March 12, 1929. M. E. BRIGHAM 1,705,082

MACHINE FOR STUFFING AND CAPPING CANS

Filed May 28, 1927 4 Sheets-Sheet 1

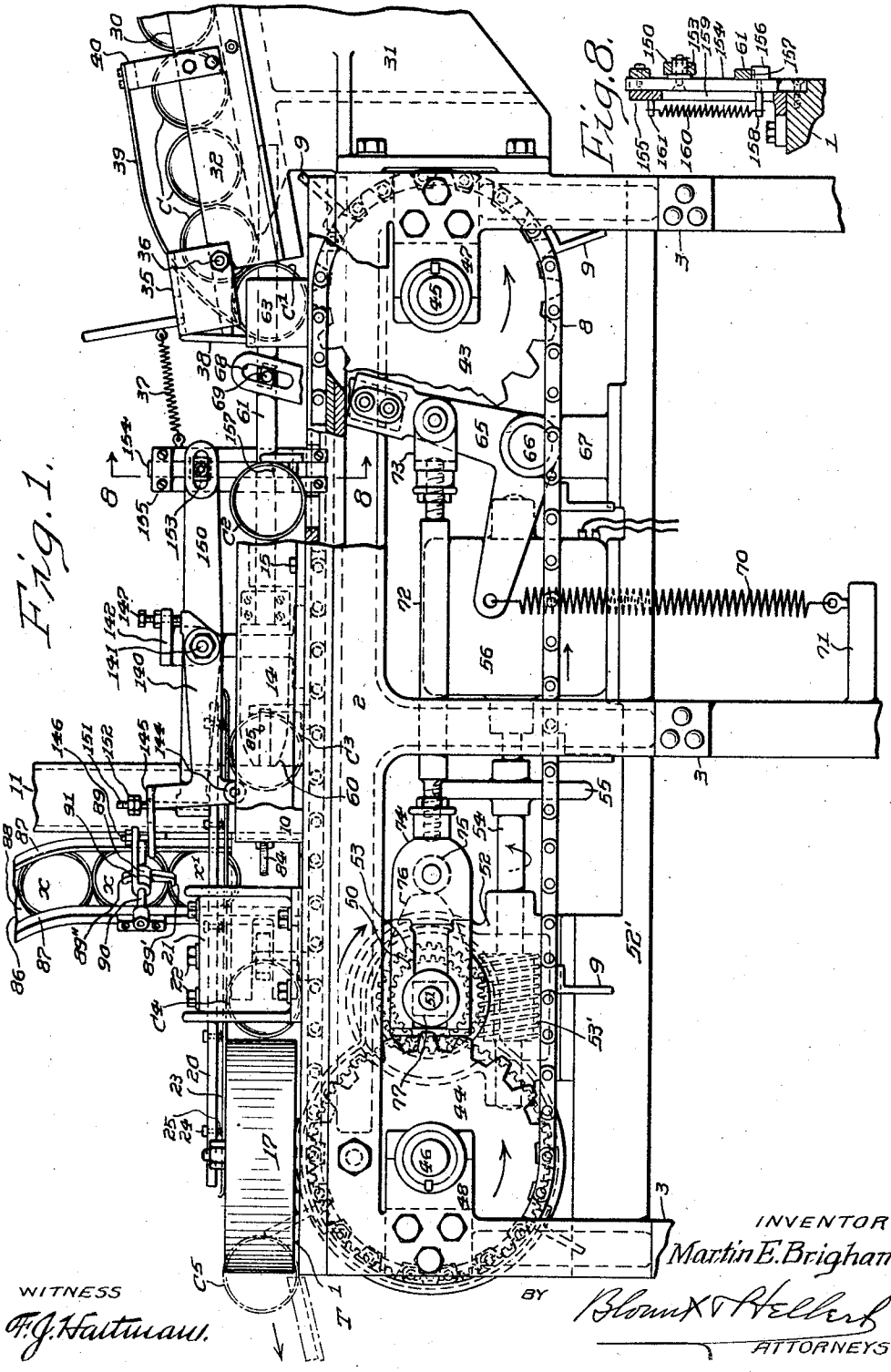


Fig. 1.

Fig. 8.

WITNESS
F. J. Hattuaw.

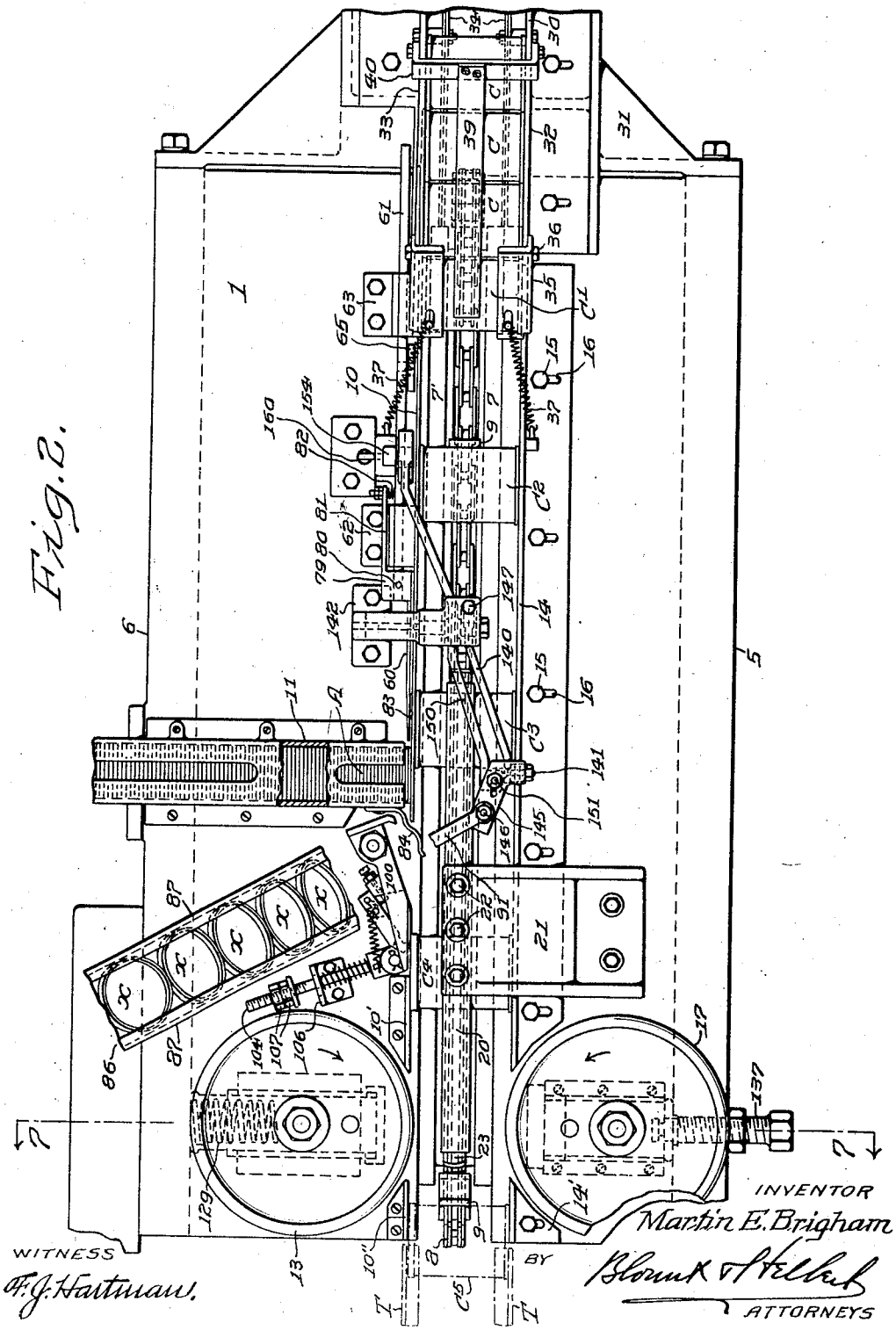
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MACHINE FOR STUFFING AND CAPPING CANS

Filed May 28, 1927 4 Sheets-Sheet 2

Fig. 2.



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MACHINE FOR STUFFING AND CAPPING CANS

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Fig. 3.

