N. TROYER.

COMPOUND APPLYING AND DRYING MACHINE.

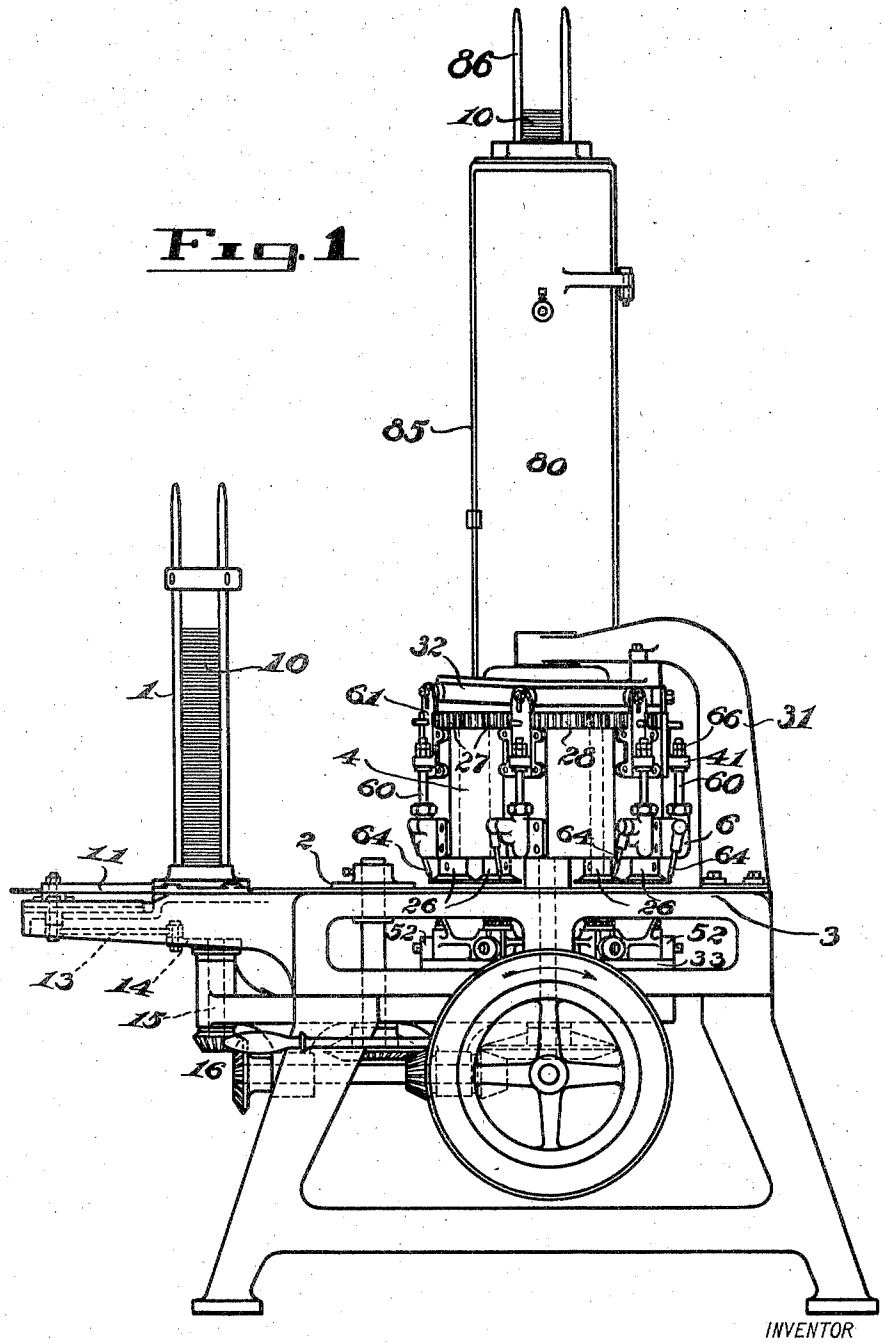
APPLICATION FILED JUNE 18, 1917.

1,308,208.

Patented July 1, 1919.

5 SHEETS—SHEET 1.

Fig. 1



INVENTOR

Nelson Troyer

By Henry L. Reynolds.

ATTORNEY

N. TROYER.

COMPOUND APPLYING AND DRYING MACHINE.

APPLICATION FILED JUNE 18, 1917.

1,308,208.

Patented July 1, 1919.

