Oct. 14, 1924. 1,511,966

J. G. HEWIT

CAN CAPPING MACHINE

Original Filed Nov. 17, 1919 3 Sheets-Sheet 1

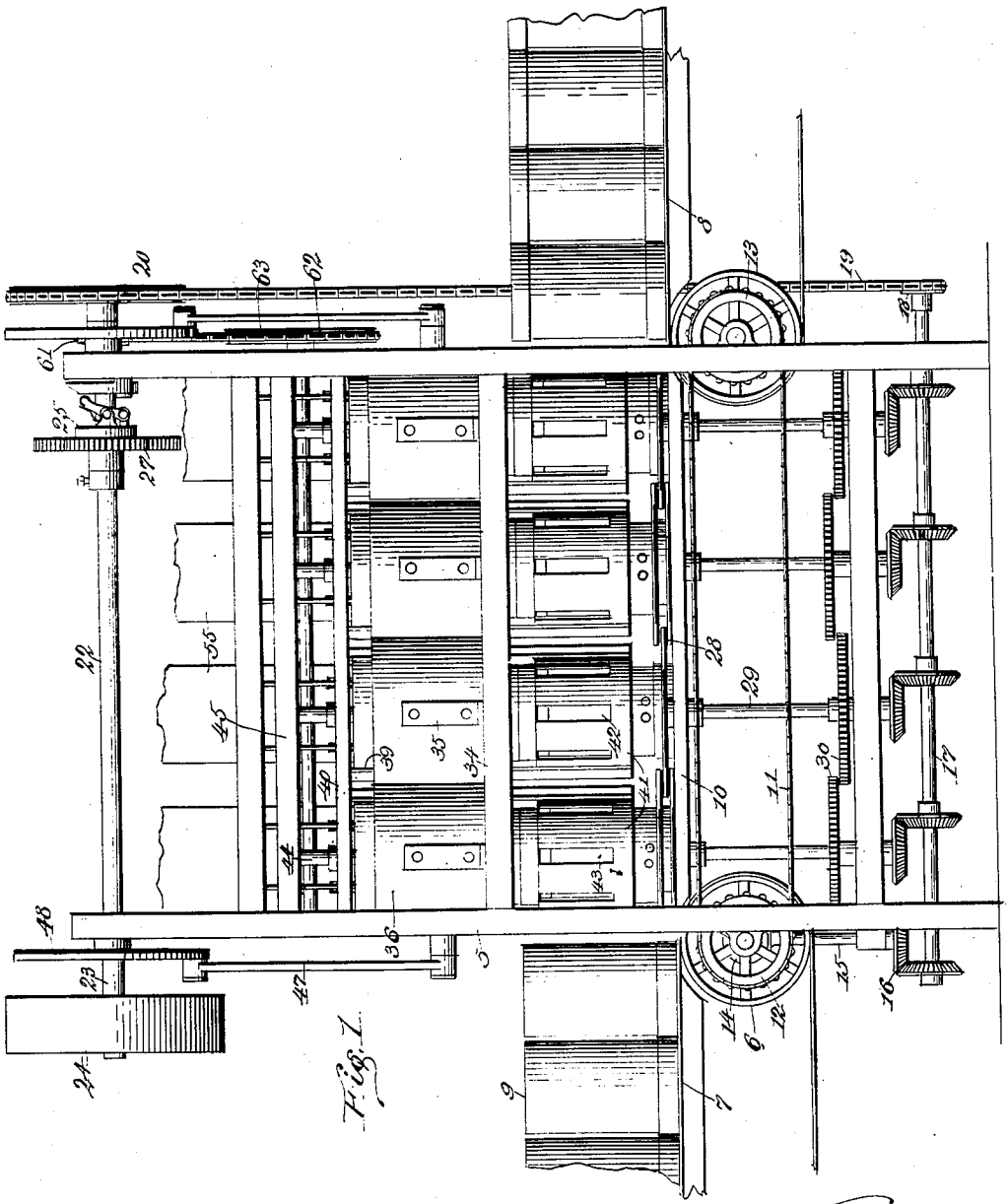


Fig. 1.

