G. E. FRAZIER.

FRUIT JAR CAPPING MACHINE.

APPLICATION FILED DEC. 3, 1920.

1,426,056.

Patented Aug. 15, 1922.

3 SHEETS—SHEET 1.

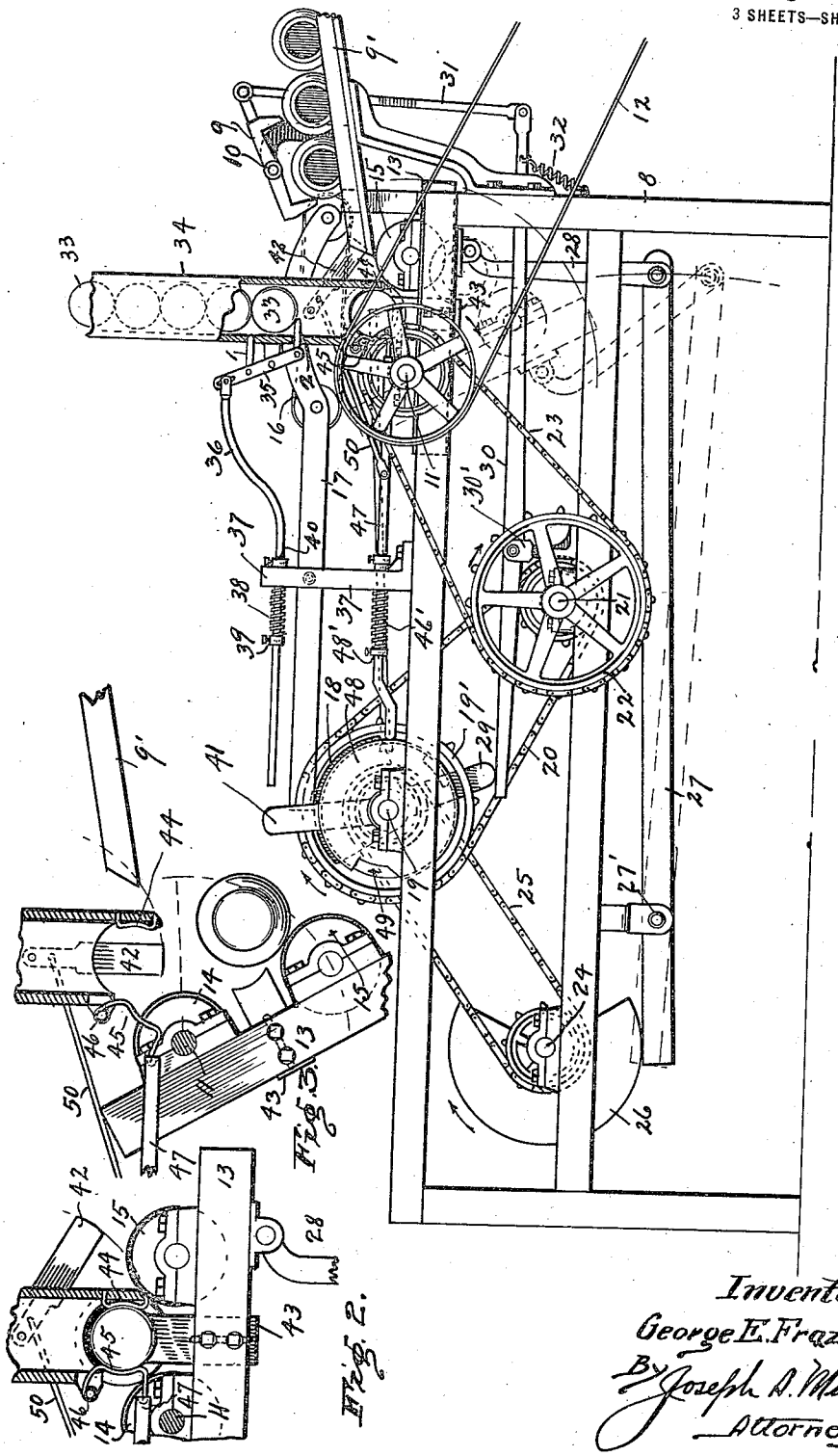


Fig. 1.



Fig. 3.



Fig. 2.