5 SHEETS—SHEET 2.

Fig. 6

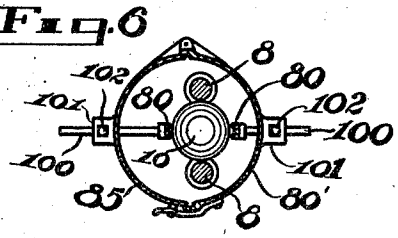


Fig. 2.

INVENTOR

Nelson Troyer

By Henry L. Reynolds.

ATTORNEY.

N. TROYER.

COMPOUND APPLYING AND DRYING MACHINE.

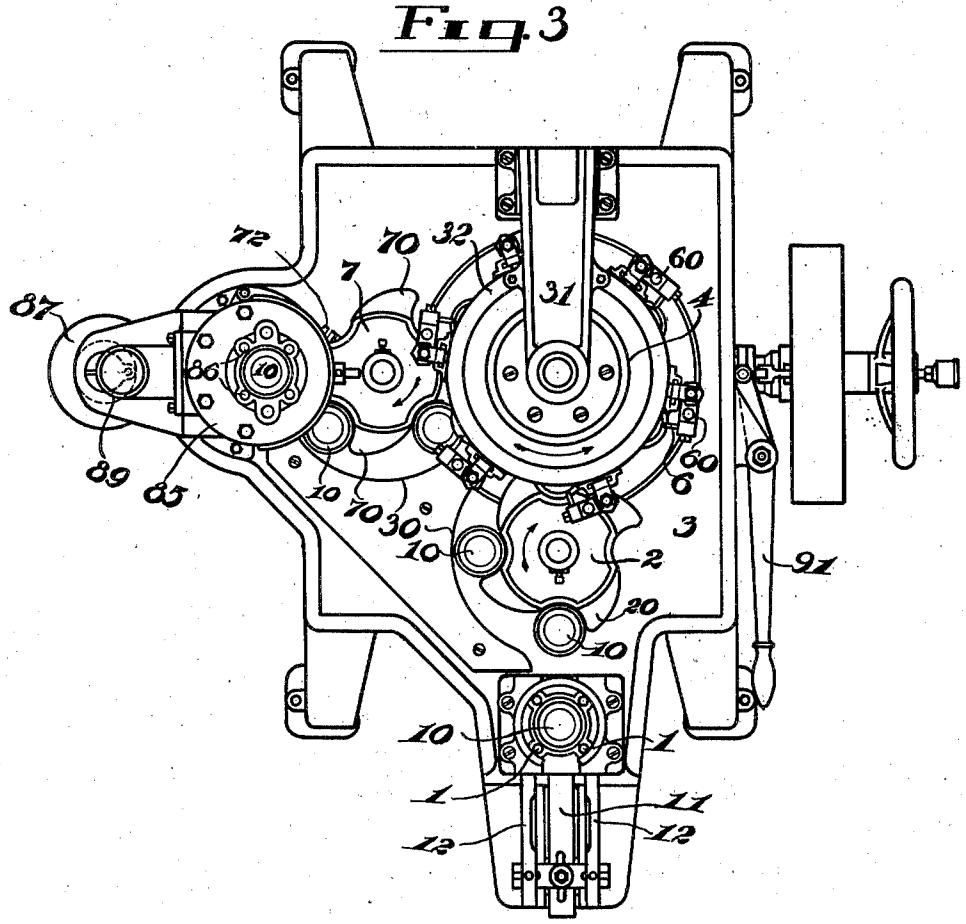
APPLICATION FILED JUNE 18, 1917.

1,308,208.

Patented July 1, 1919.

5 SHEETS—SHEET 3.

Fig. 3



INVENTOR

Nelson Troyer

By Henry L. Reynolds.

ATTORNEY

N. TROYER.

COMPOUND APPLYING AND DRYING MACHINE.

APPLICATION FILED JUNE 18, 1917.

1,308,208.

Patented July 1, 1919.