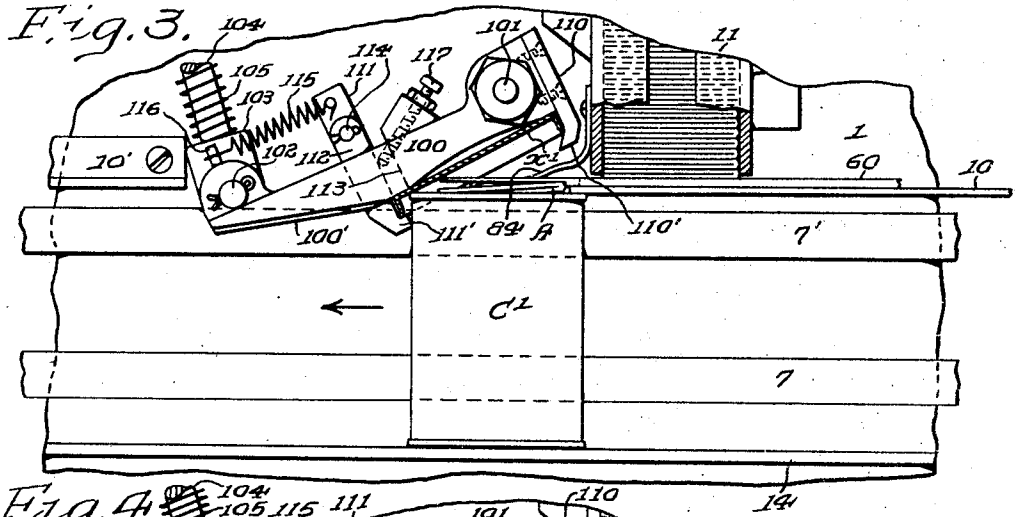


Fig. 4.

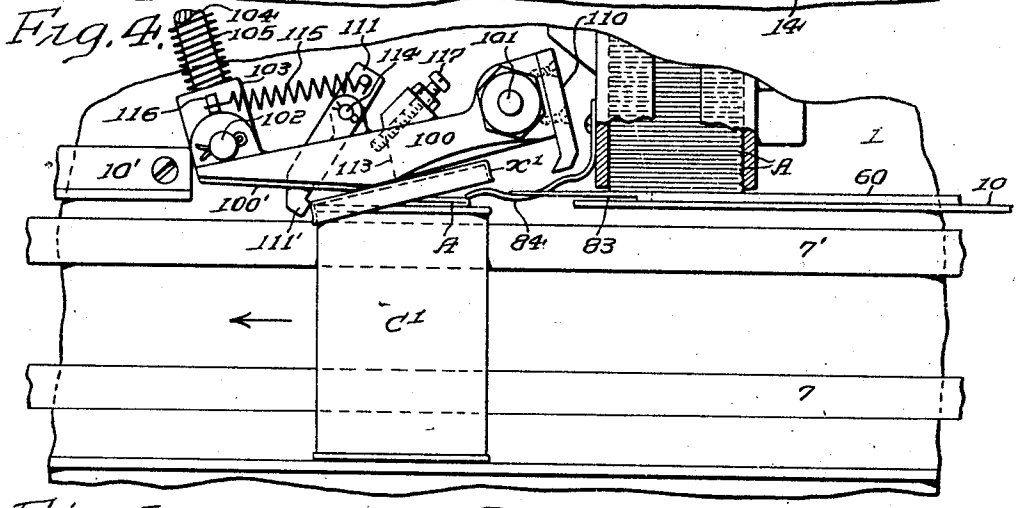


Fig. 5.

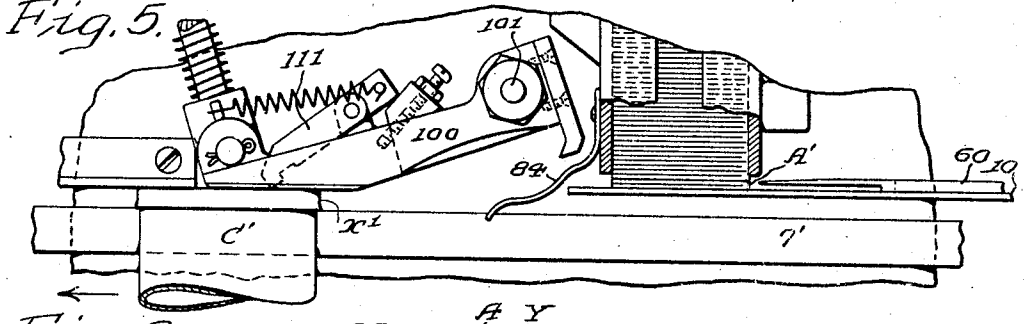
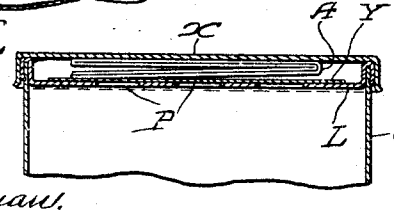


Fig. 6.



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MACHINE FOR STUFFING AND CAPPING CANS

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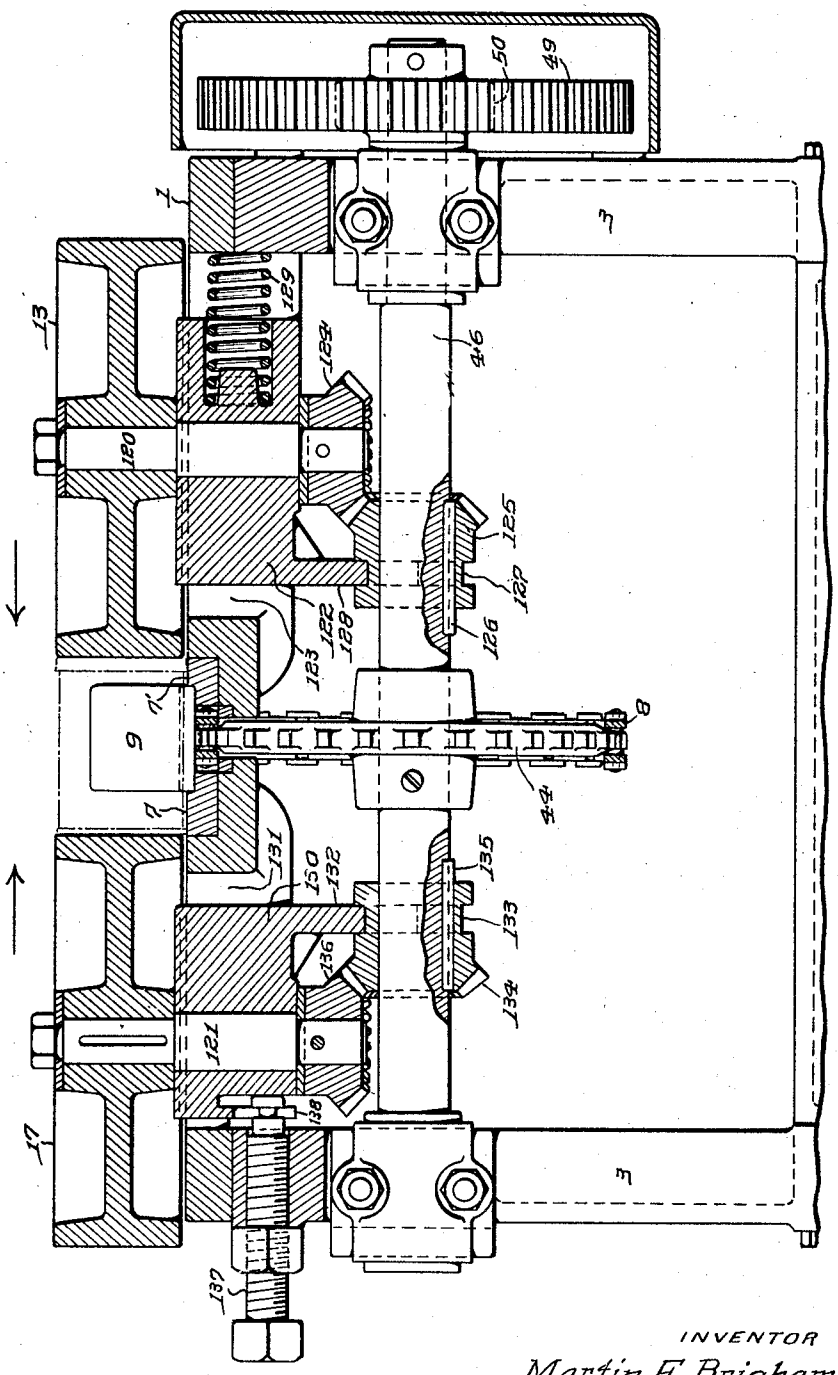


Fig. 7.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR STUFFING AND CAPPING CANS.

