably employed for each group of

air nozzles b^5 , and the same is connected to the common compressed air supply pipe P' by branch pipes b^9 , each of which is furnished with a pressure equalizer enlargement or coupling b^{10} , and with a valve or pressure controlling device P . Each of the can cap magazines or hoppers C preferably consists of an open bottom cylinder conforming in interior diameter to the exterior diameter of the can caps X , which are placed in the magazine with their outer faces uppermost so that the inner face of each cap which is to receive the lacquer or protective coating will be lowermost.

15 The can cap feeders D each preferably consists of a reciprocating slide, having a lip or shoulder d , adapted to engage the lowermost cap only in the magazine C and slide it forward over the cap lifter E . The cap feeder D reciprocates back and forth on a suitable guide D^1 on the stationary frame of the machine, and is preferably operated by a cam r on the cam shaft R through the connecting link d^1 , lever d^2 and connecting link d^3 .

Each of the cap lifters E preferably consists of a vertically reciprocating head which is moved up and down by means of a cam R^1 on the cam shaft R , which engages bar E^1 on the stem E^2 of the cap lifter E . The cap lifter E serves to lift or raise each can cap upward so that it will be properly grasped by the rotatable cap holder F on the carrier G when the feeder D moves the cap X over the lifter E .

Each of the rotatable can cap holders F preferably consists of a permanent electromagnet secured in a rotatable head F^1 , the shaft or spindle f of which is journaled in the arm g of the carrier or spider G , and is furnished with a bevel friction gear or wheel f^1 adapted to engage a suitable friction wheel or device H for rotating the holder and the cap when the carrier G moves the holder F and can cap thereon into cooperative relation with the spraying device or head B .

Each of the carriers or spiders G is preferably furnished with four arms g , and thus carries four of the rotatable holders F so that the several holders F on each carrier or spider G will have their axes at right angles to each other, and so that one holder F may be in an upright position suitable for receiving a cap from the lifter E while another holder F will have its axis horizontal and in proper position for presenting the cap thereon to the spray head B and rotating it in a vertical plane. The carriers or spiders G are preferably four in number, corresponding with the number of the spray heads B and they are all mounted upon or secured to the same operating shaft G^1 , which is intermittently turned by any suitable operating mechanism, the same

preferably consisting in a crank arm r^2 on the cam shaft R , connected by a link g^2 with a pawl lever g^3 having a pawl g^4 which engages a ratchet g^5 on the shaft G^1 of the carriers or spiders G . The shaft G^1 is further provided with a registering or locking wheel g^6 , the notches g^7 of which engage a spring registering pawl g^8 to cause the operating mechanism of the carriers G to bring the holders F accurately into register with the cap lifter E and spraying head B .

Each of the devices H for automatically rotating the cap holders F preferably consists of a conical or friction gear or wheel secured to a shaft H^1 and arranged in operative relation to the friction gear or wheel f^1 on the spindle of the cap holder head F^1 when the carrier G brings each cap holder F into position for cooperation with the spray head B . The shaft H^1 of the cap holder rotating devices H is preferably continuously rotated by means of a pulley h on said shaft H^1 and a belt h^1 and pulley h^2 on the driving shaft S .

The strippers or ejecting devices K for stripping or discharging the freshly coated caps X from the magnetic cap holders F as the carrier G rotates, preferably consist of curved fingers secured to or formed integral with the connecting chute K^1 and projecting from the upper edge thereof and adapted to fit astride the cap holders F and engage the outer edges of the can caps X . The connecting chute K^1 and strippers K are so arranged and combined with the carrier G and cap holders F that the caps as they are freed from the holders slide down the connecting chute with their freshly coated faces uppermost.

