Aug. 1, 1939. I. KOTCHER 2,167,895

CARTON CAPPING MACHINE

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Fig. 1.

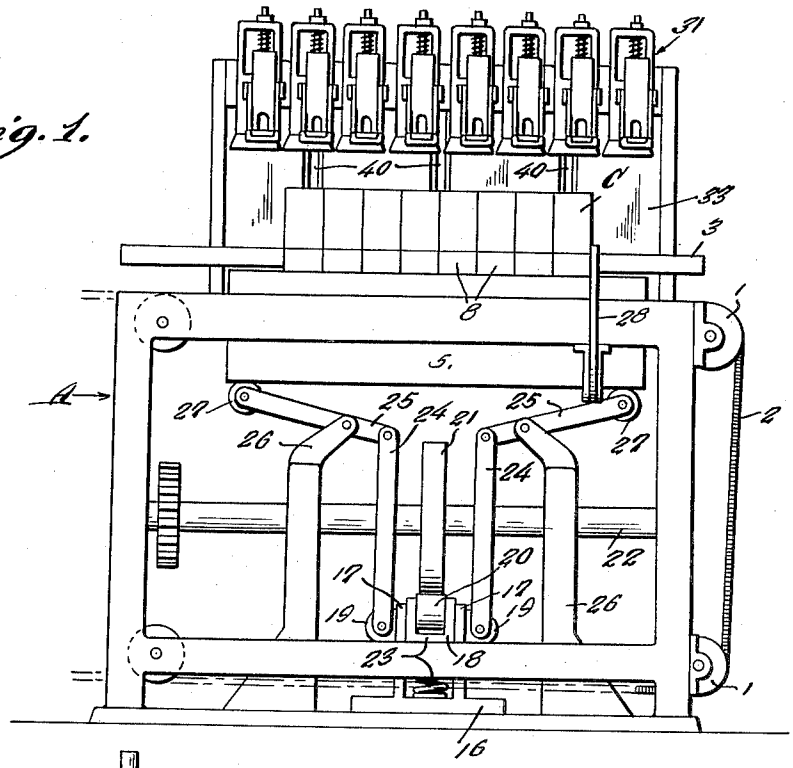


Fig. 8.

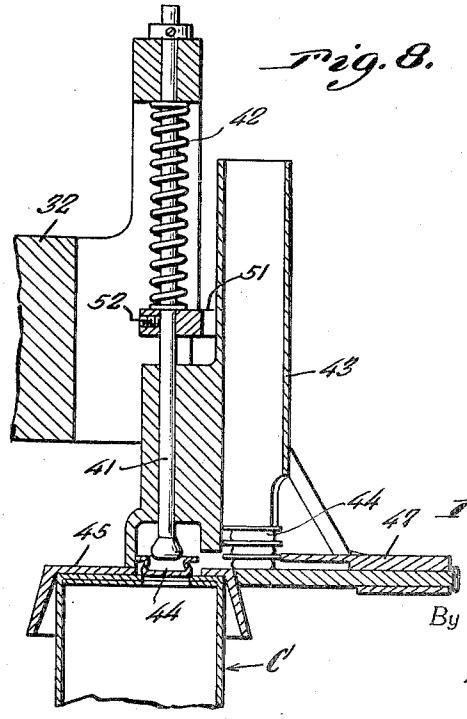
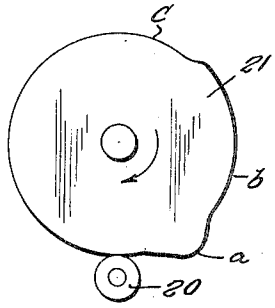


Fig. 9.