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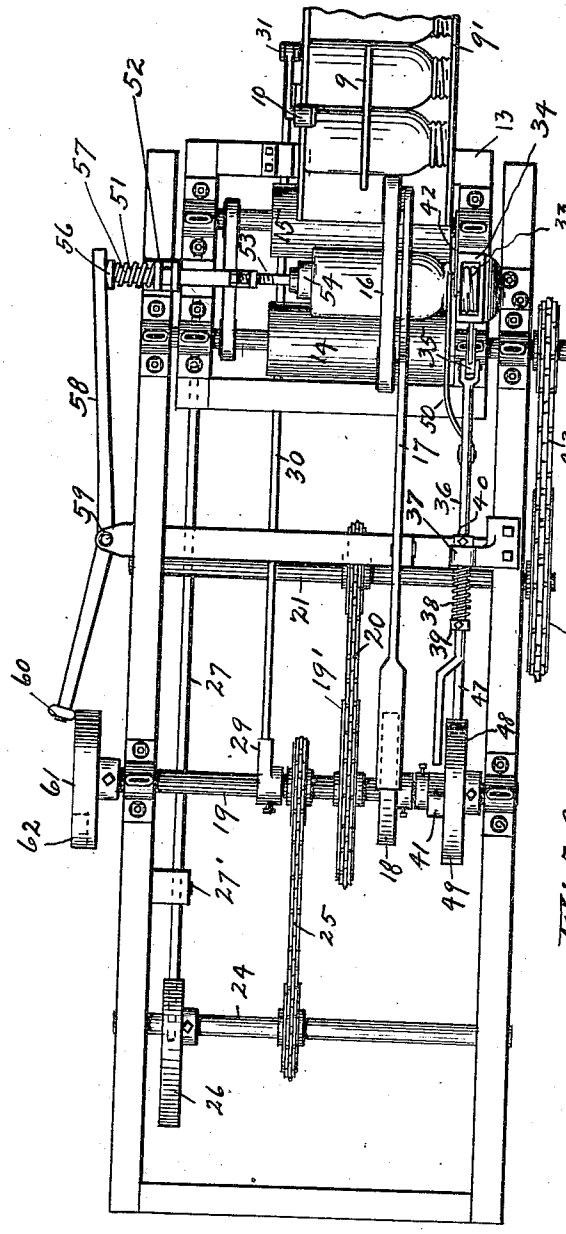


Fig. 5.

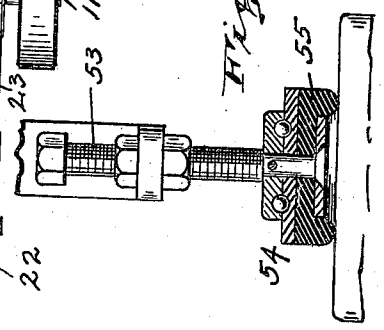


Fig. 4.

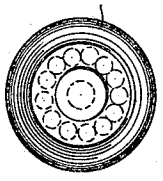


Fig. 6.

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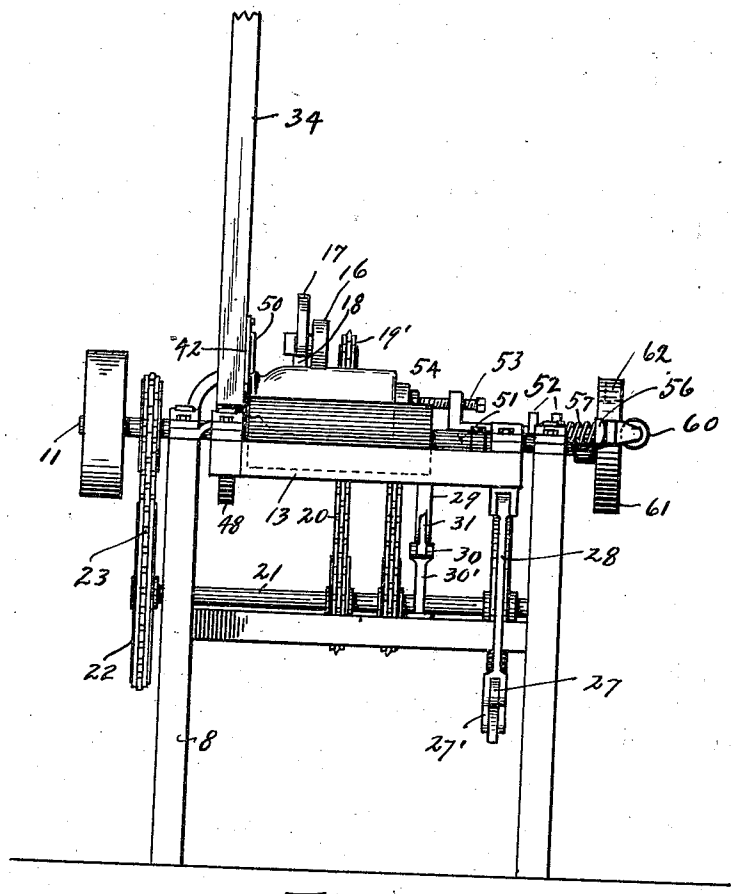



Fig. 7.