Application filed May 28, 1927. Serial No. 195,040.

It is customary to market lye, bleaching powder and other chemicals intended for household use and the like in metallic cans comprising a cylindrical body and a perforated top or lid which is permanently secured to the body after the contents are placed in the can, the perforations being temporarily closed by a paper label pasted on the upper side of the lid and adapted to be punctured by the user when it is desired to shake or sift out the contents of the can through the perforations. To protect the label from being accidentally punctured in transit or handling as well as to provide means for conveniently closing the can after the label has been punctured and during the intervals between the times when portions of the contents are shaken out, it is usual for the manufacturer to place over that end of the can having the perforated top a peripherally flanged cap of tin or like material which is removably retained on the can by frictional engagement of its flange either directly with the wall of the can adjacent the top or, more frequently, with a slight outwardly projecting bead formed adjacent the point of juncture of the top and the end of the can by the crimping of the marginal edge of the top over the end of the can when the top is permanently secured thereon. It is further customary to dispose between the cap and the top, or rather the outer surface of the paper label which is pasted on the top, a sheet of paper giving directions for use of the contents of the can, this sheet, which is ordinarily of rectangular form and several inches in width and length, being compactly folded to a size small enough to enable it to rest on the top and be covered and enclosed by the cap. Thus when the user removes the latter from a new can the folded sheet of directions is exposed to view so it may be readily lifted off, unfolded and read before the label on the permanent top is punctured preparatory to shaking out a portion of the contents of the can. After the desired quantity of the contents has been shaken out the cap is ordinarily replaced by hand to prevent the remainder of the contents from spilling out or contamination or deterioration through contact with the atmosphere and is again removed when it is desired to shake out an additional quantity. As the sheet of directions when folded to the proper size to lie on the can top without overhanging the margin thereof is of appreciable thickness, it would to some extent prevent the cap from being forced snugly down on the end of the can if the can top were flush throughout its extent; it is therefore usual to somewhat depress the central part of the top below its marginal edge during its process of manufacture; additionally, this relative depression of the center of the top is somewhat emphasized when the margin of the top is bent up and crimped down over the end of the can when the top is affixed thereto. Thus a circular depression or recess extending inwardly for an appreciable depth is present throughout substantially the entire area of the top after its attachment to the can and provides a convenient receptacle for the folded sheet of directions which lies snugly in the recess and thus presents no obstacle to the proper positioning of the cap upon the end of the can.

Hitherto the placing of the folded sheet of directions in the recess in the top of the can (which is known in the art as "stuffing") after the can has been filled and the top, with its perforations closed by the paper label, permanently secured in position, as well as the application of the removable cap over the end of the can and the directions and the forcing it into place so it will be frictionally retained thereon, have been performed entirely by hand and it is the object of the present invention to provide mechanical means for effecting these operations automatically and with great rapidity.

For the performance of these intended functions I therefore arrange suitable means and instrumentalities in corelated and coordinated relation to form an organized machine adapted, among other things, to consecutively feed the filled and sealed cans in a predetermined direction as they are received from a magazine or conveyor, to remove from a suitable magazine a single folded sheet of directions or other substantially similar article and apply it to the top of each can as the latter reaches a predetermined point in its path of travel, to consecutively feed the caps from a magazine and position a single cap with respect to the path of each can so that the end of the latter while the folded directions are held against its top will initially meet and enter the cap when the latter occupies an angular

position with respect to the path of travel of the can whereby the cap through its engagement with the can and as the latter progressively moves forward is caused to move into proper registry with the can and engage thereon, and to finally press the cap firmly into place and eject the capped can from the machine, conveniently onto a suitable conveyor by which it may be removed to any point for packing or the like.

While for accomplishing the foregoing and other operations incident or requisite for the satisfactory performance of a machine adapted for carrying out the objects of the present invention any suitable means or instrumentalities may be employed, I have illustrated in the accompanying drawings and will now proceed to describe for the purpose of enabling those skilled in the art to practice the invention, one form of machine constructed in accordance therewith and which has been found in practice as entirely satisfactory in operation and well adapted for its intended purposes. It will, however, be understood that it is not my intention or desire to thereby confine or limit myself to the utilization of any particular means for the performance of any or all of the various coordinated and correlated functions of the machine, more especially as I believe it to be broadly new to utilize mechanical means for the consecutive performance of the several operations requisite or desirable for applying a folded sheet of paper or the like to an end of a can and thereafter placing a cap thereover in such manner that it will be firmly but removably retained in position thereon.

In the said drawings Fig. 1 is a front elevation of the machine with the lower portions of the supporting uprights omitted and Fig. 2 is a top plan view thereof, certain parts being broken away in both views to better show details of construction. Fig. 3 is a materially enlarged fragmentary top plan view of the cap holding means and adjacent parts showing the position of said means and of the cap held thereby at the moment when the moving can which is to receive the cap comes into contact with the latter; Fig. 4 is a similar view showing the relative position of the cap holding means, cap and can when the latter has progressed somewhat from the position shown in Fig. 1, and Fig. 5 is a substantially similar view showing the relation of the parts when the can has progressed still further along its path of travel. Fig. 6 is a fragmentary section through the end of the can after the cap has been fully applied thereto, the plane of the section coinciding with a diameter of the can; Fig. 7 is an enlarged transverse vertical section through the machine on the line 7—7 in Fig. 2 looking in the direction of the arrows, and Fig. 8 is a fragmentary vertical section on line 8—8 in Fig. 1 also looking in the direction of the arrows. The same symbols are used to designate the same parts in the several figures.

Generally speaking, the machine as illustrated comprises a top plate supported on suitable legs or uprights and a shelf disposed between the uprights at a suitable distance below the top plate, this shelf being utilized to support an electric motor which may be conveniently employed for driving the machine as well as certain of the gearing by which the motor is connected with the parts which it serves to actuate. The top plate is adapted, among other things, to support a pair of laterally spaced rails along which the filled cans are caused to travel at spaced intervals, as they are consecutively received on the rails, by means of dogs carried by a chain extending between the rails and running over sprockets disposed beneath and adjacent opposite ends of the table. Mechanism is also provided for selectively removing from a suitably disposed magazine the folded sheet of directions or like article and for then applying the same to the top of the can as the latter in its passage along the rails attains a predetermined station or position, as well as means for releasing from a suitable conveyor the cap which is to be applied to the can, means for receiving the cap from the conveyor when so released and holding it in a substantially vertical position in horizontal alignment with the can but in angular relation thereto so that the leading edge or corner of the can as it moves progressively forward will first engage the cap substantially in the angle formed between the flange of the cap and its central part and adjacent that portion of the cap nearest that end of the table toward which the can is moving, so that as the can continues to move the cap will gradually swing inwardly toward the end of the can until it registers therewith, the cap holding means being operative during this movement of the cap to gradually release it, means for pressing the cap into place on the end of the can after it is brought into such registry and means for ejecting the can from the machine after the cap has been so pressed into place. Furthermore, in order to guard against and prevent the feeding of both the folded directions and the can caps from their respective magazine and conveyor when, for some reason such as an interruption in the supply of cans, there is no can being brought to a position to receive them, means are provided for controlling the operation of the direction feeding mechanism and also of the cap feeding mechanism through the medium of the cans themselves as they consecutively pass through the machine so that unless a can is being moved along the rails by the

can conveyor toward the stations at which the directions and thereafter the cap are to be applied to it, the feeding mechanisms both for the directions and for the caps remain inoperative, thus avoiding both wasting the directions and caps and also any clogging of the machine which might occur if these articles were fed into the path of the cans when no cans were approaching to receive them.

Such, in brief, is the general arrangement and operation of the machine which I have chosen to illustrate as a preferred embodiment of my invention and the several means, instrumentalities and mechanisms utilized for accomplishing the various operations to which reference has just been made in a general way as well as other operations incident or relating thereto will now be described with somewhat greater particularity.

