July 24, 1928.

1,677,928

W. L. PHILLIPS

MACHINE FOR TOPPING CANS

Filed April 8, 1927

4 Sheets-Sheet 1

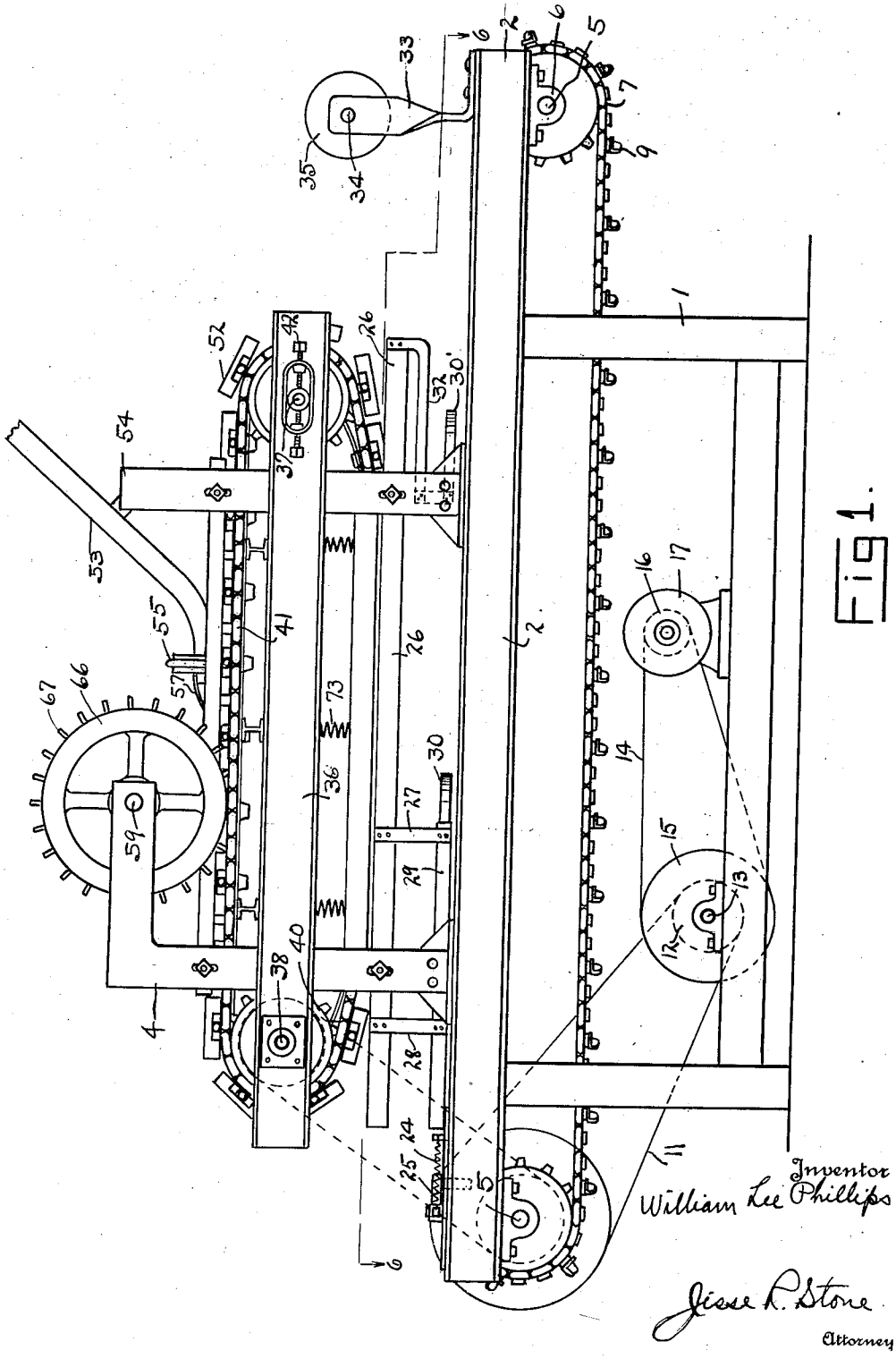


Fig 1.