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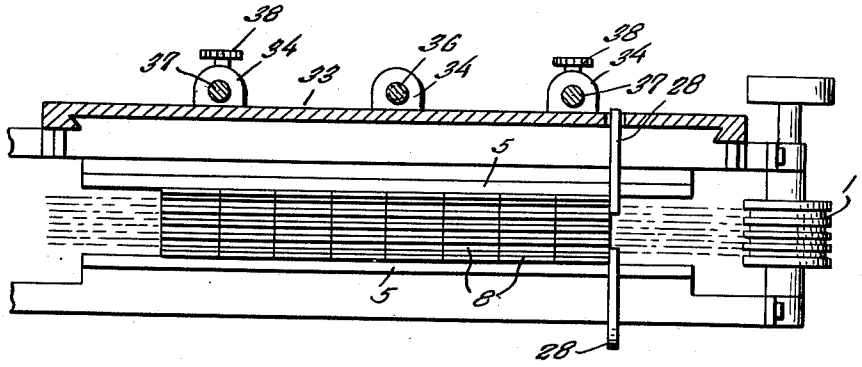
Attorneys

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Fig. 3.



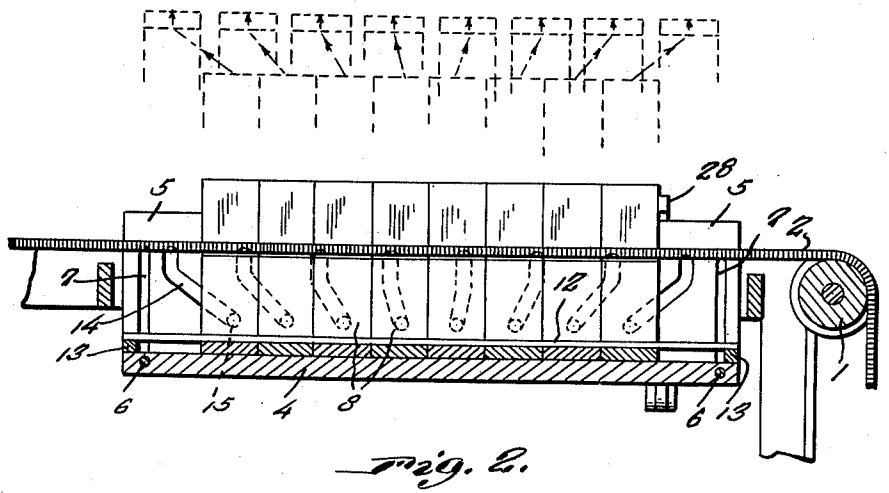


Fig. 2.

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Fig. 4.

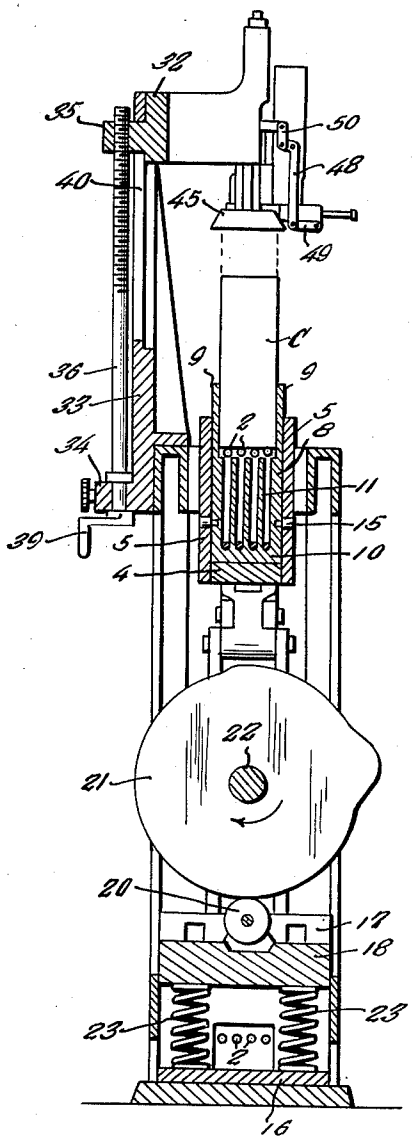


Fig. 5.

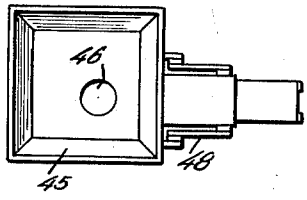


Fig. 6.