The particular embodiment of the machine which I have chosen to illustrate comprises a horizontally disposed table 1 supported on a frame 2 which in turn is supported on uprights or legs 3 whose lower ends (not shown) may rest on a floor or other support. This table is provided with a longitudinally extending track along which the cans as they are consecutively received from a suitable conveyor adjacent one end of the table are positively conveyed until they are ejected from the machine at the other end of the table after the various functions incident to stuffing and capping the cans have been performed, and while this track may be arranged in any suitable way I prefer to provide the table with a longitudinally extending depression which may be slightly offset toward the front edge 5 of the table so it will lie a little nearer that edge than the rear edge 6 thereof and dispose in said depression rails 7, 7′ which, as shown in Fig. 7, may be spaced apart sufficiently to permit the conveyor chain 8 hereinafter more particularly described to move freely between them. The upper inner corners of these rails may also be respectively chamfered out slightly to receive the corners of the conveyor dogs 9 carried by the chain at spaced intervals and which are operative to move the cans along the rails. Paralleling and slightly in rear of the rail 7′ is disposed a vertical longitudinally extending guide plate 10 whose height is preferably slightly less than the diameter of the cans; this plate extends uninterruptedly from a point adjacent that end of the table at which the cans are received, and which is the right hand end of the machine when viewed as in Figs. 1 and 2, to a point slightly beyond the article magazine, generally designated as 11, in which are disposed the articles which are to be stuffed; the plate is then interrupted for a short distance to provide a sufficient space for the interposition of the cap holding and applying means and is then in effect continued by a short section 10′ interposed between said means and the adjacent presser wheel 13 hereinafter more particularly described, and again in effect continued on the opposite side of said wheel in a short section 10″ extending to the edge of the table, so that the guide plate 10 with its supplemental sections 10′, 10″ is substantially continuous from one end of the table to the other save at the gaps formed in it adjacent the cap holding means and the presser wheel. In like manner a complemental guide plate 14 is arranged parallel to and in front of the rail 7; this plate may conveniently be made of angle iron and secured in position on the table by bolts 15 extending through slots 16 in its horizontal flange, thus enabling the plate to be adjusted in or out with respect to the rails to thereby accommodate the machine to cans of different lengths. The plate 14 may extend uninterruptedly from a point adjacent the end of the table at which the cans are received to a point adjacent the other presser wheel 17, is then interrupted so as to expose the face of the wheel and again in effect continued on the opposite side of the wheel by a short section 14′ generally corresponding to the section 10″ of the other rail. It will thus be apparent that as the cans are moved along the track they are restrained from endwise movement, that is, movement in a direction parallel to their central axes by the vertical flanges of the guide plates and thus constrained to move in a definite and straight path. Additionally, to insure the cans being pressed snugly down upon the rails during that portion of the travel of each can at which the several operations incident to stuffing and packing it are performed, I provide above the path of the cans a longitudinally extending guide bar 20 carried by an overhanging bracket 21 bolted to the table and to which the bar is in turn secured by bolts 22. This bar is disposed about midway between the rails 7, 7′ at a distance thereabove somewhat greater than the diameter of the cans and is arranged to extend from a point somewhat nearer the can receiving end of the machine than the magazine 11 to a point somewhat past the centers of the presser wheels 13 and 17. To insure the cans being pressed downwardly on the rails with a firm yet yielding pressure I dispose beneath the bar a strip 23 of spring steel or other substantially similar flexible material and support the same from but in downwardly spaced relation to the bar by means of a plurality of longitudinally spaced studs 24 whose lower ends are secured to the strip and whose upper ends extend freely through holes in the bar and are provided with heads thereabove, and as each of these studs is surrounded by

a coil spring 25 between the under face of the bar and the upper face of the strip the latter is continuously pressed downwardly by the action of the springs to thereby exert a corresponding downward pressure upon the cans as they pass beneath it, it being of course understood that the position of the bar and length of the studs are so determined that the under face of the strip will normally lie at a height above the rail slightly less than the diameter of the cans so that as the cans pass beneath the strip the latter will be raised slightly against the compression of the springs 25 and thus exert the desired downward yet yielding pressure on the cans. Furthermore, it will be observed that as the strip is flexible and as it is capable of readily yielding vertically on account of the manner in which it is supported, the strip can readily accommodate itself to any slight variations in the diameter of the can bodies or inequalities in their respective surfaces.

Can supplying mechanism.

As stated, the filled cans with their tops or ends secured in place are consecutively fed to the receiving or right hand end of the machine in any convenient way and preferably by means of an inclined conveyor generally designated as 30 and which may be of any suitable construction; thus, for example, the conveyor may be supported on a bracket 31 bolted to the end of the machine and may comprise spaced plates 32, 33 aligned with the guide plates 10 and 14 and between which are positioned tracks 34 for supporting the cans C. Preferably the discharge end of the conveyor extends slightly over the adjacent end of the table and is disposed somewhat thereabove so that as the cans pass out of the conveyor they will drop down on the subjacent ends of the rails 7, 7'. To prevent the cans from rolling along on the rails as they pass thereonto from the conveyor and also to hold the leading can in proper position to receive the conveyor dog which is to move it along the rails in its passage through the machine, a gate 35 may be pivoted to the forward end of the conveyor as by a pivot bolt 36 for movement in a vertical plane and a pair of springs 37 connected with the gate and some suitable fixed point in such manner as to pull the gate downwardly so as to interpose the lower end of an apron 38 extending transversely across the gate into the path of the cans and thus hold the leading can C^1 adjacent the end of the conveyor as clearly shown in Fig. 1 until it is engaged by the conveyor dog and thereafter positively moved toward the discharge end of the machine, thus raising the gate against the pull of the springs 37 and permitting the can to pass thereunder. As soon as the leading can is thus cleared beneath the gate the next can moves forwardly and downwardly from the conveyor to a position beneath the gate and remains there until it, in turn, is engaged by the next conveyor dog and thereby carried past the gate. If desired, a flat downwardly curved overhanging spring 39 may be arranged above the end of the conveyor and supported on a bracket 40 secured thereto in such manner that its free end will extend beneath the gate and engage the leading can to assist in holding the latter in proper position beneath the gate for engagement by the approaching conveyor dog.

Can conveying mechanism.

The conveyor dogs to which reference has been made are arranged at properly spaced intervals on the conveyor chain 8 which passes around sprockets 43, 44 respectively mounted on shafts 45, 46 extending transversely beneath the table adjacent opposite ends of the machine and suitably journaled in brackets 47, 48 carried by the adjacent supporting legs, the dogs, as best shown in Fig. 7, being preferably of generally rectangular shape and of suitable width and height to readily move between the guide plates 10 and 14 and to engage the cans. The shaft 46 is positively driven through the medium of a gear 49 mounted on the end of the shaft, conveniently at a point outside the line of the table, and meshing with a pinion 50 on a shaft 51 journaled in a casing of suitable form and generally designated as 52 which is supported on a shelf 52' disposed beneath the main table 1 and secured to the legs 3. Within this casing and also mounted on the shaft 51 is a worm gear 53 cooperative with a worm 53' on a longitudinally extending drive shaft 54 also journaled in the casing and which may, exteriorly of the casing, be provided with a hand wheel 55 and extended to a motor 56 also supported on the shelf and which is operative to supply the power for driving the machine. Thus, when the motor revolves the shaft 54 and worm 53', shaft 51 is driven through the medium of the worm gear 53 in turn rotating pinion 50 to drive shaft 46 and sprocket 44 in the direction indicated by the arrow upon said sprocket in Fig. 1, thus positively causing movement of the chain 8 in the direction of the arrow disposed adjacent the chain in the said figure and revolving sprocket 43 and idler shaft 45 upon which it is mounted. It will thus be apparent that whenever current is supplied to the motor rotation of shaft 51 and positive movement of chain 8 will be effected so that the conveyor dogs 9 carried by the chain will be consecutively moved beneath the gate 35 to engage the cans as they are fed behind

the gate from the conveyor 30 and to thereafter move them at predetermined spaced intervals along the rails 7, 7'.

Article feeding and stripping means.