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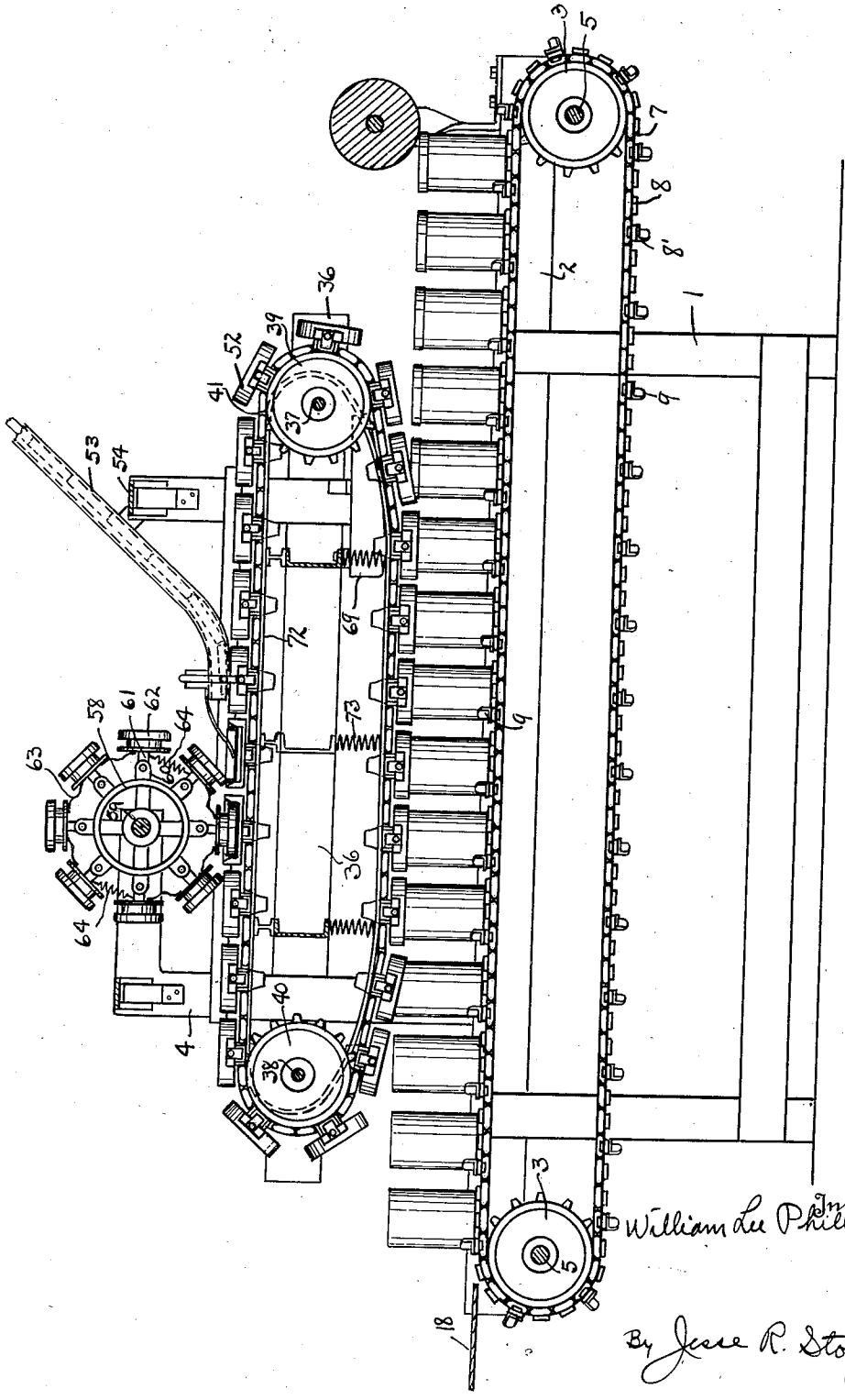


Fig. 2.