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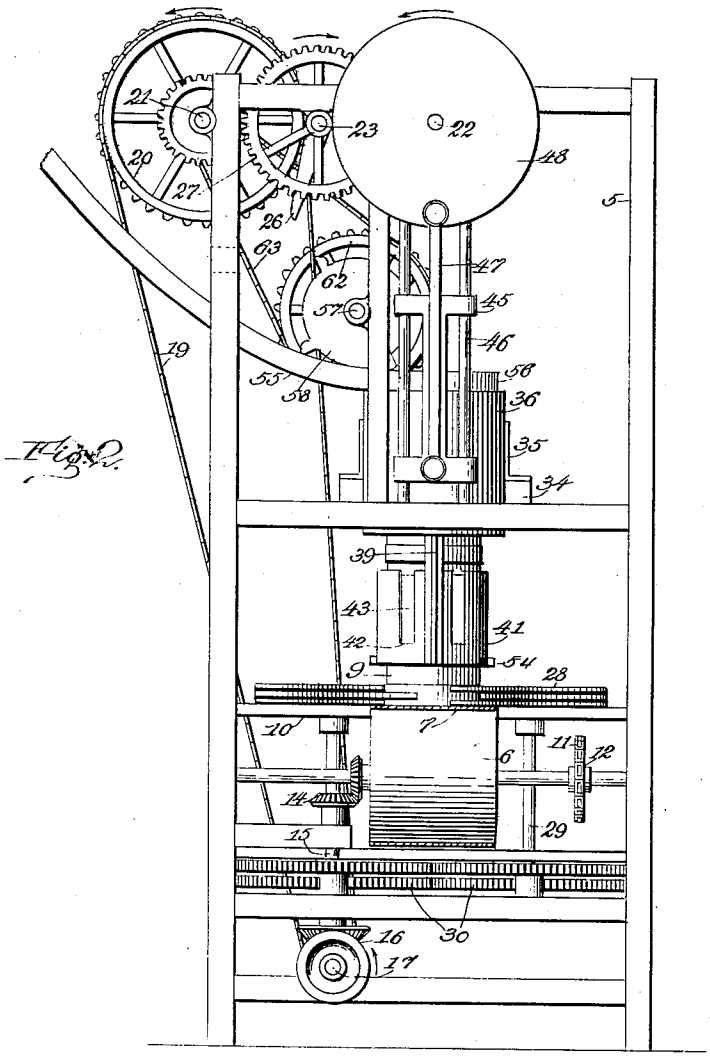


Fig. 2.

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Fig. 3.