Reference has hitherto been made to the magazine 11 in which the folded sheets of directions or other articles which are to be stuffed beneath the can lids or caps are disposed. This magazine, which may be of any suitable form for holding the articles, is disposed at a point about midway between the receiving and discharge ends of the machine at right angles to the path of travel of the cans along the rails 7, 7'. The lower or forward end of the magazine terminates closely adjacent the outer face of the guide plate 10 and from this point preferably extends horizontally toward the rear edge 6 of the table and is then carried upwardly in an easy curve to a substantially vertical position so that as the articles are placed in the upper end of the magazine they will readily feed downwardly in the same; preferably the natural tendency of the articles to feed down by gravity may be supplemented by a weight or other suitable follower (not shown) which is placed on the upper end of the stack and is slidable in the magazine so as to insure the leading article being constantly pressed against the outer face of the guide plate 10 which forms a stop therefor.

For removing or stripping the leading article from the stack in the magazine and carrying it in properly timed relation with the movement of the can to the point or station at which it is applied to the end of the can, suitable means are provided which preferably comprise a vertically disposed, horizontally movable stripper 60 secured to the end of a horizontally disposed slide 61 which extends parallel to the guide plate 10 and lies a short distance outside thereof, the slide being supported by and freely slidable in brackets 62, 63 secured to the table. The reciprocation of this slide is effected through the medium of a bell crank 65 pivoted for vertical movement on a pivot 66 carried by a bracket 67 secured to the shelf 52'. One arm of this bell crank extends to a point adjacent the slide where it is provided with a slot 68 for the reception of a pin or block 69 carried by the slide; the other arm of the crank extends from the pivot generally in the direction of the discharge end of the machine and is connected to one end of a spring 70 the other end of which may be connected to a lug 71 carried by one of the uprights 3, the arrangement being such that the spring constantly tends to pull the adjacent crank arm downwardly and thus move the slotted arm of the crank toward the discharge end of the machine to thereby effect a corresponding movement of the slide. Cam actuated mechanism is also provided for positively moving the crank 65 in a direction opposite to that in which the spring 70 tends to turn it, said mechanism comprising a rod 72 secured at one end to the slotted end of the crank 65 through the medium of a clevis 73 and carrying at its other end a fork 74 provided with a cam roll 75 cooperative with a cam 76 disposed on shaft 51 and rotatable therewith. Within the opening of the fork 74 is disposed a block 77 loosely mounted on the shaft 51, the function of the block being merely to afford vertical support to the fork while permitting it to slide horizontally to and fro in accordance with the movements of the cam toward which the cam roll 75 is constantly urged by the spring 70 to thus cause the roll to follow the cam save when the crank 65 and slide 61 are held in retracted or locked position as shown in Fig. 1 by means and for a purpose hereinafter described.

The stripper 60 is arranged to rest against and slide along the outer face of the guide plate 10 and to this end the stripper is provided with a block-like base 79 which may be suitably offset toward the guide plate. This base comprises a recess for the reception of the end of the slide and the parts are secured together by a vertically extending pivot pin 80 in such manner that the base and stripper may oscillate together about the pin. To insure the leading end or toe of the stripper being continuously pressed toward the guide plate, the base may be provided with an arm 81 extending parallel to the slide and in the opposite direction from the base to that in which the stripper extends, and a coil spring 82 is positioned between the end of the arm and the slide. Furthermore, to enable the toe of the stripper to strip the leading article A from the magazine and then carry it toward the discharge end of the machine, the toe of the stripper is made very thin and slightly outwardly offset from the face of the guide plate, thus providing a recess 83 in which the article is received after it is stripped from the pack in the magazine and then carried along with the stripper until the shoulder at the end of the recess clears the end of the guide plate 10 and the article is thus brought to a position to be applied to the end of the can. To insure the pressing of the article against the end of the can under these conditions a flexible inwardly curved flat spring 84 is secured to the side of the magazine with its free end extending into the path of the can, the stripper being provided with a slot 85 in alignment with the spring and of sufficient width to allow the spring to pass therethrough when the stripper is brought to alignment therewith.

Cap supplying, feeding and holding means.

The caps to be applied to the cans are delivered to the machine through the medium of a downwardly curved conveyor or track generally designated as 86 and comprising inwardly overhanging oppositely disposed spaced side rails 87 and, preferably, a bottom 88 so arranged that the caps X will freely pass along the conveyor by gravity, the lower end of the conveyor which overhangs the table, and which is substantially the only part thereof shown in the drawings, extending vertically. The passage of the caps through the conveyor is controlled by a dog 89 mounted on a shaft 90 extending across the face of the conveyor and of such character that when it is in normal position a toe 89′ provided at the lower end of the dog will engage beneath the rim of the lowest or leading cap and support it vertically so as to prevent it from falling into the general plane in which the cans are traveling through the machine. The shaft 90 also carries an arm 91 which is operative when raised by mechanism hereinafter described to rotate the shaft and thus withdraw the toe 89′ from beneath the rim of the cap so as to let the latter fall into the plane of the cans.

When so released the leading cap, designated as X^1, is received in the cap holding means now to be described and which are best illustrated in Figs. 3 to 5 inclusive, said means comprising a shoe 100 pivoted adjacent one end, on a vertical pivot 101 secured to the table, so as to swing horizontally, the opposite or free end of the shoe being arranged to normally project somewhat into the path of the cans in a slightly angularly inwardly inclined direction with respect thereto as shown in Fig. 3. To a suitably disposed lug on the back of this end of the shoe is pivotally secured, as by a pivot 102, a head 103 carrying a push rod 104 which is surrounded by a coil spring 105 disposed between the head and a stop plate 106 secured to the table and through which the rod loosely extends, the outer end of the rod being threaded and provided with adjustable nuts 107 adapted to abut against the stop plate and so limit the inward movement of the shoe under the influence of the spring which is always under more or less compression. Thus, the shoe is capable of being swung out around its pivot as shown in Figs. 4 and 5 during the passage of a can across its inner face 100′, thereby compressing the spring 105 between the head 103 and the stop while, as soon as the pressure on the face of the shoe is relieved, the spring is effective to immediately return the shoe to normal position as shown in Fig. 3.

The shoe is provided with means for receiving and holding the caps as they are consecutively released from the cap conveyor, said means comprising a stationary dog 110 secured to that end of the shoe adjacent the pivot 101 and having an inwardly overhanging toe 110′ and a movable dog 111 which is pivoted to a lug 112 on the back of the shoe and extends through a slot 113 formed in the latter, the extremity of this dog which projects beyond the face 100′ of the shoe being also provided with an inwardly turned toe 111′, the two dogs and their respective toes when in normal position as shown in Fig. 3 being adapted to receive a cap when dropped vertically between them and to hold it in upright position against the shoe as illustrated in said figure (in which the cap X^1 is shown in central horizontal section) by engagement of their respective toes over the edge of the cap rim substantially at opposite ends of the horizontal diameter of the cap. The dog 111 is extended rearwardly somewhat beyond its pivot 114 and a spring 115 connected between this part of the dog and a pin 116 or other point relatively stationary with respect to the shoe in such manner that the spring will constantly tend to pull the dog to normal position so as to dispose it to receive and hold a cap. An adjusting screw 117 may be arranged on the shoe in such manner that its point will contact with the dog to adjustably limit the distance through which the dog can be turned inwardly by the spring 115; by means of this screw a very exact adjustment of the normal position of the dog can be obtained and the dog thus properly disposed to receive and hold the caps.

It will of course be understood that the lower end of the cap conveyor 86 is disposed above and slightly spaced from the shoe 100 so that the latter can freely swing beneath the conveyor; additionally, as the shoe when in position to receive a cap from the conveyor occupies an angular position with respect to the path of the cans, the lower end of the conveyor is also correspondingly angularly disposed so that the caps when released from the conveyor will readily pass to and be received by the subjacent dogs 110 and 111 of the cap holding means and will then occupy a position in which the body or central part of the cap forms an angle of about 30° with the path of travel of the cans. This angle, however, is capable of considerable variation although good results are obtained when it approximates the number of degrees stated.

Cap seating means.