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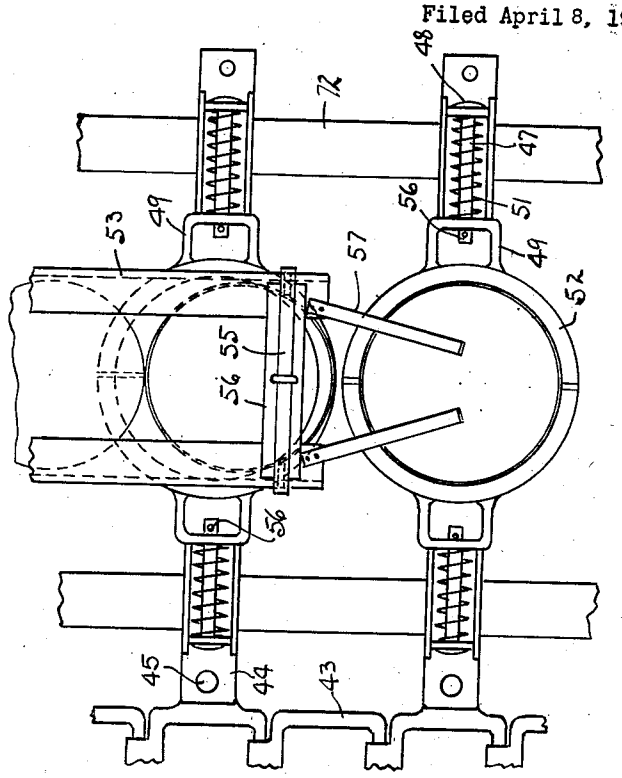


Fig. 4.

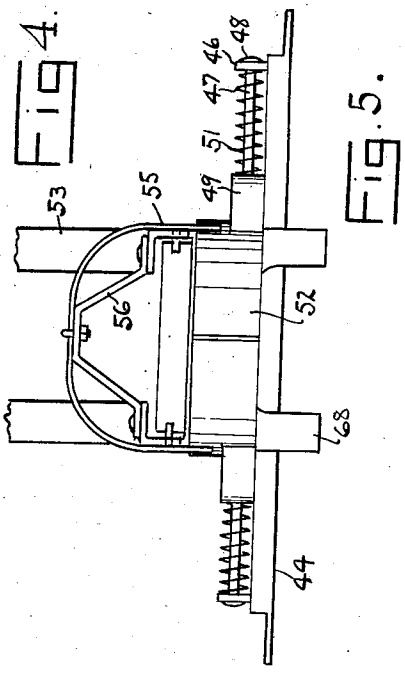


Fig. 5.

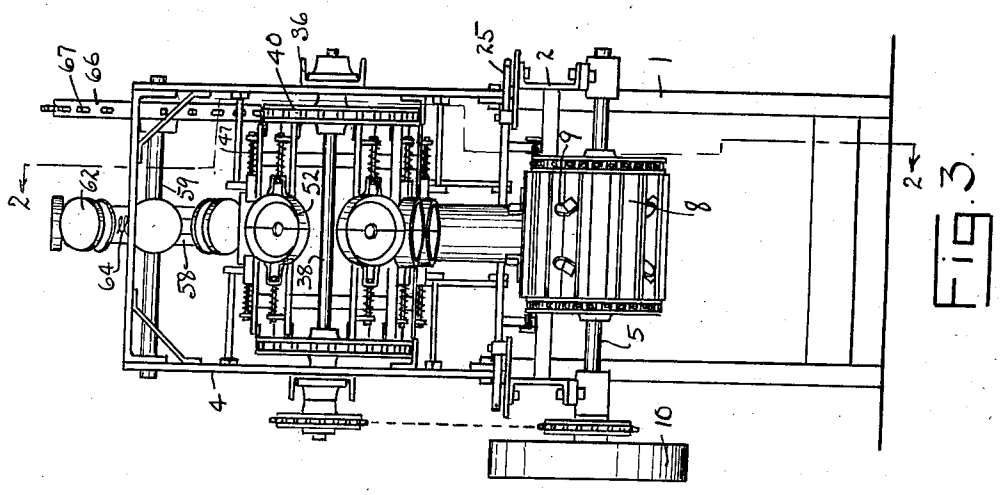


Fig. 3.