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# UNITED STATES PATENT OFFICE.

GEORGE E. FRAZIER, OF MUNCIE, INDIANA, ASSIGNOR OF ONE-HALF TO CLYDE C. COOK, OF MUNCIE, INDIANA.

## FRUIT-JAR-CAPPING MACHINE.

1,426,056. Specification of Letters Patent. Patented Aug. 15, 1922.

Application filed December 3, 1920. Serial No. 427,972.

*To all whom it may concern:*

Be it known that I, GEORGE E. FRAZIER, a citizen of the United States, residing at Muncie, in the county of Delaware and State of Indiana, have invented new and useful Improvements in Fruit-Jar-Capping Machines, of which the following is a specification.

In the manufacture of what is commercially known at Mason fruit jars, which are of glass with screw-threaded mouths on which metal caps are screwed before they are boxed and sent to the market, the screwing-on of the caps has been done by hand with much labor and expense. The object of this invention is to place the caps and screw them on the jars by mechanical means, automatically.

I accomplish the object of the invention by the mechanism illustrated in the accompanying drawings, in which—

Fig. 1, is a view in side elevation of my invention in operative position, part of the machine being in vertical section. Fig. 2 is a detail in partial vertical section of the cap-holding mechanism. Fig. 3 shows the same parts in position for discharging the capped jar. Fig. 4 is a top plan view of the machine shown in Fig. 1. Fig. 5 is a detail in partial section of the rotating head and its adjustment to cans of different lengths, for rotating the cans in screwing them into the caps. Fig. 6 is a side view of the head, and Fig. 7 is an end view of the machine with the carrier for supplying cans to be capped removed.

Like characters of reference indicate like parts in the several views of the drawings.

The frame 8 of the machine is of any suitable material and construction, and to the end which will hereinafter be designated as the front end, are brackets suppporting an oblique slideway 9′, upon which fruit jars to be capped are placed. They are fed off one at a time by gravity and by mechanical means to insure their discharge one at a time. This comprises a reciprocating arm 9, pivoted at its middle to a standard 10, and having a depending finger at each end which alternately hold the entire series of cans while releasing one at a time with the rocking of the arm. The mechanism for rocking the arm will be hereinafter described.

Mounted in suitable journals on the frame 8 is the main shaft 11 which is driven by a belt 12 from any suitable source of power, not shown. Swingingly supported from shaft 11 by suitable journal-boxes, is an auxiliary frame 13, and mounted on shaft 11 between the sides of frame 13, is a roller 14, preferably covered with rubber or other material to increase the surface engagement with a fruit jar. Mounted in journals on the frame 13, is a shaft parallel with shaft 11, on which a roller 15 similar to roller 14, is mounted. Roller 15 is also covered with rubber. The distance between the two rollers is such as to allow a fruit jar to drop between them without going clear through, whereby, the rotation of roller 14 on the driven shaft 11, imparts a rotary movement to the jar. The jar is held against rollers by a belt 16, passing around pulleys supported by a lever-arm 17. The opposite end of arm 17 is weighted to normally raise the belt away from the jar and provide clearance for the placing of a jar on the rollers, and that end is raised by a cam 18 while the jar is being capped. A shaft 19 on which cam 18 is mounted is supported in suitable journals on the frame 8. Mounted on it is a sprocket wheel 19′, which is driven by a link-belt 20, from a smaller sprocket wheel on a shaft 21, mounted in suitable journal boxes, below on the frame 8. The shaft 21 carries a large sprocket wheel 22, which is driven by a link-belt 23, from a smaller sprocket wheel on the main drive-shaft 11. Thus the shaft 19 is driven at a greatly reduced speed from shaft 11.

Mounted in suitable bearing-boxes on frame 8 is a shaft 24, which is driven by a link-belt 25 connecting sprocket wheels of the same size, on it and shaft 19. Mounted on shaft 24 is a cam 26 which is adapted to

contact a lever-arm 27 and move it to raise the long opposite arm during most of the travel of the cam 26. The long arm of lever 27 is connected by a link-bar 28, with the under side of the frame 13, to hold the latter in the positions shown by the full lines of the drawings while a cap is being placed on a jar. The reentrant of the cam releases the lever and allows the weight of the frame 13, to swing the latter about shaft 11 as a fulcrum to the position shown by the dotted lines in Fig. 1, to discharge the capped jar. The lever 27 is pivoted at 27′ to a hanger supported by frame 8.