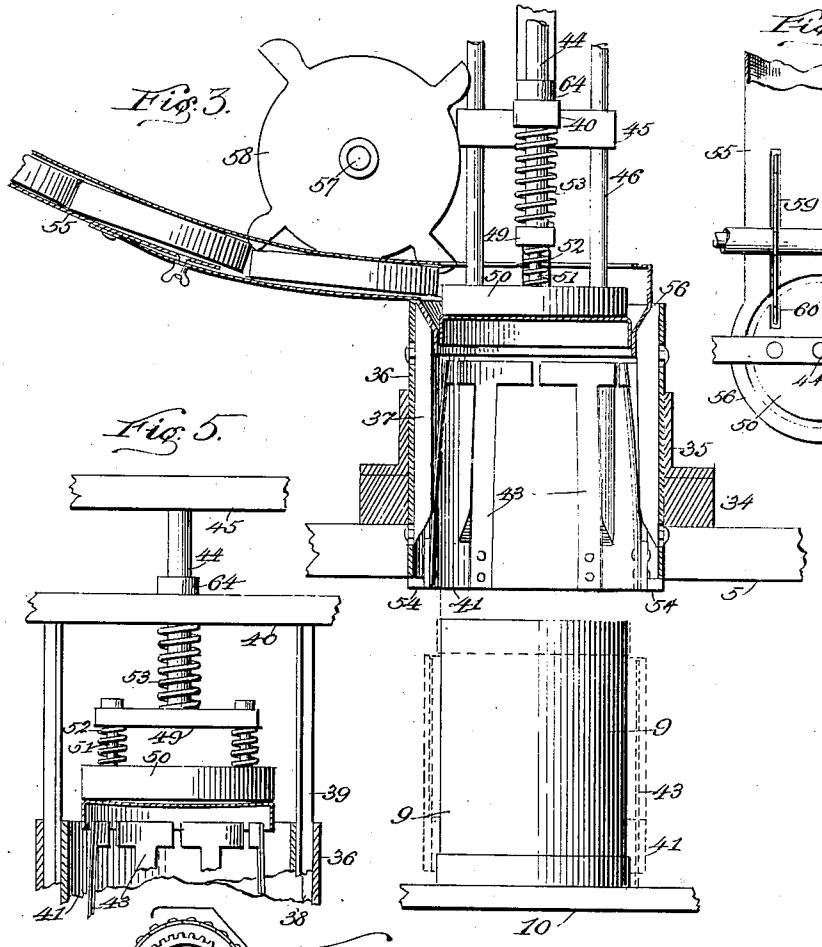


Fig. 4.

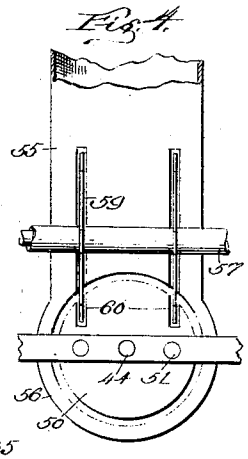


Fig. 5.

Fig. 6.

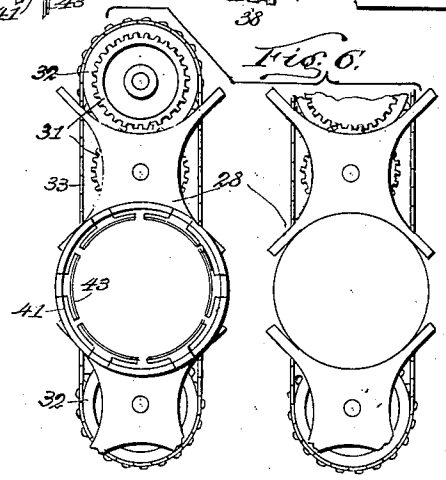
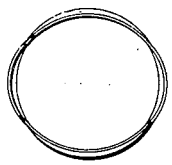


Fig. 7.



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UNITED STATES PATENT OFFICE.

JAMES G. HEWIT, OF CEDAR RAPIDS, IOWA.

CAN-CAPPING MACHINE.

Application filed November 17, 1919, Serial No. 338,513. Renewed March 13, 1924.

To all whom it may concern:

Be it known that I, JAMES G. HEWIT, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Can-Capping Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the sealing of paper packages, and more particularly to the affixing of paper covers to the cylindrical shells in which rolled oats and like commodities are packed for shipment and distribution.

In the packaging of oats, and the like, it is the common practice to fill the shells, already provided with bottoms, by automatic filling mechanism. From the filling machine the filled shells are carried on a conveyor between rows of operatives, who attach the covers by hand. This is a rather nice operation and requires not a little dexterity, as the flanges of the covers are made to fit very snugly to the shells, and to add to the difficulty, are never truly cylindrical, but in the process of drying, after being pressed into capping form, they warp into elliptical shape at the edges, which are very thin, and thereby emphasize the difficulty. It is therefore necessary to employ a considerable force of operatives to cap the shells filled by a single filling machine. This invention is designed to displace the hand work of capping altogether, and to perform the capping operation with certainty and neatness.