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MACHINE FOR TOPPING CANS

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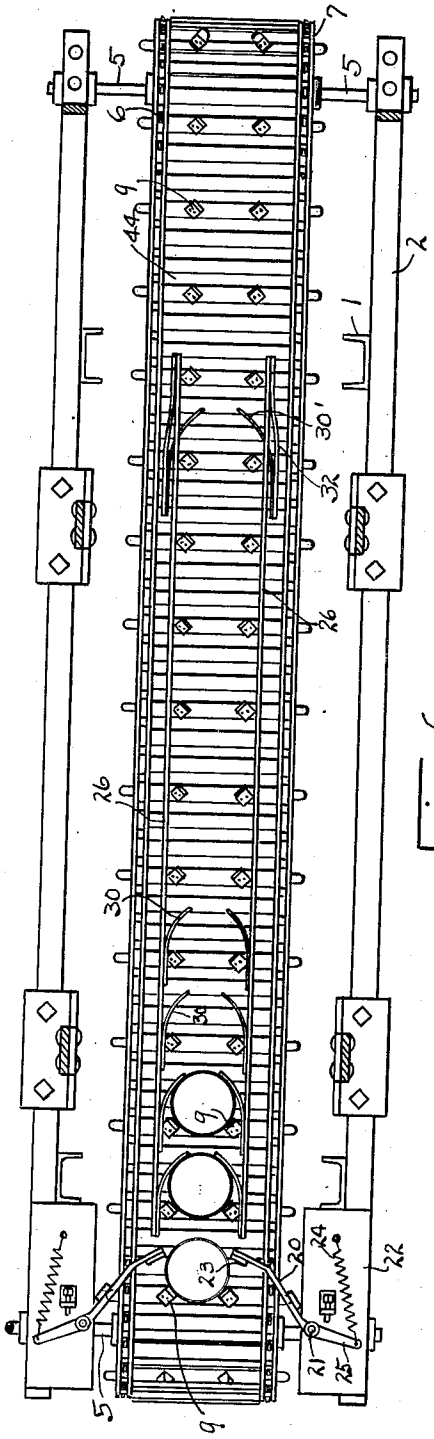


Fig. 6.

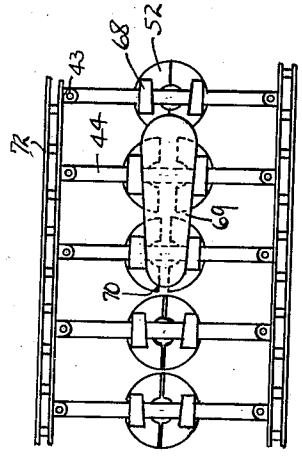


Fig. 7.

William Lee Phillips Inventor

By Jesse R. Stone

Attorney

Patented July 24, 1928. 1,677,928

UNITED STATES PATENT OFFICE.

WILLIAM LEE PHILLIPS, OF HOUSTON, TEXAS.

MACHINE FOR TOPPING CANS.

Application filed April 8, 1927. Serial No. 182,167.

My invention relates to an apparatus for placing tops on cans, or similar containers, such as are used for marketing coffee, tea or similar articles of consumption.

It is an object of my invention to provide an apparatus by means of which the tops or covers may be placed upon cans containing food products so as to secure them accurately in position and force them firmly into contact with the can.

It is desired that the apparatus be adapted to receive the can upon which the tops are to be placed and to secure the tops in position thereon in such manner that they will fit accurately and will not bend or mutilate the can or the cover, and thus provide a minimum amount of waste.

It is also an object that the device be capable of rapid operation so that the tops may be placed on the cans at a fairly high speed and thus be capable of great saving of labor.

The invention consists particularly in the construction and arrangement of the parts making up my device, whereby the covers of the cans are received and placed firmly on the cans and then released. A better understanding of this construction will be obtained by reference to the drawings herewith.

Fig. 1 is a side elevation of a machine carrying out my invention. Fig. 2 is a side elevation, partly in section, on the line 2—2 of Fig. 3. Fig. 3 is an end elevation of the device. Fig. 4 is an enlarged detail in broken plan view of the cover delivering and receiving device. Fig. 5 is a broken front elevation of the structure shown in Fig. 4. Fig. 6 is a top plan view, partly in section, on the line 6—6 of Fig. 1; and Fig. 7 is a broken detail of the carrier belt illustrating my releasing mechanism. Like numerals of reference are employed to designate like parts in all the views.