For finally pressing or seating the caps on the cans after they have been disposed over the ends thereof as hereinafter described, I provide the complementary presser wheels 13 and 17 between the shoe 100 and the discharge end of the table, these wheels being

respectively disposed on opposite sides of the path of travel of the cans and adjustably arranged to extend slightly thereinto. Wheel 13 is mounted on a short vertically extending shaft 120 for horizontal rotation and has a plane face of approximately the diameter of the cans, and the opposite wheel 17 is preferably similar thereto and similarly mounted on a corresponding shaft 121. Shaft 120 below the wheel is journaled in a block 122 slidable transversely of the table in a slot 123, the block having an overhanging flange on each side which engages the surface of the table so as to afford vertical support to the block. At the lower end of the shaft beneath the block a bevel gear 124 is secured to the shaft and cooperates with a complementary gear 125 mounted on shaft 46 and rotatable therewith but longitudinally slidable thereon, the connection between this gear and the shaft being effected by key 126. The hub of gear 125 is provided with an annular groove 127 into which depends a yoke 128 conveniently formed integral with block 122 so that as the block is moved in the slot, gear 125 will be correspondingly moved along its shaft and the proper engagement maintained between the two gears 124 and 125 so that rotation of shaft 120 and wheel 113 will be effected irrespective of the position of block 122. For yieldingly urging the block and wheel inwardly toward the path of the cans a relatively heavy coil spring 129 is disposed between the block and the outer end of the slot; when a can enters between the wheels this spring is compressed to permit wheel 13 to move outwardly and allow the can to pass.

The mounting and drive of the other presser wheel 17 is effected in a substantially similar manner, the shaft 121 being journaled in a block 130 slidable in a transversely extending slot 131 and having a preferably integral depending yoke 132 cooperative with a groove 133 in the hub of a bevel gear 134 keyed to shaft 46 by a key 135 so as to rotate therewith although slidable thereon, this gear being in meshing engagement with a complementary gear 136 disposed on the lower end of the shaft 121. Instead, however, of providing a spring for urging the block inwardly, I preferably extend an adjustable stop screw 137 through the frame to abut against the block and limit its outward movement, conveniently I provide the screw with a groove near its end and the block with a depending yoke 138 cooperative therewith so that movement of the screw in either direction will effect a corresponding movement of the block.

It will thus be apparent that both of the presser wheels are constantly and positively driven in opposite directions as indicated by the arrows in Fig. 2 whenever power is supplied to motor 56 in such manner that as the cans are moved between the wheels the latter will exert a yielding endwise pressure on the cans so as to seat the caps firmly on the ends of the cans, and furthermore that the space between the wheels may be increased or decreased by suitable adjustment of the stop screw 137 so as to vary the pressure so exerted as may be found desirable under different conditions of operation. As the cans finally pass from between the wheels they are carried over the end of the table by their respective conveyor dogs and may there be received on a suitable track T and thereby conveyed to any convenient point for packing in boxes or other like operation, the track forming no part of the present invention and being thus merely indicated in broken lines in the drawings.

Locking and releasing mechanism for stripper and cap feeding means.

From the foregoing description of the machine it will be observed that the motion of the conveyor chain 8 is continuous so long as power is supplied to the motor 56 and irrespective of whether cans are being supplied to the machine from the conveyor 30. Under practical conditions of operation it frequently happens that for some reason there is a temporary interruption in the can supply and it is thus desirable to so arrange the article stripping means and the means by which the caps are fed or released from the cap conveyor that both of said means will remain inoperative except when a can is approaching the station at which the article is to be applied to its end and the cap thereafter positioned thereover. This obviates the possibility of articles being stripped from the article magazine and caps being fed to the cap holding means when no cans are passing through the machine, thereby avoiding possible clogging and damage to the machine as well as a waste of the articles and caps. To this end therefore mechanism is provided for maintaining the stripping means inoperative to strip an article from the magazine and the cap feeding means inoperative to release a cap from the cap conveyor until a can reaches a predetermined position in the path along which the cans are designed to travel, the can upon the attainment of such position being then itself effective to release for operation both the cap feeding and article stripping means desirably in the manner and by the mechanism now to be described.

Disposed above the path of the cans is a lever 140 which is pivoted adjacent one end on a horizontally extending stud 141 carried by a bracket 142 secured to the table of the machine and overhanging the path of the cans. At its free end, that is, the end nearest the discharge end of the machine, the

lever is provided with a downwardly depending lug carrying a roll 144 which normally depends into the path of the cans so it will be engaged by each can, as it is carried along by the conveyor, upon attainment of a predetermined position. At a suitable distance above the roll the lever is provided with a substantially horizontally extending arm or plate 145 which projects beneath the arm 91 carried by shaft 90 on which the cap releasing dog is mounted, and the arm 91 is provided with an adjustable stud 146 adapted for engagement by the plate 145 when the latter is sufficiently elevated. Thus, after a can is once moved by the can conveyor into engagement with roll 144 further movement of the can toward the discharge end of the machine is effective to raise lever 140 till it engages stud 146 and to then, through such engagement, raise arm 91 to rotate the shaft 90 and swing the cap releasing dog to a position in which the toe 89′ at its lower end is disengaged from the rim of the leading cap to permit the latter to drop to the cap holding means. Preferably the upper end of the dog is also provided with a toe 89″ which is effective when the lower end of the dog is swung outward as just described to enter beneath the upper part of the rim of the following cap and thus hold it suspended until the arm 91 is released from raised position. As soon as this occurs the upper end of the dog swings out from beneath the rim of the following cap to allow it to start to fall while the lower toe of the dog swings in so as to catch under the rim of the falling cap and arrest its motion before it entirely clears the dog, thus suspending it in position to pass to the cap holding means as soon as the lower end of the dog is again swung out of the way. For properly adjusting the height of the roll 144 with respect to the cans so the desired engagement of the roll will be effected, an adjusting screw 147 may be arranged in the bracket 142 so as to engage a lug or stop member provided on lever 140 on the opposite side of pivot 141 and thus limit the downward movement of the free end of the lever.

The locking and releasing means for the stripper mechanism may comprise a lever 150 pivotally mounted near its center on the pivot 141 and carrying at its end nearest the discharge end of the machine an upwardly extending stud 151 passing loosely through the plate 145 and provided with adjusting nuts 152 above the plate in such manner that when lever 140 is raised plate 145 will engage the nuts, preferably slightly after it engages stud 146, following which further movement of lever 140 is effective to raise the adjacent end of lever 150 and cause corresponding depression of the opposite end thereof which is provided with a slot in which is slidably disposed a block 153 carried by a locking slide 154 which is vertically slidably in a housing, generally designated as 155; this housing is bolted to the table of the machine in such position as to bring the face of the locking slide 154 adjacent the slide 61. The locking slide is provided with a lug 156 disposed beneath slide 61 and provided with an inclined upper surface adapted to engage in a notch 157 formed in the lower face of slide 61 in such manner that when the lug is so engaged in the notch, slide 61 will be positively held in retracted position as shown in Fig. 1. The locking slide 154 is provided with a pin 158 which extends through a slot 159 in the locking slide housing 155 and to which is attached one end of a spring 160, the other end of which is attached to a pin 161 carried by the housing. This spring is always in a state of tension with the result that it continuously tends to pull the locking slide vertically upward to cause lug 156 to enter notch 157 in slide 61 whenever the notch is aligned therewith so as to lock the slide, the lug at other times merely riding on the under face of slide 61 as the latter reciprocates. Under these conditions it will be obvious that when the end of lever 150 carrying stud 151 is sufficiently elevated the locking slide will be correspondingly depressed so as to disengage lug 156 from the notch 157 and permit slide 61 to move from retracted position, and thus correspondingly move the stripper across the end of magazine 11.

Operation.

While it is believed the operation of the machine, when constructed substantially as described, will be readily comprehended from the foregoing, for convenience brief reference may now be made thereto as follows:

Preferably before the machine is set in operation one or more of the filled cans with their tops or lids L permanently secured in place, conveniently by crimping the edge of each lid over the open end of the can body as shown in Fig. 6, are placed in the conveyor 30; if desired and as is usual the tops of the cans may, as shown in said figure, be provided with a plurality of perforations P temporarily closed by a label Y pasted over the major part of the lid. Also, a number of the sheets of directions A which are to be stuffed beneath the can caps having been suitably folded to proper size preferably by means of a suitable folding machine, are inserted in the magazine 11 in such a way that the smooth edges or folds made along the lines where each sheet is doubled over on itself are disposed uppermost and also toward the side of the magazine adjacent the stripper; thus each folded sheet presents but a single edge or fold toward the stripper

in consequence of which the nose of the latter can readily strip off the leading sheet from the pack in the magazine which might not be the case if the sheets were so disposed in the magazine that each presented a number of separate edges or folds to the stripper so the latter might enter the interior of the folded sheet instead of merely separating it as a whole from the adjacent and following sheet. Moreover, the single fold or edge presented to the stripper when the sheets are disposed as just described is readily engageable by the shoulder formed at the base of the stripper toe, thus enabling the stripper to positively carry the folded sheet to the point where it is to be applied to the can as shown in Fig. 3. A supply of can caps is also placed in the conveyor 86, each cap being of course turned so that its rim is directed toward the front of the conveyor.