In the accompanying drawings, forming a part of this specification, Fig. 1 is a front elevation of a machine embodying my invention. Fig. 2 is an end view of the same. Fig. 3 is a vertical, cross-section, central to one of the cappers. Fig. 4 is a plan view, showing details of the cover feed mechanism. Fig. 5 is a sectional view of the capping apparatus, transverse to that shown in Fig. 3. Fig. 6 is a plan, with the table removed, view of feed mechanism for the shells, differing in some respects from that shown in other figures of the drawing. Fig. 7 is an inside view of one of the covers, and illustrates the warping thereof.

A main frame 5 carries conveyor shafts and drums 6 for conveyor aprons 7 and 8, which deliver the uncapped shells 9 to the working table 10, and carry them away therefrom when capped, respectively. The conveyors are actuated intermittently by connecting chain 11 and sprockets 12 and 13, and miter-gears 14, to which intermittent motion is imparted by a shaft 15 and gears 16 driven by a shaft 17. This shaft is provided with a sprocket 18, connecting by a chain 19 with a large sprocket 20 on a shaft 21. This shaft, and also the shaft 22 which actuates the capping apparatus, is driven intermittently by the main driving shaft 23, to which the driving pulley 24 is attached. The intermittent apparatus consists of single-revolution clutches 25, of a familiar type, attached to the shafts 21 and 22, and alternately tripped by means of an arm 26 attached to the main driving shaft, which by suitable gearing 27 is made to revolve twice as fast as the two driven shafts. This of course gives alternative action to the capping mechanism and the feed, one being stopped completely while the other is in action. A quadruple machine is illustrated, to correspond with the filling machine, not shown, which fills four shells at a time. It becomes necessary, therefore, to advance four shells at once, and for proper clearance, to advance them five spaces. This the conveyor aprons do, as will be evident from the drawing, showing the relative ratios in the feed mechanism. To deliver the capped shells to the removing conveyor, pairs of star-wheels 28, attached to vertical shafts 29, are mounted a little above the top of the central table 10, and embrace the shells each side near the lower ends, advancing them gear-wise as they revolve. To allow the arms of the star-wheels to pass each other, they are set in staggered order, as shown, preferably with two such wheels on one shaft, and one, intermediate wheel, on the adjacent shaft, so as to grip the shell snugly and hold it erect on the working table. For the same reason the large super-gears 30 which give opposite motion to the pairs of star-wheels are set in staggered order, as shown. The construction shown in Fig. 6 obviates this, however, the pairs of star-wheels being driven by small spur-gears 31, sprockets 32 and chains 33.

Suitably attached to supporting sills 34, as by brackets 35, is a gang of cylinders 36.

These are provided internally with inclined cams 37, preferably six in number. Internal guides 38 receive guide-bars 39, which at the upper end connect with a yoke 40, and the lower end with smaller cylinders 41, which latter are somewhat larger in diameter than the shells 9. Slots 42 in the smaller cylinders coincide with the cams of the larger one, and permit the smaller to pass up into the larger. To the smaller cylinders, below these slots, are secured springs 43, made T-shape, with the heads of the T's conforming to the inside curvature of the shell-cover flange. As shown in Figs. 3 and 5 the thrust of the cams is such as to bend these spring fingers inwardly, when the smaller cylinder is elevated, converging the T's until their area is considerably smaller than the inside of the cover flange. They are then ready to receive the cover easily, as indicated. The upper ends of the spring fingers should be very thin, since in capping the shell these fingers pass down outside the shell, and are finally stripped from between the shell and the cover flange, and unless quite thin they would tend to expand the flange undesirably.

The yoke carrying the spring fingers connects slidably with plunger-rods 44 secured to another yoke 45 mounted slidably on guides 46 attached to the main frame. This yoke connects by rods 47 with crank-wheels 48 carried by the shaft 22. To cross-bars 49 are connected plunger-heads, or followers 50, as by studs 51, with interposed springs 52. Between these cross-bars and the yoke 40 are springs 53, for a purpose which will presently appear. The upward movement of the gang of finger-holding cylinders is limited by stops 54 engaging the bottoms of the fixed cylinders.