My invention is mounted upon a frame work having two sets of supporting uprights 1 connected at their upper ends to side frame members 2, which extend the full length of the machine at each side thereof, as shown particularly in Fig. 6, and serve to support the operating device. Above the two side pieces 2 an upper frame 4 is mounted, said frame being of such shape as to adapt it to support the operating mechanism and will not need to be particularly described.

The lower portion of the frame serves as a mounting for the can carrying mechanism. There are shafts 5 at each end of said frame, said shafts being journaled in bearing members 6 secured to the lower side of the two side frame members 2. These shafts have mounted thereon at points spaced inwardly from the side members 2 a pair of spaced sprocket wheels 3 to receive a conveyer made up of two side sprocket chains 7 engaging the said sprocket wheels, said chains having secured thereon a series of supporting plates or bars 8 which connect the chains together and form a conveyer belt upon which the cans may be placed. Certain of said plates 8′ are extended slightly beyond the belt at each end and have toward the central point of said plates a pair of spaced lugs or brackets 9. These lugs are angular in shape, the base being secured to the plate and the body extending upright from the plate a short distance, the lugs being spaced apart to receive between them a can of the size upon which the machine is to operate. The plates 8′ are shown in the machine illustrated as being spaced apart along the belt so as to include between them two ordinary plates 8. This allows sufficient space between adjacent sets of lugs to include a can, as will be seen from Fig. 2.

The belt is moved to convey the can in the proper direction by means of a pulley 10 upon one of said shafts 5. The pulley 10 is connected up for operation by means of a belt 11 with a pulley 12 upon a shaft 13, the said shaft being rotated through means of a belt 14 connecting the pulley 15 upon said shaft with a pulley 16 upon an adjacent motor 17. It is to be understood, of course, that power may be communicated to the drive pulley 10 by any preferable means, and I do not wish to be limited to the power connections shown.

The cans are delivered to the conveyer belt 7 from a chute, indicated at 18 in Fig. 2. They are engaged by the lugs 9 upon the belt and moved forwardly as the belt advances. It is desirable to have the cans spaced uniformly apart resting accurately against the two lugs on the belt. The placing of the can in accurate position against the lugs is assisted by guides and placing members spaced above the belt. Adjacent the forward end of the machine I place two opposite levers 20 which are pivoted at 21 upon a plate 22 on the side frame member 2. The arms are curved, as shown in Fig.

6, the inner end projecting into the path of the can as it is moved by the belt. The inner end adjacent the can has thereon a head 23 to contact with the can. The head 23 is held resiliently toward the can by means of a spring 24 secured to the outer arm 25 of the levers 20. Said spring tends to hold the heads in such position that they will contact with the can and carry it against the lugs 9 and fit it in position. The can will be moved between the two heads 23 of the levers as the can is advanced.

Beyond the two levers 20 I place two spaced guide bars 26. These bars, as will be seen from Fig. 1, extend from a point somewhat ahead of the levers 20 forward along the frame to a point somewhat short of the rear end of the frame. They are spaced apart to receive and guide the cans somewhat loosely. Upon these side bars are two downwardly extending arms 27 and 28 which are adapted to support plates 29 upon which are secured a plurality of spring members 30. As will be seen from Fig. 6, these springs arms are curved inwardly from the side plates 29 and will contact with the cans as they are moved along by the conveyer and will tend to hold the cans firmly against the lugs 9. I may use as a plurality of these sets of spring arms 30 and I have shown four, the forward set of which extends beyond the forward ends of the side plate 29. These arms will act successively upon the can so as to assure that it be properly positioned on the conveyer so that it may accurately register with the tops to be placed thereon. At the forward end of the supporting bars 26 I have shown a separate pair of spring arms 30′ which are secured at the lower end of the arms 32 extending downwardly from the support bars 26, as shown in Fig. 1. These arms bear against the can at the time the cover placing device is removed and prevent the moving of the can at the time the cover is finally placed in position.