A standard 30′ supported by frame 8, provides a fulcrum-support for a lever 30. A long arm of this lever is connected by link 31 with the arm 9 controlling the feed of jars to the machine to be capped, and this long arm of the lever is normally lowered by a spring 32, see Fig. 1. Periodical movement of the lever 30 in opposition to spring 32 is occasioned by the contact with the opposite end of the lever of a cam 29 carried by the shaft 19.

Caps 33, are placed by hand or by any suitable means in a vertical chute 34 just large enough to allow them to move down freely by gravity. A rock-bar 35 is pivoted to a bracket from the chute, and the arm is rocked by a bar 36. The latter slides through a suitable way in standard 37. The rock-bar 35 has a slotted end through which a pin passes to secure the sliding bar to said rock-bar, the slot permitting adjustment to prevent binding. The rock-bar has a pin 1 above its fulcrum and a pin 2, below, both of which pass through suitable holes in the side of the chute and are alternately moved into the path of the descending caps to deliver the latter one at a time into the lower end of the chute. The slide-bar 36 is retracted by a spring 38 between standard 37 and an adjustable stop 39, on the rod. Movement is limited by a second stop 40, also adjustable to enable, by adjusting both of said stops, the movement of the slide-bar 36 to be adjusted. The tension of spring 38 is overcome by a cam 41 on the shaft 19.

The jar-caps are thus delivered one at a time to the lower end of the chute which is normally open on the side toward the jar, but is temporarily closed to keep the cap in position until it is clamped, by a swinging closure 42. The cap would fall on through but for a stop 43. This stop is a plate vertically slotted and secured to the frame 13 by two bolts passing through the slot. The length of the slot allows the plate to be raised and lowered, to meet the requirements of caps for jars of different sizes, and the plate will preferably be thick enough to reach and support the neck of the jar to guide the latter into the cap.

While a cap is being placed the closure 42 is down across the opening through which the mouth of the jar will enter the cap, in order to keep the cap from falling out or tilting in that direction. A bent wire-holding-member 44 seated in the adjacent wall of the chute helps to center and hold the cap which is clamped firmly against it by a wire spring-member 45 resiliently secured at one end to a pin 46 supported by the chute and having the other end bent out into contact with a reciprocating bar 47. The latter slides through the standard 37, and is pushed by a cam 48, mounted on shaft 19, against said end of spring-member 45, forcing the spring-member against the cap and clamping the latter between member 45 and the holding member 44, in the manner shown in Figs. 1 and 2. A spring 46′ on the bar 47 between the standard 37 and an adjustable stop 48′ moves the bar away from the spring-member 45 when the detent 49 in the cam reaches the rod. This releases the spring-member and it assumes the position shown in Fig. 3, thereby releasing the capped jar, which rolls off of the rollers 14 and 15 by gravity and out of the way of the next jar and cap when the frame 13 is released by the operation of lever 27 and cam 26. The proper movement of the pivoted closure 42 is secured by connecting it by a link 50 with the bar 47.

I have next to describe the mechanism for pressing the rotating jar into the cap. This comprises a bar 51 having longitudinal adjustment in brackets 52 on frame 8, a bolt-extension 53 screwed through an up-turned end of the bar and adapted to increase or lessen the extent of its projection toward a jar on rollers 14 and 15, a head 54 swivelly mounted on the bolt, preferably on ball-bearings as shown in Figs. 5 and 6, and provided with a rubber portion 55 to contact the end of the fruit-jar. On the outer end of the bar 51 is a head 56, and between the head and bracket 52 is a spring 57, normally moving the bar out to disengage the head 54 from the jar. But this tendency of spring 57 is resisted by a lever 58, pivoted to the frame 8 at 59, and having a roller 60 on the opposite end from that which contacts head 56. The roller contacts the side of a cam-wheel 61, on shaft 19 to overcome the tension of spring 57, until the entrant shown by dotted lines at 62 is reached, which is at the moment that an uncapped jar is placed on the rollers. Spring 57 then withdraws the head 54 from contact with the capped jar and out of the way of the incoming jar. It is not necessary that the same pressure of the head against the jar be maintained at all periods of the capping operation because the threads on cap and jar will draw the jar in when once started.

As it is necessary that the various operations above described be properly synchronized I secure the various cams to their shafts by such means, here shown as set screws, as will admit of their adjustment.