5 SHEETS—SHEET 4.

Fig. 4

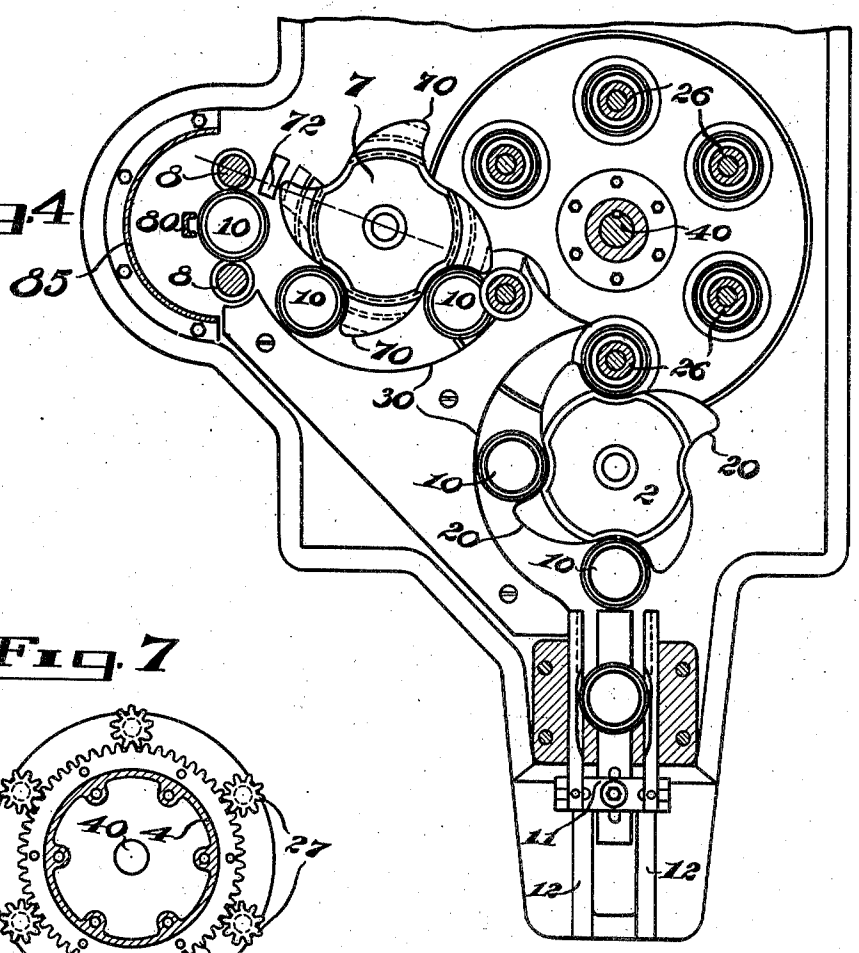
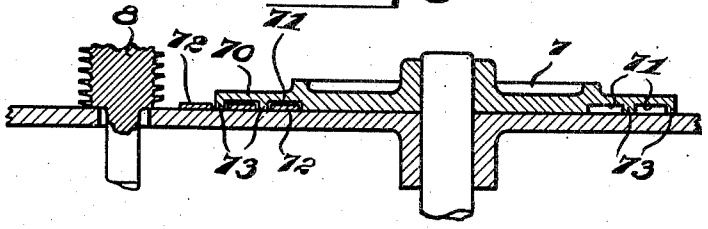


Fig. 7

Fig. 8



INVENTOR

Nelson Troyer

By Henry L. Reynolds

ATTORNEY

N. TROYER.

COMPOUND APPLYING AND DRYING MACHINE.