Beyond the cover placing guides I place a pair of upright legs 33, one at each side of the frame, and upon these legs is journaled a shaft 34 with a weighted roller 35 thereon to engage with the can covers, as will be later described.

Spaced above the cam conveyer a predetermined distance therefrom is a shorter frame 4, previously referred to. Upon this frame are two longitudinal side members 36, on the ends of which are mounted shafts 37 and 38 respectively. These shafts furnish a support for sprocket wheels 39 and 40. These sprocket wheels are in pairs upon each shaft and support a conveyer belt 41 similar in general construction to the conveyer belt 7 for the cans. There are two sprocket chains at each side of the conveyer belt running over the sprocket wheels 39 and 40, and upon this belt are can top receiving members which will be presently described. The shaft 37 is mounted in bearings at each end which are adjustable by means of screws 42 so as to place the proper tension upon the conveyer belt when it tends to become slack.

The conveyer belt 41 is made up of two spaced sprocket chains 43 adapted to run upon the sprocket wheels 39 and 40. To alternate the links in the sprocket chains are connecting arms 44, which extend transversely across to connect with the opposite link in the belt and furnish a support for the can receiving cups. The arms 44 are connected to the links by bolts or rivets 45. At spaced points adjacent each end of the arms 44 are upwardly extending lugs 46, said lugs having openings therethrough to receive pins 47. Said pins have heads 48 thereon to contact with the lugs and limit the movement of the pin inwardly. The inner end of the pin is extended through a yoke 49 and secured therein by means of a cotter pin 50 or similar means. A tension spring 51 upon the pin 47 extends to force the yoke 49 inwardly away from the lugs 46.

The yokes 49 are formed upon a top receiving cup 52. Said cup is divided longitudinally into two parts which are held resiliently toward each other by means of the spring 51, and when in assembled position, the cup is of cylindrical shape and shallow in depth and is adapted to receive the tops of can covers which are to be fixed upon the cans. These arms 44 are spaced apart upon the belt a sufficient distance to register with the cans to which the tops are to be applied.

The tops are adapted to be delivered to the cups by means of a chute 53. Said chute has a shallow trough of the proper width to receive a can top and is inclined to carry the tops in succession downwardly toward the cups by means of gravity. The chute is supported adjacent the lower end by an upwardly extending arm 54 upon the frame. The delivery end of the chute is connected with a yoke 55 and is supported thereon in position spaced upwardly so as to allow the cups to pass beneath it. The yoke 55 is of inverted U-shape and has a brace or bracket 56 thereon which is connected with the upper end of the side channel irons of the chute 53. Two forwardly extending spring arms 57 are secured upon the forward end of the chute. These arms extend forwardly and downwardly and are also inclined toward each other and are adapted to bear upon the upper face of the can top and force it into the cup.

Mounted on the frame 4 above the upper conveyer belt is a rotatable frame 58 mounted upon a shaft 59 in the frame and adapted to rotate therein. The frame is made up of a cylindrical frame work having a series of radially projecting arms 60 there-

on to which are pivotally secured the rods 61 upon piston heads 62. The rods 61 are pivotally connected with the arms 60 and have a lateral movement in a vertical plane. The pistons are of proper size and shape to fit within the can tops which are carried by the conveyer belt below. The pistons are held radially outward by springs 63 secured on the lower side of adjacent pistons and adapted to bear resiliently against the lower side of the next adjacent piston. On two opposite points the heads 61 are connected by spiral springs 64. In this manner the pistons are held in radial position but are adapted to give resiliently in either direction when the plunger contacts with the cup beneath. The frame work with the plungers is mounted in proper spaced relation above the upper conveyer belts so that the plungers will extend to a point closely adjacent the bottom of the conveyer cups.

The frame work with the plungers thereon is adapted to rotate with the belt and at the same rate through a wheel 66 mounted upon one end of the shaft 59. Said wheel is formed with radially extending pins 67 thereon which are spaced apart to fit within the openings in the links of the sprocket chain 43. Thus, when the chain is moved through its actuating means it will serve to rotate and move at the same rate with it the wheels 66 and thus hold the frame work and the plungers in proper registration with the conveyer belt at all times.