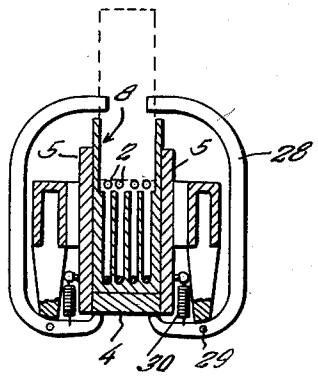
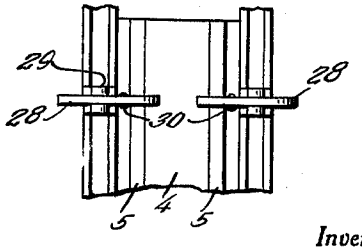


Fig. 7.



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UNITED STATES PATENT OFFICE

2,167,895

CARTON CAPPING MACHINE

Irwin Kotcher, Brooklyn, N. Y.

Original application May 19, 1937, Serial No. 143,583. Divided and this application October 8, 1938, Serial No. 234,064

5 Claims. (Cl. 226—92)

This invention relates to a carton capping machine, the present application being a division of an application filed by me on May 19, 1937, Serial No. 143,583.

The present invention together with its objects and advantages will be best understood from a study of the following description taken in connection with the accompanying drawings wherein:

Figure 1 is a side elevational view of the invention.

Figure 2 is a vertical sectional view through a part of the machine and showing the carton lifting and lowering means in full lines in lowered position and in dotted lines in raised position.

Figure 3 is a detail sectional view showing in top plan some of the parts shown in Figure 2 and some of the other parts of the machine.

Figure 4 is a vertical sectional view through the machine.

Figure 5 is a bottom plan view of parts of the capping means.

Figure 6 is a detail vertical sectional view through the raising and lowering means for the carton and showing the stop fingers for the carton.

Figure 7 is a top plan view of Figure 6.

Figure 8 is a detail vertical sectional view through the capping device.

Figure 9 is a view of the cam and the roller engaged thereby.

In these drawings the letter A indicates a supporting frame in which are rotatably supported the grooved rollers 1 for the conveyor 2 which is composed of a plurality of endless coiled springs, this conveyor conveying filled cartons C from a filling machine as described in the aforementioned application, horizontally extending guiding bars 3 being arranged one at each side of the cartons.

A horizontally arranged plate 4 is located between a pair of spaced guiding members 5 supported in the frame and said plate has the pins 6 passing through its end portions with their projecting ends operating in the vertical slots 7 formed in end portions of the guiding members 5. A plurality of jacks 8 is carried by the plate 4, each jack being formed of a pair of spaced side wall members 9, a bottom wall 10 and a plurality of blade-like members 11 extending upwardly from the bottom and spaced apart and much shorter than the members 9. Thus these jacks are of box-like form at the upper portion with their ends open to permit cartons to be moved thereinto by the conveyor, with the blades located below the upper reach of the conveyor and adapted to pass between the spring members of the conveyor when the jacks are lifted so as to lift cartons off the conveyor. The jacks are movably connected with the plate 4 by means of the longitudinally extending rods 12 having their ends connected to the strips 13 passing across the end portions of the plate and to which the ends of the rods 12 are connected, these rods passing through the lower ends of the spaces formed by the blades 7 and the side members 9 of the jacks. The guiding members 5 are formed with substantially bayonet-like slots 14, a pair for each jack and projections 15 extend from the side walls 9 of the jacks and engage the slots, the slots being so formed that as the jacks are carried upwardly by the plate 4 they will move apart, until they reach the vertical upper end portions of the slots and then they will move vertically upwardly for a short distance, as shown in dotted lines in Figure 2. Thus as the cartons are moved upwardly by the lifting and lowering means they are separated from each other and then as the lifting means moves downwardly the cartons are brought together and will be deposited upon the conveyor in substantially contacting relation as shown in full lines in Figure 2.