The drier M preferably consists of a long horizontal heating chamber furnished with gas burners or other heaters m and having a top plate m^1 along which the coated caps X are conveyed by a flexible or endless chain conveyer M^1 traveling on pulleys or sprocket wheels M^2 , the links of the chain being furnished with cross bars m^2 adapted to engage the can caps and shove them along the heated top plate of the drier. The connecting chute K^1 is arranged at an acute angle to the top plate and conveyer of the drier so that the freshly coated caps will slide directly onto the same without danger of being turned over. The conveyer M^1 is preferably intermittently operated by a step by step movement by means of a crank arm m^3 on the shaft S through a connecting link m^4 , pawl lever m^5 having pawls m^6 engaging a ratchet m^7 on the shaft m^8 of one of the conveyer pulleys M^2 .

Each of the valves or devices P for automatically regulating and controlling the amount of liquid lacquer or coating material sprayed upon the inner face of each can cap, is preferably automatically operated

by means of a valve lever p pivotally connected to a common operating bar P^2 which is actuated at suitable intervals as required by means of a cam p^1 on the shaft R, cam lever p^2 and connecting link p^3 .

The can cap holder carrier shaft G^1 is preferably furnished with a brake wheel G^2 and a strap or other brake G^3 having a spring or tension device G^4 .

The pump N^2 by which the surplus or overflowing liquid lacquer is returned to the supply tank N is preferably operated by means of an eccentric N^4 on the shaft S and which is connected by a link N^5 with the piston rod N^7 of the pump.

The liquid supply tank N is preferably furnished with an agitator or stirring device T which may preferably be operated by a connection T^1 from the piston of the pump.

I claim:—

1. In a can cap lacquering or coating machine, the combination with a spraying device, of a magazine for the can caps, a can cap feeder, a can cap lifter, a series of magnetic rotatable can cap holders, a carrier upon which said cap holders are mounted and by which said holders are automatically brought into coöperative relation with the spraying device, substantially as specified.

2. In a can cap lacquering or coating machine, the combination with a spraying device, of a magazine for the can caps, a can cap feeder, a can cap lifter, a series of magnetic rotatable can cap holders, a carrier upon which said cap holders are mounted and by which said holders are automatically brought into coöperative relation with the spraying devices, and means for successively rotating the can cap holders as they are presented to the spraying device, substantially as specified.

3. In a can cap lacquering or coating machine, the combination with a spraying device, of a magazine for the can caps, a can cap feeder, a can cap lifter, a series of magnetic rotatable can cap holders, a carrier upon which said cap holders are mounted and by which said holders are automatically brought into coöperative relation with the spraying device, means for successively rotating the can cap holders as they are presented to the spraying device and a stripping device, substantially as specified.

4. In a can cap lacquering or coating machine, the combination with a spraying device, of a magazine for the can caps, a can cap feeder, a can cap lifter, a series of magnetic rotatable can cap holders, a carrier upon which said cap holders are mounted and by which said holders are automatically brought into coöperative relation with the spraying device, means for successively rotating the can cap holders as they are presented to the spraying device, a stripping

device, a drier and a connecting chute extending from the stripping device to the drier, substantially as specified.

5. In a can cap lacquering or coating machine, the combination with a spraying device, of a magazine for the can caps, a can cap feeder, a can cap lifter, a series of magnetic rotatable can cap holders, a carrier upon which said cap holders are mounted and by which said holders are automatically brought into coöperative relation with the spraying device, means for successively rotating the can cap holders as they are presented to the spraying device, a stripping device, a drier and a connecting chute extending from the stripping device to the drier, said drier having an intermittently moving conveyer for the can caps, substantially as specified.

6. In a can cap lacquering or coating machine, the combination with a spraying device, of a magazine for the can caps, a can cap feeder, a can cap lifter, a series of magnetic rotatable can cap holders, a carrier upon which said cap holders are mounted and by which said holders are automatically brought into coöperative relation with the spraying device, a compressed air supply pipe for the spray head, a valve therefor and means for automatically operating said valve to control the amount of lacquer sprayed upon the can cap, substantially as specified.