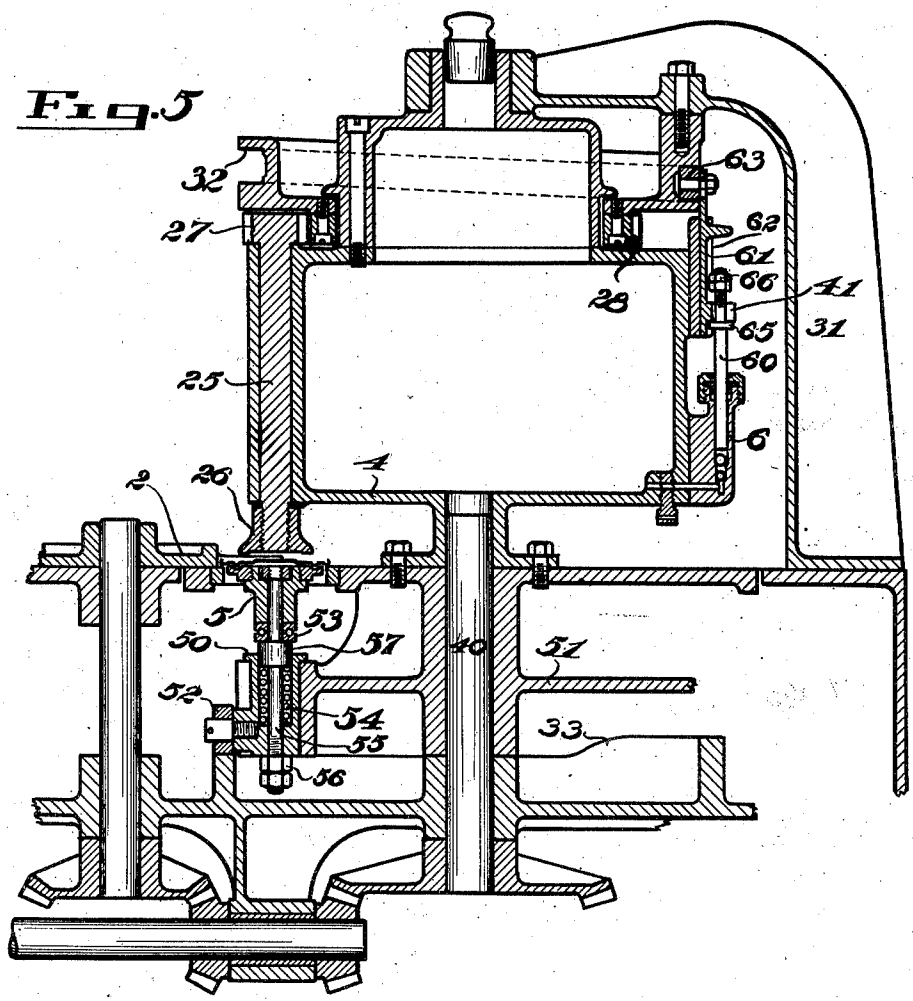
APPLICATION FILED JUNE 18, 1917.

1,308,208.

Patented July 1, 1919.

5 SHEETS—SHEET 5.

Fig. 5



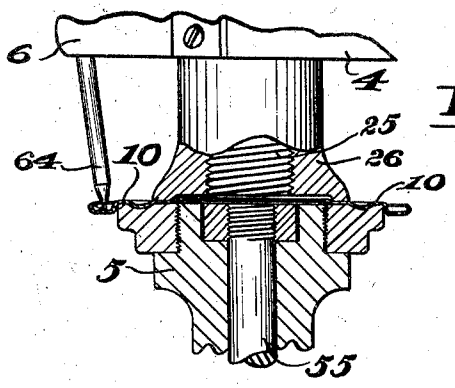


Fig. 9

INVENTOR

Nelson Troyer

By Henry L. Reynolds

ATTORNEY

UNITED STATES PATENT OFFICE.

NELSON TROYER, OF SEATTLE, WASHINGTON, ASSIGNOR TO SEATTLE ASTORIA IRON WORKS, OF SEATTLE, WASHINGTON, A CORPORATION OF WASHINGTON.

COMPOUND APPLYING AND DRYING MACHINE.

1,308,208. Specification of Letters Patent. Patented July 1, 1919.

Application filed June 18, 1917. Serial No. 175,406.

To all whom it may concern:

Be it known that I, NELSON TROYER, a citizen of the United States, and resident of the city of Seattle, county of King, and State of Washington, have invented certain new and useful Improvements in Compound Applying and Drying Machines, of which the following is a specification.

My invention relates to machines employed for the purpose of applying a thin coating of a sealing compound to the flanges of the caps for tin cans, whereby, when the caps have been clamped in place upon the cans the integrity of the joint is assured.

The object of my invention is to provide an apparatus for doing this work which will do the same more efficiently and effectively and particularly as to the rate of accomplishing the work and the character of the work when finished.

My invention comprises the novel parts and combinations of parts which will be herein described and then particularly defined by the claims.

In the accompanying drawings I have shown a machine in which my invention has been embodied in the manner of construction which is now preferred by me.

Figure 1 is an elevation of the machine taken from one side.

Fig. 2 is an elevation of the machine taken from another side, the same being that occupied by the operator.

Fig. 3 is a top plan view of the machine.

Fig. 4 is a sectional plan view taken through the bottom of the drying chamber and just below the main body of the rotating head, or approximately upon the plane indicated by the line 4—4 of Fig. 2.

Fig. 5 is a vertical section taken on the plane extending from front to rear through the rotating head and its immediately associated parts.

Fig. 6 is a cross section through the drying chamber upon substantially line 6—6 of Fig. 2.