A base 16 is supported on a lower part of the frame and a pair of upright parts 17 is carried by the base and are spaced apart. These members 17 are formed with slots and a roller carrying member 18 is slidably arranged between the members 17 and has ears 19 thereon passing through the slots. The roller 20 of this member 18 is engaged by a cam 21 on a suitably driven shaft 22 journaled in the frame. A spring 23 is carried by the base 16 and presses the member 18 upwardly to keep the roller 20 in engagement with the cam 21. Links 24 are pivoted at their lower ends to the ears 19 and are pivotally connected at their upper ends to the inner ends of levers 25 pivoted intermediate their ends to the uprights 26 forming part of the frame and the outer ends of these levers 25 carry the rollers 27 which engage the lower face of the plate 4 so that this plate with the jacks thereon is raised when the member 18 is forced downwardly by the cam 21.

Stop fingers 28, of substantially U-shape, are provided for preventing the foremost carton being moved by the conveyor beyond capping position and these fingers are pivoted at their lower portions to parts of the supporting frame as shown at 29 in Figure 6. Springs 30 are connected at their upper ends to the members 5 and at their lower ends to the lower parts of the

fingers, these springs tending to hold the fingers in inoperative position so that their upper ends will not engage the carton. However, when the plate 4 is in its lowered position it will engage the lower ends of the fingers and move the upper ends of the fingers into position to engage a carton and thus prevent the carton from being moved by the conveyor as shown in Figure 6.

The capping devices 31 are of conventional form and are connected with a supporting member 32 and this member 32 is supported for vertical movement in a vertically arranged supporting structure 33 suitably supported from the top part of the frame A at the rear thereof. On the rear side and at the bottom thereof this member 33 is provided with the perforated lugs 34, see Figures 3 and 4, and the member 32 is formed with the rearwardly extending lugs 35, the center one of which is formed with a threaded hole to receive the threaded part of a screw shaft 36 which is rotatably arranged at its lower end in the center lug 34 of the member 33. Rods 37 have their upper ends connected with the outer lugs 35 of the member 32 and the lower ends slidingly pass thrcugh the the outer lugs 34 which carry the clamping screws 38 for clamping said rods 37 in adjusted position. The lower end of the screw shaft 36 is formed with a handle 39. Thus by loosening the screws 38 and turning the shaft the member 32 can be adjusted vertically in the member 33 and then by tightening the screws 38 the member 32 is held in adjusted position. This permits the capping devices 31 to be adjusted for use with different sizes of cartons. The lugs 35 of member 32 operate in slots 40 in the member 33.

As before stated the capping devices are of conventional form but Figures 5 and 8 show each device as including a plunger rod 41 supported for vertical movement and normally held in lowered position by a spring 42 with a hopper structure 43 slidably arranged on the rod, the hopper containing a plurality of caps 44. The hopper structure carries at its lower end a flanged member 45 the flange of which flares outwardly and downwardly for forming a space for receiving the upper end of a carton and the top of this member 45 is formed with an opening 46 which permits a cap to be forced by the plunger rod 41 into the hole in the top of the carton. A cap is moved from the hopper under the rod 41 by a slide 47 which is operated by the bellcranks 48 pivoted to opposite sides of the hopper structure and connected at their lower ends to the slide by the links 49 and connected at their upper ends by links 50 to a member 51 which is fastened to the rod 41 as shown at 52, with the spring 42 bearing against the member 51. Thus as a carton is lifted it is guided into capping position by the member 45 and the carton mc es the hopper structure upwardly so that the head at the lower end of the rod 41 will force a previously positioned cap 44 into the hole in the top of the carton and during this upward movement the bellcranks 48 move the slide 47 outwardly and then as the hopper structure moves downwardly upon lowering of the carton the bellcranks move the slide to position another cap from the hopper under the rod 41.