In Figs. 1 and 2 five cans designated as C^1, C^2, C^3, C^4 and C^5 are shown as simultaneously and consecutively passing through the machine from the conveyor 30 to the point at which the cans are discharged at the opposite end of the table, this being the normal condition when the machine is in operation and cans are being continuously supplied from the conveyor 30. However, to facilitate description of the operation of the machine, it will be more convenient to merely trace the passage of the can C^1 alone through the machine without detailed reference to the other cans shown in advance of it in said figures and to thus assume that the can C^1 consecutively occupies the positions of the cans C^2, C^3, C^4 and C^5 as it passes along the rails 7, 7'.

Power being now supplied to the machine to set in motion the conveyor chain and other parts driven from the motor 56, the stripper slide 61 being locked in retracted position and a cap X^1 being suspended in the conveyor on the toe 89' of the dog 89 with a supply of other caps X in rear thereof, we will assume that the can C^1 has moved by gravity from the conveyor 30 and is resting on the rails 7, 7' beneath the gate 35 as shown in said figure, the other following cans C in the conveyor being restrained from movement by engagement of the leading can C with C^1. It will be noted that under these conditions one of the dogs 9 carried by the conveyor chain is moving toward C^1 and as soon as the latter is engaged by this dog its positive movement along the rails and through the machine is initiated. The first result of this movement is to lift the gate 35 so as to allow C^1 to escape from beneath it and as soon as this occurs the following can C can pass down onto the rails in position to be engaged in due course by the next dog on the chain and by it be carried through the machine.

As it is urged ahead by the dog which has engaged it, can C^1 now passes along the rails as indicated at C^2 until it reaches the position C^3 at which it comes into contact with roll 144 to thereby raise, during its further movement, lever 140 which, in the manner hitherto described, first moves dog 89 so as to release cap X^1 and permit it to fall into the cap holding means between dogs 110 and 111 as shown in Fig. 3. The further upward movement of the lever 140 induced by the further lifting of roll 144 by the moving can then operates to depress the slotted end of lever 150, thus releasing slide 61 which, under the influence of spring 70 on crank 65, moves stripper 60 across the end of the magazine 11 to strip the leading folded sheet or other article A from the pack in the magazine and carry it to a position substantially in front of cap X^1 now seated in the cap holding means. Meanwhile can C^1 has also been moving toward the cap and arrives substantially in the position shown in Fig. 3 in time to meet the sheet of directions as the latter is pressed inwardly toward the end of the can by the spring 84 working through the slot in the stripper and thereby applied to the end of the can and held by the spring in position thereon. It will be noted that when the several parts are in substantially the positions shown in Fig. 3, the leading edge or corner of the can is just coming into engagement with the cap substantially in the angle formed between the main portion and the flange or rim of the latter, and as the movement of the can continues from this position, the shoe 100 is gradually swung about its pivot 101 out of the way of the can and the dog 111 similarly swung about its pivot 114 against the tension of spring 115, the dog thus having a relative movement with respect to the shoe while the latter is swinging about its own pivot. As the result of these several combined movements including that of the can, the cap is gradually swung into alignment with the can, the relative position of the parts when the cap is approaching that condition being shown in Fig. 4 in which it will be noted that spring 84 is just on the point of passing out from under the cap as the latter is approaching full registry with the can and thus becoming operative to hold the sheet of directions or other article in place on the end of the can and prevent it from falling out or being otherwise displaced after it is finally released by the spring.

As the can moves still further along its path of travel, the cap is progressively pressed still further into place on the can by shoe 100 under the influence of spring 105 which exerts a considerable pressure on the shoe and in turn on the cap, so that as the can and cap finally clear the shoe after passing through the position shown in Fig. 5, the cap is fully and properly aligned and

registered with the end of the can and pressed thereon sufficiently to adhere thereto. The position of the can at C^4 in Fig. 1 substantially corresponds with that shown in Fig. 5.

Upon leaving the shoe, the can next passes between the presser wheels 13 and 17 which, through the powerful endwise yielding pressure which they are capable of exerting upon the can and cap force the latter down over the end of the can into final position as shown in Fig. 6 so that the cap will thereafter frictionally adhere to the can until intentionally removed therefrom. After the can, with its cap thus firmly disposed in position, passes from between the presser wheels it is carried by the conveyor dog sufficiently far to clear the table of the machine and pass to the inclined track T or othed device intended to receive it and by which it is conveyed to the packing room for packing and shipment.

It will of course be appreciated that at all times during the operation of the machine the shaft 51 is rotating and with it the cam 76. This cam is so designed and set with relation to the operation of the stripper that after the latter has brought the folded sheet from the magazine to the point where it is to be applied to the can and has held it there until the spring 84 becomes operative to in turn hold it on the can, the cam will then engage the cam roll 75 and force crank 65 to retracted position, thus returning the stripper to its normal or initial position as shown in Fig. 1. The moment slide 61 is retracted in the manner just explained, the lug on the locking slide 154 becomes operative through engagement with the notch in slide 61 to lock the latter in such retracted position and hold it there until the locking slide is again released by the passage of a can beneath the roll 144. It will thus be apparent that even though the motor 56 be operating to drive the conveyor chain and shaft 51, with consequent rotation of cam 76, the stripper mechanism is restrained from operative movement unless it is released by the passage of a can beneath roll 144 so that said mechanism is ineffective to remove any articles from magazine 11 save when a can is approaching to receive them. In like manner dog 89 can only operate to permit a cap to fall to the cap holding means when said dog is actuated by the passage of a can beneath roll 144. In consequence, should any interruption occur in the supply of cans to the conveyor 30 or should one or more of the conveyor dogs fail to pick up a can and carry it through the machine, no articles are supplied from the magazine or caps fed to the cap holding means until the flow of cans is again established beneath the roll 144, thus avoiding any waste of articles and caps and also possible clogging or damage to the machine which might otherwise occur if the stripping means and cap feeding means were so designed that they would operate synchronously with the movement of the several dogs irrespective of whether each dog was or was not carrying a can through the machine.

In passing it may be noted that the provision of the hand wheel 55 on shaft 54 is of utility in enabling proper adjustment of the various parts of the machine when required, as by means of it the machine may be slowly turned over by hand so that the operation of the various elements can be more readily noted and a more perfect and accurate adjustment of them brought about than could conveniently be effected when the machine is running at normal speed under the influence of motor 56.

While I have herein described and illustrated with considerable particularity a preferred embodiment of my invention adapted for stuffing folded sheets or other articles against the ends of sealed cans and then applying flanged caps thereover, I do not thereby desire or intend to limit myself to the employment of the invention solely for that purpose as the invention may be readily adapted for the performance of analogous operations on other articles of a more or less similar nature and such adaptation and employment is entirely within the scope and contemplation of the invention; nor do I desire or intend to confine myself in any manner to any precise arrangement of parts or specific forms of means for accomplishing the objects and functions of the invention as any suitable means other than those to which I have referred may be utilized therefor if desired without departing from the spirit and scope of the invention as defined in the appended claims.

Having thus described my invention, I claim and desire to protect by Letters Patent of the United States:

1. A machine for stuffing and capping cans comprising means for conveying a can in a predetermined path, means for holding the articles to be stuffed, means operative to remove one of said articles from said holding means and convey it to the end of the can, means adapted to hold a cap in a position to partially project into the path of travel of the can, means for feeding a cap to said cap positioning means, and means for pressing said cap onto the can and over said article after the movement of the can has cleared said cap from the cap holding means.

2. A machine as specified in claim 1 in which the can is operative on arrival at a predetermined point in its path of travel to release for actuation the means operative to remove from said article holding means and

convey to the end of the can the article to be stuffed.

3. A machine as specified in claim 1 in which the can is operative on arrival at a predetermined point in its path of travel to actuate the means for feeding the cap to the cap positioning means.

4. A machine as specified in claim 1 in which the can is operative on arrival at a predetermined point in its path of travel to release for actuation the means operative to remove and convey from said article holding means the article to be stuffed and also substantially simultaneously therewith to actuate the means for feeding the cap to the cap positioning means.