Fig. 7 is a horizontal section taken through the rotating head, this being taken immediately above the gear teeth thereof.

Fig. 8 is a section taken on a vertical plane showing the transfer head or turret employed for transferring the caps from the rotative head to the drying chamber.

Fig. 9 is a detail showing a can top and the means for holding and turning it and for applying the compound.

This machine is intended for operating upon caps of the kind which are employed in manufacturing what is known to the trade as sanitary cans. These cans are of a type which have the caps or heads applied thereto by a flanged seam. These caps, before being applied to the can bodies, are provided with an upstanding peripheral flange and it is customary to apply to the inner surface of this flange, or in the corner formed by the junction of this flange with the body of the cap, a thin coating of sealing material. This sealing material is usually a substance, as for instance, a rubber compound, which is soluble in a volatile liquid. In consequence, if the compound be retained in its place for only a very brief period and, particularly, if it be subjected to drying or evaporating influences, the solvent fluid will be evaporated.

In my present machine I provide a means for holding a stack of the caps to be treated in position such that an automatic feeding device may take these, one at a time, and deliver them to the parts of the apparatus which apply the compound, and then dry it. A convenient type of means for holding the stack of caps to be treated consists of four vertical rods 1, these being placed to engage the edges of the stack of caps 10. Mounted to reciprocate in guides 12 carried by the frame, is a feeding plate 11, which is so constructed as to engage the lowermost of the pile of caps and remove the same. This reciprocating plate 11 is actuated by means of a link 13 connecting it with a crank arm 14 carried by a vertical shaft 15, which is actuated through the bevel gears 16. The particular means employed for holding and feeding the caps is immaterial.

The cap 10, as removed from the storage stack, is dropped in position where it would be engaged by the fingers or arms 20 of a rotating transfer disk or turret 2. This disk is rotating immediately over the top of the table 3 of the frame. Concentric with the axis of this disk is a curved guide shoulder or wall 30, which projects enough above the table to form a restraining wall which engages the outer edges of the caps 10 as they are being transferred by the transfer disk or header 2, to retain the same in place

and insure their being fed into position to be secured and operated upon by the rotative head employed in applying the compound.

The main rotative head is mounted above the table to turn upon a vertical axis. This consists of a main body 4, which is used as a reservoir, or tank, for holding the compound which is to be applied to the caps. Disposed about the periphery of this head at regular intervals, are a series of cap holding and rotating means. Each of these cap holding and rotating means employs a vertical shaft 25 which is mounted to turn in a suitable journal which is formed in or mounted upon the body of the head 4.

Mounted upon the lower end of this shaft is a foot 26 of a size somewhat less than the diameter of the cap and adapted to engage with the upper surface of the cap and to hold the same between it and a complemental lower rotative member 5. The shaft 25 is provided at its upper end with a pinion 27 which meshes with a gear wheel 28, which is fixedly supported from the frame through the arm 31 so that, as the head rotates upon its axis the shaft 25 will be rotated as well as being carried through a circular path by the rotation of the head.

The complemental clamping means consists of an under foot 5 which is mounted to turn upon a block 50, which in turn is mounted for vertical reciprocation in a disk or web 51, which is secured to the shaft 40 to thereby rotate in harmony with the upper head 4. The two feet 26 and 5 are in alinement.

Each of the blocks 50 is provided with a cam roller 52 which is adapted to engage a cam flange 33, whereby the rotation of the head 4 will cause these blocks to be raised and maintained in raised position throughout a certain portion of the circular path through which they travel. In consequence, if a cap be placed between the two parts 5 and 26, and these be brought together by the raising of the lower, the cap will be held securely between them and by reason of the fact that the upper member 26 is rotated, the cap and the lower member 5 will also be rotated. To permit this the lower member 5 is mounted upon ball bearings 53 which permit its free rotation.

The lower foot 5 turns upon a central stem 55 which has a collar 57 which has a sliding fit in a bore of the vertically reciprocating block 50 and is yieldingly supported by a spring 54, contained in said bore. The upward movement of the stem 55 and likewise of the lower foot 5, is limited by the lock nuts 56 on the lower end of the stem. These lock nuts are adjusted so that the lower foot 26 would be given a slight excess rise by the action of the cam 33. This is absorbed in the spring and insures a uniform gripping pressure upon the tops.