As shown in Figures 4 and 9 the cam 21 is provided with a short high part *a*, a long intermediate part *b*, and a longer low part *c*. Thus when the low part *c* is engaging the roller 20 the plate 4 with the jacks thereon is in fully lowered position and as the plate is engaging the lower ends of the stop fingers 28 these fingers are in a position to stop the foremost carton when it is brought to the position shown in Figure 1 by the conveyor. Thus the conveyor will position a group of cartons in capping position as shown in Figure 1 and then when the high part *a* of the cam engages the roller 20 the arms 25 will be swung upwardly so that the rollers 27 will lift the plate 4 so that the plate moves from out of engagement with the lower ends of the fingers 28 which permit the springs 30 to swing the fingers to releasing position but before this occurs the jacks have moved the cartons off the conveyor and as the jacks move upwardly they will be separated by the pins 15 moving upwardly through the slots 14, as shown in Figure 2. Thus the cartons are separated and their upper ends are placed in the members 45 of the capping devices and the caps 44 forced into the holes at the upper ends of the cartons. Then the intermediate part *b* of the cam engages the roller 20 so that the plate 4 with the jacks is lowered to place the cartons back upon the conveyor but said plate 4 is not lowered sufficiently to engage the fingers 28 so that these fingers remain in inoperative position to permit the capped cartons to be moved from under the capping devices by the conveyor. Then the low part *c* of the cam engages the roller 20 which permits the plate 4 to move to fully lowered position and this moves the fingers 28 to operative position so as to stop a new group of cartons in capping position.

Having described the invention, what is claimed as new is:

1. In a receptacle capping device of the class described, a supporting frame, a pair of spaced guiding members supported by the frame, an elevator movable between the guiding members, a plurality of jacks mounted on the elevator, each engaging a receptacle, means for operating the elevator, capping means at the top of the frame for applying caps to the receptacle when lifted by the elevator and jacks and inter-engaging means on said jacks and on said guiding members coacting to cause said jacks to separate when the jacks move upwardly and to move toward each other when the jacks move downwardly.

2. In a receptacle capping device of the class described, a supporting frame, a pair of spaced guiding members supported by the frame, an elevator movable between the guiding members, a plurality of jacks mounted on the elevator, each engaging a receptacle, means for operating the elevator, capping means at the top of the frame for applying caps to the receptacle when lifted by the elevator and jacks and inter-engaging means on said jacks and on said guiding members coacting to cause said jacks to separate when the jacks move upwardly and to move toward each other when the jacks move downwardly, means for conveying cartons over the jacks and means controlled by the movement of the elevator for preventing movement of the receptacles by the conveyor when the receptacles are in capping position and then to permit the receptacles to move with the conveyor upon lowering of the receptacles back upon the conveyor.

3. In a carton capping device, a supporting frame, a conveyor for the cartons, a pair of spaced guiding members in the frame between which the conveyor passes, an elevator movable between the guiding members, a plurality of jacks carried by the elevator, means for separating the jacks as the elevator moves upwardly

to cause the jacks to lift the cartons off the conveyor and to separate the cartons, said means moving the jacks together when the elevator is lowered, capping means at the top of the frame and engaged by the upper ends of the cartons when the same ar lifted for applying caps to the cartons, a cam, means for rotating the same, means actuated by the cam for raising and lowering the elevator, a pivoted stop finger for preventing movement of the cartons by the conveyor beyond capping position, spring means for normally holding the finger in inoperative position, said elevator when in lowered position holding the finger in operative position and said cam having a part thereon holding the elevator in slightly raised position and out of engagement with the stop finger, after the capped cartons have been replaced on the conveyor, to permit the conveyor to move the cartons out of capping position, after which the elevator moves to fully lowered position to move the finger into holding position.

4. In a device of the class described, a pair of spaced guiding members, an elevator movable between the same, a plurality of jacks seated on the elevator, projections extending from the sides of the jacks and said guiding members having substantially bayonet-like slots therein for receiving the projections, said slots and projections causing the jacks to separate when the elevator moves upwardly and to come together when the elevator moves downwardly and means for actuating the elevator.

5. In a device of the class described, a pair of spaced guiding members, an elevator movable between the same, a plurality of jacks seated on the elevator, projections extending from the sides of the jacks and said guiding members having substantially bayonet-like slots therein for receiving the projections, said slots and projections causing the jacks to separate when the elevator moves upwardly and to come together when the elevator moves downwardly and means for actuating the elevator, said elevator having projections at its side edges and the guiding members having vertical slots therein receiving the projections.

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