Communicating with the upper ends of the fixed cylinders are chutes 55 to deliver the covers to the capping machine from the cover-forming press, not shown. The throats of the fixed cylinder are provided with hoppers 56, whose cylindrical lower ends correspond internally with the outer diameter of the cover flanges. This serves to admit the warped, elliptical cover flanges, but forces them to take cylindrical form as they are pressed downwardly out of the hopper by the followers. A shaft 57 carries a series of feed-disks 58, whose fingers engage the covers through slots 59 in the chutes, and corresponding slots 60 in the followers. A slow, intermittent rotation is imparted to this feed shaft by sprockets 61 and 62, and chain 63.

The operation of the machine is as follows:

Assuming the plunger-yoke to be at its uppermost position, which would carry the bottoms of the followers practically to the top of the hoppers, the action of this yoke is delayed until a gang of covers is fed under them, and a corresponding gang of shells is fed to cover-receiving position. The feed mechanism is then delayed, with the cover-receiving fingers converged and below the hopper, and the capping mechanism comes into action. Its first movement advances the covers downwardly until the cover flanges are part way over the curved upper ends of the fingers, which are held to this point of elevation by the springs 53 in co-operation with the stops 54. When the plunger-yoke has descended to the point indicated, stop-collars 64 positively engage the yoke 40, when both yokes descend together. When, however, the followers have pressed the covers fully on the shells, the shells themselves arrest any further movement of the followers, but the rest of the capping mechanism continues to descend to the limit of its down-stroke. At this point the fingers, which have embraced the shells, and positively guided the covers to capping position, have been stripped from under the cover flanges, and have sprung outwardly to normal position, as indicated by the dotted lines in Fig. 3, and entirely outside the cover flanges. The capping mechanism then makes its up-stroke and stops, completing the cycle of operations.

The central principle in this invention is the capping of a shell or can by means of thin blades or fingers interposed between the cover flange and the body of the shell, the fingers serving to positively guide the cover flange over and around the open end of the shell. This is believed to be novel, and is claimed basically. The mechanism by which the operation is carried into effect may of course differ widely from that herein shown, without departing from the spirit of the invention.

Having thus described my invention, I claim:

1. In a capping machine, a series of resilient shell-embracing fingers having thin, cover-receiving ends, a movable finger-holder, means to compress the free ends of the fingers, to receive the cover flange, the fingers expanding by their own resiliency, and a follower to press the cover on the shell.

2. In a capping machine, a series of thin-ended, shell-embracing fingers, a holder therefor, a yieldable follower, and means for moving the follower to capping position and the fingers to stripping position.

3. In a shell-capping machine, means for holding the shell, a series of shell-embracing fingers, a holder therefor, a follower to press the cover on the shell, and reciprocating mechanism to carry the follower away from the ends of the fingers to receive the cover; advance the follower in capping the shell; move the fin-

gers and follower concurrently thence; and finally strip the fingers from between the cover flange and the shell.

4. In a shell-capping machine, a series of shell-embracing fingers to receive on their ends the cover flange, a cover-receiving hopper concentric therewith, and having an outlet corresponding to the outer diameter of the cover, a follower to force the cover out of the hopper and over the fingers, and means for actuating the follower and fingers to apply the cover to the shell.

5. In a capping machine, a cover-carrying chute, a terminal hopper having an outlet corresponding to the outer diameter of the cover, a follower to force the cover therethrough, shell-embracing, thin-bladed fingers to receive the cover as discharged from the hopper, and means for actuating said follower and fingers to cap the shell, and strip the fingers from between it and the cover.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES G. HEWIT.

Witnesses:
F. W. ARMSTRONG,
J. M. ST. JOHN.