The operation of my invention is as follows. An uncapped jar is fed by gravity, as controlled by fingers on the rocking-arm 9, from the inclined table $9^1$ upon the two rollers 14 and 15. Coincident therewith a jar-cap in chute 34 is allowed by the withdrawal of finger 2, to drop against stop plate 43 into position opposite member 44, and is clamped against the latter by spring-member 45, the closure 42 then down being swung back from the opening opposite the jar as the cap is clamped.

The jar is pressed against the rollers 14 and 15 by belt 16, thereby causing the jar to be rotated, and the rotating jar is pushed into the stationary cap by the cam 61 and lever 58 acting to move head 54 carried by bar 51, against the jar.

The capped jar is then discharged by frame 13 swinging down about shaft 11 as the result of the removal of the frame-support when lever 27 enters the reentrant of cam 26.

While I have here shown the best embodiment of my invention now known to me, it is obvious that many changes in mechanism are possible without departing from the spirit of my invention and I therefore do not desire to be limited to the mechanism shown, but what I claim as new and wish to secure by Letters Patent is—

1. In a machine for capping jars, means for holding a cap in a fixed and stationary position, means for supplying a jar for each cap so held with the threaded mouth of the jar opposite the threaded mouth of the cap, rotating roller means for rotating the jar, means for forcing the jar while rotating into the cap, and means for holding the jar-rotating means at a fixed distance from the cap-holding means.

2. In a machine for capping screw-capped jars, means for holding a cap in a fixed stationary position, means for supplying caps seriatum to said holding means, means for supplying a jar for each cap so held with the threaded mouth of the jar opposite the threaded mouth of the cap, rotating roller means for rotating the jar, means for sliding the jar while rotating into the cap on said rotating means, and means for releasing the capped jar.

3. In a machine for capping screw-capped jars, automatic means for placing and holding the caps, automatic means for placing a jar, automatic means for rotating the jar, means for holding the rotating means at a fixed distance from the cap-holding means, and means for sliding the jar toward the cap on said rotating means.

4. In a machine for capping screw-capped jars, automatic means for placing and holding the caps in a relatively fixed position, automatic means for placing a jar, rollers on which the jar is rotated by frictional contact therewith, pressure means for increasing the frictional contact, automatic means for moving the jar into the cap, means for holding the jar-rotating means at a fixed distance from the cap-holding means while the jar is being moved relative thereto into the cap, and automatic means for discharging the capped jar.

5. In a machine for capping screw-capped jars, automatic means for placing and holding the cap comprising a chute through which the caps are moved by gravity, means for locking a cap in fixed position, means for delivering the caps one at a time to the locking means, automatic means for placing the jars, roller means for rotating them, means for sliding them longitudinally of the rotating means seriatum into the respective caps, means for holding the jar-rotating means at a fixed distance from the cap-holding means, and automatic means for discharging the capped jars.

6. In a machine for capping screw-capped jars, automatic means for placing and holding the caps, automatic means for placing a jar and screwing it into its cap comprising a pair of horizontal rollers, means for depositing the jars one at a time on said rollers, means for pressing a rotating jar into a corresponding placed cap, and automatic means for discharging the capped jars.

7. In a machine for capping screw-capped jars, automatic means for placing and holding the caps, automatic means for placing a jar and screwing it into its cap comprising a pair of horizontal rollers, means for depositing the jars one at a time on said rollers, means for positively holding the jar against the rollers, means for moving the rotating jar longitudinally into a cap, and automatic means for discharging the capped jars.

8. In a machine for capping screw-capped jars, automatic means for placing and holding the caps, automatic means for placing a jar and screwing it into its cap, and automatic means for discharging the capped jar comprising a swinging frame on which the jar was capped, cam-means for releasing the held cap and cam means for releasing the frame whereby it will swing to an oblique position by gravity where the capped jar will roll off.

9. In a machine for capping screw-capped jars, means for placing and holding one of the jar-members to be assembled, means for placing the other jar-member, rotating roller means to rotate the last jar-member, and means to move the rotating jar-member

longitudinally of the rotating means toward the held member.

10. In a machine for capping screw-capped jars, automatic means for placing and holding the caps, automatic means for placing a jar and screwing it into its cap comprising a head mounted on ball-bearings on a reciprocating bar said head contacting the end of the jar, cam means for moving the rod in the direction of the jar to force the jar into the cap, and resilient means to retract the rod.

Signed at Indianapolis, Indiana, this the 30th day of November, 1920.

GEORGE E. FRAZIER.