On the lower side of the upper frame work 4 and adjacent the sprocket wheels 39 is a releasing device which acts to spread the two parts of the cup. As will be noted from Fig. 5, the two halves of the cup 52 each have downwardly extending arms 68 thereon to engage with the releasing device so as to deliver the can tops. This releasing device comprises a shoe 69. The shape of this shoe is shown best in Fig. 7. It has its ends rounded and its opposite sides converge toward the end 70 so as to engage between the two arms 68 upon the cups.

To properly guide and position the upper conveyer belt for the can tops, I provide a resilient loop or track upon which the belt may travel. This track comprises a flat spring member 72 secured to the frame member below the upper sprocket chains and serving as a guide and support for the chain. This spring member is carried around the shafts of the sprocket wheels 39 and 40 and is extended down so as to act as a guide for the chain on its travel above the cans. It is supported in its lower position by springs 73 extending from the frame downwardly against the track member and thus tends to force the cups with the caps therein firmly against the upper edges of the cans.

In the operation of the device, the motor will tend to rotate both conveyer belts uniformly at the same rate so that the cups on the upper conveyer belt will move at the same rate and in proper registration with the cans upon the lower conveyer belt.

The can tops will be delivered by gravity along the chute 53 and as each of the cups 52 comes beneath the end of the chute it will receive one of the tops which will be delivered into the cup with the open side of the top extending upwardly. As the top is carried along by the cup, it will be forced tightly into the said cup by the plungers 62. As these plungers enter the cups they will be allowed a certain lateral movement to accommodate the plungers to the cups so that they will force the tops firmly into position. The tops will then be carried along around the conveyer and delivered upon the upper ends of the cans.

The cans will be delivered by any desired means from the chute 18 upon the conveyer belt. As the can is caught by the lugs 9 upon the belt it will be moved forwardly and will be engaged by the heads 28 upon the arms 20 and will be forced against the lugs so as to register the can accurately. This action will be repeated as the cans are carried along the guide 26 and between the spring arms 30 so that when the can comes beneath the cup upon the upper conveyer belt it will be in accurate registration with the cup and will receive the top in proper position thereon. As the can is carried along beneath the conveyer belt, the tops will be adjusted firmly in position. As the lower conveyer belt reaches the releasing shoe 69 the shoe will engage between the two arms 68 upon the cup and force the two halves of the cup resiliently away from each other against the action of the springs 51, thus entirely releasing the tops of the cans so that the tops will remain firmly seated upon the cans. As the can is advanced by the lower conveyer it will pass beneath the weighted roller 35 which will act to assure the even and positive seating of the top upon the can. The can with the contents therein may then be delivered in any chute or container which may be desired.

The action of this conveyer is positive and accurate and as the cans and tops are both registered accurately in position, the tops will be delivered upon the cans and released with no danger of damaging or mutilating the top or failing to deliver the top in tightly closed position upon the can.

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

1. In a device of the character described, an endless conveyer for can tops, a chute to deliver tops to said conveyer, top receiving cups spaced uniformly apart on said conveyer, a rotatable frame above said conveyer, adjustable plungers on said frame positioned

to fit within said cups and force said tops tightly therein, a can conveyer spaced a predetermined distance below said top conveyer, means to space and retain the cans on said can conveyer to register with said cups, and means to release said tops from said cups.

2. In a device of the character described, a flexible conveyer for can tops, a chute to deliver tops to said conveyer, top receiving cups spaced uniformly apart on said conveyer, a rotatable frame above said conveyer, adjustable plungers on said frame positioned to fit within said cups and force said tops tightly therein, a can conveyer spaced a predetermined distance below said top conveyer, means to space the cans on said can conveyer to register with said cups, separate means on said can conveyer to retain said cans in position, means to release said tops from said cups, and means to thereafter force said tops tightly on said cans.

3. In a device of the character described, a frame, a lower can-conveyer belt rotatable on said frame, an upper top-conveyor belt spaced above said can-conveyer belt, top-receiving cups uniformly spaced on said top-conveyor belt, means to space the cans on said conveyor belt to register below said cups, means on said can conveyor to retain said cans in position, means to deliver tops to said cups, means to force said top firmly in said cups, and means on said frame to release said top from said cups.