These parts are so timed that when the cap 10 is placed in proper position by the rotating transfer disk or turret 2, the cap will be clamped between the upper and lower members 26 and 5 to be held therebetween and to be carried with them during the rotation of the head 4. It will be thus held and rotated until it reaches the point where it is to be released and transferred to the drying mechanism, at which point the blocks 50 will be dropped, thus freeing the cap.

Mounted upon the outer surface of the rotating head 4 are a series of small pumps which are employed for discharging the sealing compound upon the inner surface of the flange of the cap. Each one of the cap-holding mechanisms has its corresponding pump. This pump employs a section 6 which is bored to constitute a cylinder and a plunger 60, which plunger is connected with a slide 61 which is mounted to slide in guides 62 formed in, or secured to, the outer surface of the head 4. As herein shown, the guides 62 are formed as part of a separate plate which is secured to the outside of the head.

Each slide 61 has a cam follower or wheel, 63, secured thereto and traveling in the groove of a cam 32, which is in the form of a ring fixedly supported from an arm 31 which rises from the frame of the machine. This cam ring is so shaped that it will cause one reciprocation of each plunger during each revolution of the head. The timing of this is such that the discharge of the compound from the pump will begin immediately after the cap has been clamped in position and its rotation started. The discharge of the compound into the caps is through short tubes 64, which are so placed as to discharge into the angle between the flange and the body of the cap. As the cap is at this time rotated, the compound will be distributed about the periphery of the cap and the centrifugal effect caused by the rotation will cause it to adhere to the inner face of the flange.

At the point where the caps are freed from the rotative members of the head, they are engaged by one of the fingers 70 of the rotative transfer disk 7. This transfer disk is, in its general shape and manner of operation, similar to the transfer disk 2, which is employed for placing the caps in the rotative head. Associated with this is a slightly elevated guide wall 30, which is concentric thereto and which engages the outer edges of the cap while being transferred. The end of this wall 30, which is nearest to the center of the rotative head 4, is in position to engage the edge of the cap which is toward the center of the head 4 and

thus to guide it out and away from the center of this head. As the cap reaches the side of the transfer head, which at the time is away from the rotative head 4, it catches another guide 72, which guide is composed of a series of detached portions. These are of such size and so disposed, as to be complemental to similar projections which are formed on the under sides of the fingers 70 of the transfer disk 7. The edges of the caps are engaged only by the projections 73 which lie between the recesses 71 at the lower side of the transfer disks 7. In consequence, the projections 72 and 73 do not contact, and the cap, as it reaches this point, is deflected outward by the projection 72.

The action of these guide surfaces and the transfer disk 7, is such that the caps are delivered into the drying mechanism. The drying mechanism consists, in effect, of a chamber which is provided with means for delivering heated air thereto and for circulating the same upward through the chamber. It is also provided with means for holding the caps in a vertical stack in which the caps are held horizontally and independently each of the others, that is, the caps are not stacked upon themselves, but are independently held by a separate mechanism.

The means provided for holding these caps and for feeding them through the drying chamber consists of two threaded rods 8, which are placed parallel with each other at such a distance that the edges of the caps 10 may enter between the threads of the rods and be supported thereby. To prevent removal of the caps from between the two threaded rods, stationary guide rods 80 are provided, these lying in a position approximately 90° at each side from the rods 8.

One of these guide rods 80, being the one which is toward the side from which the caps are supplied, is cut a little short, thus leaving a space beneath it through which the caps may pass to the holding and elevating rods 8. At their lower ends, each of the rods 8 is provided with a pinion 81, and both of these pinions are in mesh with a gear 82 which is rotated through the bevel gears 83, one of which is carried by the main driving shaft 84.

As the caps are raised by the threaded rods 8, they eventually reach the top of the drying chamber 85 and emerge through an opening in its upper end. Surrounding this opening and extending upward a suitable distance, are four bars 86, so positioned as to closely surround the stack of caps 80 and retain them in position until they have been removed by hand.

Connected with the lower end of the drying chamber 85 by suitable pipe, is an air heating mechanism which employs a combustion chamber 87, which is heated by a gas jet 88, or in any other suitable and desired manner. The air thus heated passes upward through the drying chamber, where it heats the caps and volatilizes the solvent which has been employed in connection with the sealing compound. The air then discharges through a pipe 89. This pipe may be connected up with a waste pipe, when this is desired, which will thus carry the fumes of this liquid to any point desired. It may thus be discharged outdoors where it can by no possibility do any harm.