5. A machine for stuffing and capping cans comprising means for conveying the cans consecutively at spaced intervals in a predetermined path, means for holding the articles to be stuffed substantially parallel to the ends of the cans, means operative to convey one of said articles from said holding means to the end of each can as each can reaches a predetermined station, and means for positioning a cap adjacent and partially within the path of travel of each can at a point beyond said station whereby said cap will be engaged by the can after it has received said article and thereafter released from said positioning means by the continued movement of the can.

6. A machine as specified in claim 5 having means preventing said article conveying means for removing an article from said holder until a can is brought to a predetermined position by said can conveying means.

7. A machine as specified in claim 5 having means for feeding a cap to said cap positioning means and means for maintaining said cap feeding means inoperative to feed the cap until a can is brought to a predetermined position by said can conveying means.

8. A machine for stuffing and capping cans comprising means for conveying the cans consecutively at spaced intervals in a predetermined path, means for holding the articles to be stuffed substantially parallel to the ends of the cans, means operative to convey one of said articles from said holding means to the end of each can as each can reaches a predetermined station, means for positioning a cap adjacent and partially within the path of travel of each can at a point beyond said station whereby said cap will be engaged by the can after it has received said article and thereafter released from said positioning means by the continued movement of the can, and means for pressing the cap onto the can after it is so released.

9. A machine for stuffing and capping cans comprising a conveyor adapted to positively move the cans consecutively at spaced intervals along a predetermined path, a magazine for holding a plurality of the articles to be stuffed with the leading article in substantial parallelism to the end of the cans, means actuated by each can as it reaches a predetermined station in its path of travel operative to remove the leading article from said magazine and carry it in the direction in which the can is moving, means for pressing said article against the end of the can when it reaches a predetermined point, a cap conveyor, means for consecutively releasing caps from said conveyor, means actuated by each can when it reaches a predetermined point in its travel for operating said releasing means to release a cap, means for receiving the cap from the conveyor and holding it partially in the path of movement of the can and at an angle thereto whereby the can after engaging the cap is operative to swing the cap into registry with the end of the can and effect the release of the cap from the cap holding means.

10. A machine as specified in claim 9 in which the can during its movement is operative to first actuate the cap releasing means and to then actuate in predetermined timed relation therewith the means for removing the article from the article magazine.

11. A machine of the class described, comprising a conveyor adapted to move a can in a predetermined path, a magazine arranged adjacent said path and adapted to contain articles to be applied to the end of the can, a movable stripper adapted to strip an article from the magazine and move it to a point adjacent the end of the can while the can is being moved by the conveyor, means for positioning a can cap in position to be engaged and carried along by the can after said article has been applied to the end thereof, said means being adapted to release the cap after it has registered with the can, and means for pressing the cap onto the can after said registry has been effected.

12. A machine as specified in claim 11 in which said stripper is arranged for reciprocation past the end of the magazine and embodying means operative to hold the stripper in a predetermined position until a can is brought by the conveyor to a predetermined station in the path of travel of the cans.

13. A machine as specified in claim 11 in which said cap positioning means comprise a shoe arranged to swing horizontally and normally arranged to angularly project into the path of the can, and means carried by said shoe and relatively movable with respect thereto adapted to receive and hold a can cap in position to be engaged by the moving can.

14. A machine as specified in claim 11 in

which the cap positioning means comprise a shoe pivoted for movement into and out of the path of the cans, yielding means normally operative to maintain said shoe in said path, and means carried by the shoe adapted to receive and hold a cap in vertical position and partially projecting into said path when the shoe is in normal position and comprising a dog relatively movable with respect to the shoe and yielding means for normally holding the dog in a predetermined position with respect to the shoe.

15. A machine as specified in claim 11 in which said cap positioning means comprise a shoe pivoted to swing horizontally from a position in which the face of the shoe projects angularly into the path of the can to a position in which said face is substantially parallel with but clear of said path, yielding means normally operative to maintain said shoe in said path and means carried by the shoe for receiving and holding a can cap in position to be engaged by a can as it moves longitudinally of the shoe along said path, said shoe being adapted to gradually swing out of the path of the can after the latter has engaged the cap and to press said cap onto the end of the can during said swinging movement, said cap holding means being also adapted to release the cap during the swinging movement of the shoe.

16. A machine as specified in claim 11 in which the means for pressing the cap onto the can after the cap has been registered therewith comprise a pair of wheels respectively disposed on opposite sides of the path of the can and adapted to project slightly thereinto, means for positively driving both of said wheels in opposite directions, means for positively positioning one of said wheels with respect to the path of the can, and yielding means operative to permit the other of said wheels to move transversely of said path as a can is carried between them.

17. A machine of the class described, comprising a conveyor adapted to move a can in a predetermined horizontal path, a magazine arranged adjacent said path and adapted to contain articles to be consecutively applied to the cans as they are carried consecutively through the machine by the conveyor, a reciprocatory stripper adapted to strip one of said articles from the magazine and move it to a point adjacent the end of each can as the latter reaches a predetermined point in its path of movement, spring actuated means operative to move the stripper in the opposite direction, and means for locking said stripper in opposition to the urge of said yielding means until a can is brought to the conveyor to a predetermined position in the path of travel of the cans.

18. A machine as specified in claim 17 and comprising means interposed in the path of the cans operative when actuated by the movement of a can to release said stripper locking means.

19. The method of stuffing and capping cans which comprises the steps of moving the can in a straight predetermined path, applying an article to the end of the can, then causing the can while the article is held in place against the end thereof to move into engagement with a flanged cap while the latter is maintained in angular relation with the axis of the can to thereby cause the corner of the can adjacent the point of connection of the lid and the body thereof to engage the cap substantially in the angle formed between the body of the cap and its flange and then causing further movement of the can to thereby swing the lid into registry with the end of the can over the article disposed against the end thereof.

20. The method of stuffing and capping cans which comprises the steps of moving the can horizontally in a straight predetermined path, applying an article to the end of the can without arresting its movement, and then causing the can while said article is held in place against the end thereof to move into engagement with a flanged cap while the latter is held in vertical position in angular relation to the path of movement of the can to thereby cause the corner of the can adjacent the point of connection between the end and body thereof to engage the cap substantially in the angle formed between the body of the cap and its flange whereby the continued movement of the can is effective to swing the cap from said angular position into registry with the end of the can.

21. The method of stuffing and capping cans which comprises the steps of moving the can horizontally in a straight predetermined path, applying an article to the end of the can without arresting its movement, then causing the can while said article is held in place against the end thereof to move into engagement with a flanged cap while the latter is held in vertical position in angular relation to the path of movement of the can to thereby cause the corner of the can adjacent the point of connection between the end and body thereof to engage the cap substantially in the angle formed between the body of the cap and its flange whereby the continued movement of the can is effective to swing the cap from said angular position into registry with the end of the can, and then pressing the cap into place on the end of the can by applying pressure to the can in an endwise direction.

22. The method of stuffing and capping cans which comprises the steps of consecutively moving the cans at spaced intervals in a horizontal direction along a predeter-

mined path, applying to the end of each can as it reaches a predetermined station one of the articles to be stuffed, then, while holding said article against the end of the can, causing the latter to enter a flanged cap while the cap is held in a position to partially extend into the path of the can to cause the moving can to swing the cap into registry with the end of the can, and then exerting pressure on the cap to seat it on the end of the can over said article.

23. The method of stuffing and capping cans which comprises the steps of effecting progressive continuous movement of the can along a predetermined path, applying an article to the end of the can upon its arrival at a given point in said path, then, while holding the article against the end of the can, causing the can to engage a flanged cap disposed in angular relation with the path of the can and partially projecting thereinto in such manner that the further movement of the can will move said cap into registry with the end of the can and over said article, and then applying endwise pressure to the cap to seat it on the end of the can.

24. The method of stuffing and capping cans which comprises the steps of effecting progressive uninterrupted movement of the cans at spaced intervals along a predetermined path, moving an article against the end of each can when it reaches a predetermined point in such path, consecutively disposing flanged caps in position to partially project into said path for respective engagement by each can after the application of said article thereto, and then applying pressure to each cap to seat it on the end of the can.

In witness whereof, I have hereunto set my hand this 26th day of May, 1927.

MARTIN E. BRIGHAM.