4. In a device of the character described, a frame, a lower can-conveyor belt rotatable on said frame, an upper top-conveyor belt spaced above said can-conveyor belt, top-receiving cups uniformly spaced on said top-conveyor belt, said cups being adapted to expand laterally, means to space the cans on said can-conveyor belt to register below said cups, means to deliver tops to said cups, separate means to force said tops firmly in said cups, and means on said frame to expand said cups and to release said tops from said cups.

5. In a device of the character described, a frame, a lower can-conveyor belt rotatable on said frame, an upper top-conveyor belt spaced above said can-conveyor belt, top-receiving cups uniformly spaced on said top-conveyor belt, means to space the cans on said can-conveyor belt to register below said cups, means on said belt to retain the cans in position, means to deliver tops to said cups, separate means to force said tops firmly in said cups, comprising a rotatable frame, plungers on said frame positioned to fit within said tops as they are moved by said top-conveyor, and means on said frame, to release said tops from said cups.

6. In a device of the character described a can top-conveyor including spaced sprocket chains, arms connecting said chains, cups on said arms, said cups being formed in two parts each resiliently supported on said arms, means to feed tops to said cups, means to force said tops into said cups, and means to thereafter spread the parts of said cups to release said tops.

7. In a device of the character described a can top-conveyor including spaced sprocket chains, arms connecting said chains, cups on said arms, said cups being divided into two lateral sections, means to hold said sections resiliently together, and means to force said sections apart so as to release said cups, means to feed tops of said cans, means to force said tops into said cups and means to thereafter spread the parts of said cups to release said tops.

8. In a device of the character described a can top-conveyor including spaced sprocket chains, arms connecting said chains, cups on said arms, said cups being formed in two parts each resiliently supported on said arms, means to feed tops to said cups, means to force said tops into said cups including a rotary frame, radially arranged pistons on said frame positioned to register with and fit into said cups, and means to thereafter spread the parts of said cups to release said tops.

9. In a device of the character described a can top-conveyor including spaced sprocket chains, arms connecting said chains, cups on said arms, said cups being divided into two lateral sections, means to hold said sections resiliently together, and means to force said sections apart so as to release said cups, means to feed tops to said cans, means to force said tops into said cups, including a rotating frame, radially arranged pistons on said frame positioned to register with and fit into such cups, and means to thereafter spread the parts of said cups to release said tops.

10. In a device of the character described, upper and lower conveyer belts spaced apart, means to move said belts simultaneously, can receiving supports on said lower conveyer belt, top receiving cups on said upper conveyer, means to deliver tops to said cups, means to force said tops tightly into said cups, means to release said tops from said cups, and a weighted roller to roll on said tops when said tops are secured on said cans in the manner described.

11. In a device of the character described a top conveyer belt, cups secured in spaced relation thereon, said cups having two parts held resiliently in position on said belt, means to deliver tops into said cups, means to fit said tops frictionally into said cups, arms on each of the parts of said cups, and a shoe adapted to be engaged by said arms and to force said parts resiliently apart to release said tops.

12. In a device of the character described

a top conveyer belt, arms on said belt, longitudinally divided cups on said arms, springs on said arms holding the parts of said cups resiliently together, means to deliver tops into said cups, means to fit said tops frictionally into said cups, arms on each of the parts of said cups, and a shoe adapted to be engaged by said arms and to force said parts resiliently apart to release said tops.

13. In a device of the character described a top conveyer belt, cups secured in spaced relation thereon, said cups having two parts held resiliently in position on said belt, means to deliver tops into said cups, a frame work rotatable by said belt, radial plungers thereon positioned to fit within said cups and force said tops tightly therein, and means to release said tops from said cups.

14. In a device of the character described a top conveyer belt, cups secured in spaced relation thereon, said cups having two parts held resiliently in position on said belt, means to deliver tops into said cups, a rotatable frame work spaced above said belt, plungers extending radially from said frame work, said plungers being laterally movable and adapted to fit within said cups, and means to release said tops from said cups.

In testimony whereof I hereunto affix my signature this 1st day of April A. D. 1927.

WILLIAM LEE PHILLIPS.