For convenience in inspecting the interior of the drying chamber and for giving access to the caps therein, I have provided one side of this chamber with a door 80, which may conveniently extend throughout the length of the chamber and consists of substantially one-half the surface thereof. By means of this door the interior of this chamber may be readily gotten at.

For convenience, the main or driving pulley is mounted loosely upon the main shaft 84 and is connected thereto by friction clutch mechanism 90, which is controlled in its action by a lever 91, so placed as to be convenient to the operator, whereby he can start and stop the machine at any time.

As a means for adjusting the amount of the compound delivered, I provide means for adjusting the length of the stroke given the plungers 60. This may be done by passing the upper ends of the plungers 60 through ears 41 carried by the reciprocating plate 61, and providing the plungers with a fixed collar 65, which engages one side of the ears 41 and engaging the other side of the ears 41 by lock nuts 60, which may be adjusted in position. In this manner the connection between the plungers 60 and the reciprocating plates 61, by which they are actuated, may be given whatever amount of slack may be desired and thereby control the amount of compound delivered within certain extremes.

The guide bars 80 in the drying chamber are mounted on lateral stems 100 which are slidable in guides 101 and are secured in adjusted position, as by set screws 102, so that the bars 80 may be adjusted toward and from the axis of the drying chamber.

What I claim as my invention is:

1. In a device of the kind described, a drying mechanism for the can tops comprising two parallel rods threaded and spaced apart to receive opposite edges of the can tops between their threads, and retaining bars engaging the edges of the can tops between said threaded rods.

2. In a machine for drying can caps, a vertical drying chamber, means for producing an upward draft therethrough, means for feeding the can caps to the bottom of the drying chamber, two rotative threaded

bars engaging the opposite edges of the can caps to support them and to slowly move said caps upward through the drying chamber, and guide bars engaging the edges of the can caps between said threaded rods.

3. In a machine of the kind described, a drying chamber, means for producing a circulation therethrough, and means for passing the can caps through said chamber and maintaining each cap out of contact with the other caps during the drying period and a stack retaining means outside said drying chamber.

4. In a machine of the kind described, a vertical drying chamber, means for passing air upward through said chamber, means for feeding can caps singly to the bottom of said chamber, two parallel vertical rods in said chamber threaded to receive the edges of the caps between their threads, means for turning said rods to lift the caps, and means for feeding a cap singly between said rods at each revolution thereof.

5. In a machine of the kind described, a vertical drying chamber, means for passing air upward through said chamber, means for feeding can caps singly to the bottom of said chamber, two parallel vertical rods in said chamber threaded to receive the edges of the caps between their threads, means for turning said rods to lift the caps, guide bars engaging the edges of the caps between the threaded rods, and means for feeding a cap singly between said rods at each revolution thereof.

6. In a cap drying device, two threaded vertical rods spaced to receive the edges of the caps in their threads to thereby support the caps, means for turning said threaded rods to feed the caps, guide rods spaced between said threaded rods and engaging the edges of the caps and fixed cap-retaining rods receiving the caps as discharged from the threaded rods.

7. In a can cap drying device, a pair of parallel threaded rods adapted to receive the edges of a can top in their threads, an inclosing chamber having a removable side, and a retaining bar carried by said removable side and adapted to engage the edges of the can caps between said threaded rods.

8. In a can cap drying device, a pair of parallel threaded bars adapted to engage opposite sides of the can caps with the edges of the caps in the threads, means for turning said threaded bars, an inclosing casing forming a drying chamber, one side of said chamber being removable, and a guide bar carried by said removable section of the casing and engaging the edges of the can tops which are held by said threaded rods.

9. In a can cap drying device, a pair of threaded parallel rods spaced apart to receive opposite edges of the can caps in their threads, a fixed guide bar engaging the edges of the caps between said threaded rods, a laterally movable guide rod engaging the edges of the can caps at the side opposite the fixed guide rod, and a casing surrounding said rods and forming a drying chamber.

10. In a can cap drying device, a vertically positioned drying chamber having a hinged side and means for conducting drying air therethrough, two parallel threaded rods rotatively mounted and extending lengthwise through said chamber, said rods being spaced apart to receive the edges of the caps to one end of said rods, a fixed guide rod engaging one side of the caps between said threaded rods, and a guide rod engaging the opposite side of the can caps and supported from the hinged side of the drying chamber.

Signed at Seattle, Washington, this 12th day of June, 1917.

NELSON TROYER.