7. In a can cap lacquering or coating machine, the combination with a series of spray heads, of a series of intermittently moving cap holder carriers each furnished with a plurality of rotatable cap holders, each of said cap holders on each carrier being rotated in turn at intervals and means for simultaneously rotating a cap holder on each of said carriers in coöperative relation with said spraying devices, substantially as specified.

8. In a can cap lacquering or coating machine, the combination with a series of spray heads, of a series of intermittently moving cap holder carriers, each furnished with a plurality of rotatable cap holders, a series of can cap feeders and a series of magazines for the can caps, substantially as specified.

9. In a can cap lacquering or coating machine, the combination with a plurality of spray heads, of a plurality of carriers and a plurality of rotatable magnetic cap holders on each of said carriers, substantially as specified.

10. In a can cap lacquering or coating machine, the combination with a plurality of spray heads, of a plurality of carriers and a plurality of rotatable magnetic cap holders on each of said carriers and a plurality of cap lifters, substantially as specified.

11. In a can cap lacquering or coating machine, the combination with a plurality of

spray heads, of a plurality of carriers and a plurality of rotatable magnetic cap holders on each of said carriers, a plurality of cap lifters and a plurality of cap feeders, substantially as specified.

12. In a can cap lacquering or coating machine, the combination with a plurality of spray heads, of a plurality of carriers, a plurality of rotatable magnetic cap holders on each of said carriers, a plurality of cap lifters, a plurality of cap feeders and a plurality of cap magazines, substantially as specified.

13. In a can cap lacquering or coating machine, the combination with a plurality of spray heads, of a plurality of carriers, a plurality of rotatable magnetic cap holders on each of said carriers, a plurality of cap lifters, a plurality of cap feeders, a plurality of cap magazines and means for stripping a plurality of can caps from a plurality of said holders, substantially as specified.

14. In a can cap lacquering or coating ma-

chine, the combination with a plurality of spray heads, of a plurality of carriers, a plurality of rotatable magnetic cap holders on each of said carriers, a plurality of cap lifters, a plurality of cap feeders, a plurality of cap magazines, means for stripping a plurality of can caps from a plurality of said holders, a connecting chute and a drier having an intermittently moving conveyer for the can caps, substantially as specified.

15. In a machine for lacquering or lining can caps, the combination with a spraying device rotatable about a horizontal axis, of a cap holding device, means for rotating said cap holding device, means for drying the freshly coated caps and means for delivering the freshly coated caps to said drying means with their coated faces uppermost, substantially as specified.

CHARLES S. BUCKLIN.

Witnesses:

HENRY M. LAWS,
WM. F. NEKLER.

Correction in Letters Patent No. 1,013,858.

It is hereby certified that in Letters Patent No. 1,013,858, granted January 9, 1912, upon the application of Charles S. Bucklin, of Baltimore, Maryland, for an improvement in "Can-Cap Lacquering or Coating Machines," an error appears in the printed specification requiring correction as follows: Page 4, line 36, strike out the words "rotatable about a horizontal axis" and insert same after the word "device," in line 37, same page; and that the proper corrections have been made in the files and records of this office and are hereby made in said Letters Patent.

Signed and sealed this 4th day of June, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

spray heads, of a plurality of carriers and a plurality of rotatable magnetic cap holders on each of said carriers, a plurality of cap lifters and a plurality of cap feeders, substantially as specified.

12. In a can cap lacquering or coating machine, the combination with a plurality of spray heads, of a plurality of carriers, a plurality of rotatable magnetic cap holders on each of said carriers, a plurality of cap lifters, a plurality of cap feeders and a plurality of cap magazines, substantially as specified.

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14. In a can cap lacquering or coating machine, the combination with a plurality of

spray heads, of a plurality of carriers, a plurality of rotatable magnetic cap holders on each of said carriers, a plurality of cap lifters, a plurality of cap feeders, a plurality of cap magazines, means for stripping a plurality of can caps from a plurality of said holders, a connecting chute and a drier having an intermittently moving conveyer for the can caps, substantially as specified.

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