

July 6, 1948.

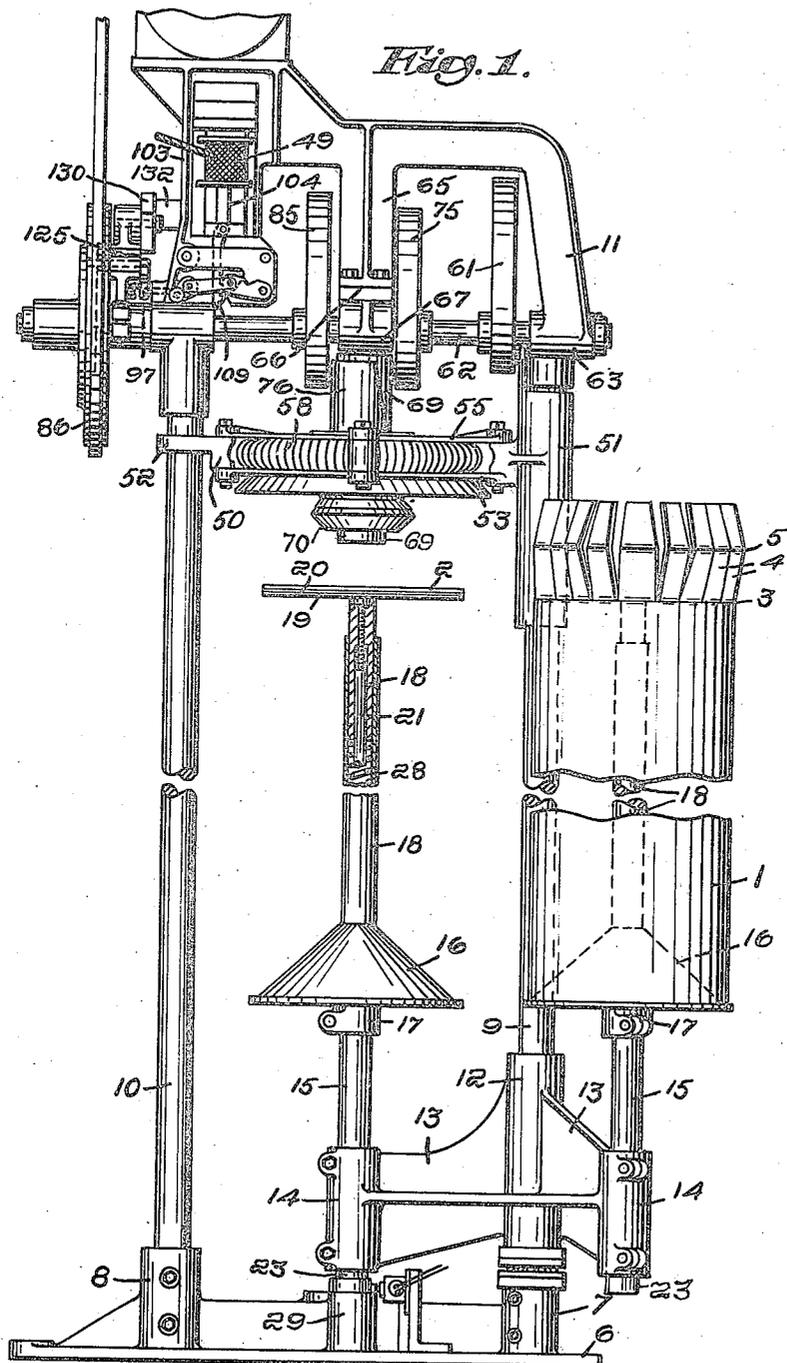
L. E. LA BOMBARD

2,444,515

CARTON ASSEMBLING MACHINE

Filed Dec. 23, 1944

7 Sheets-Sheet 1



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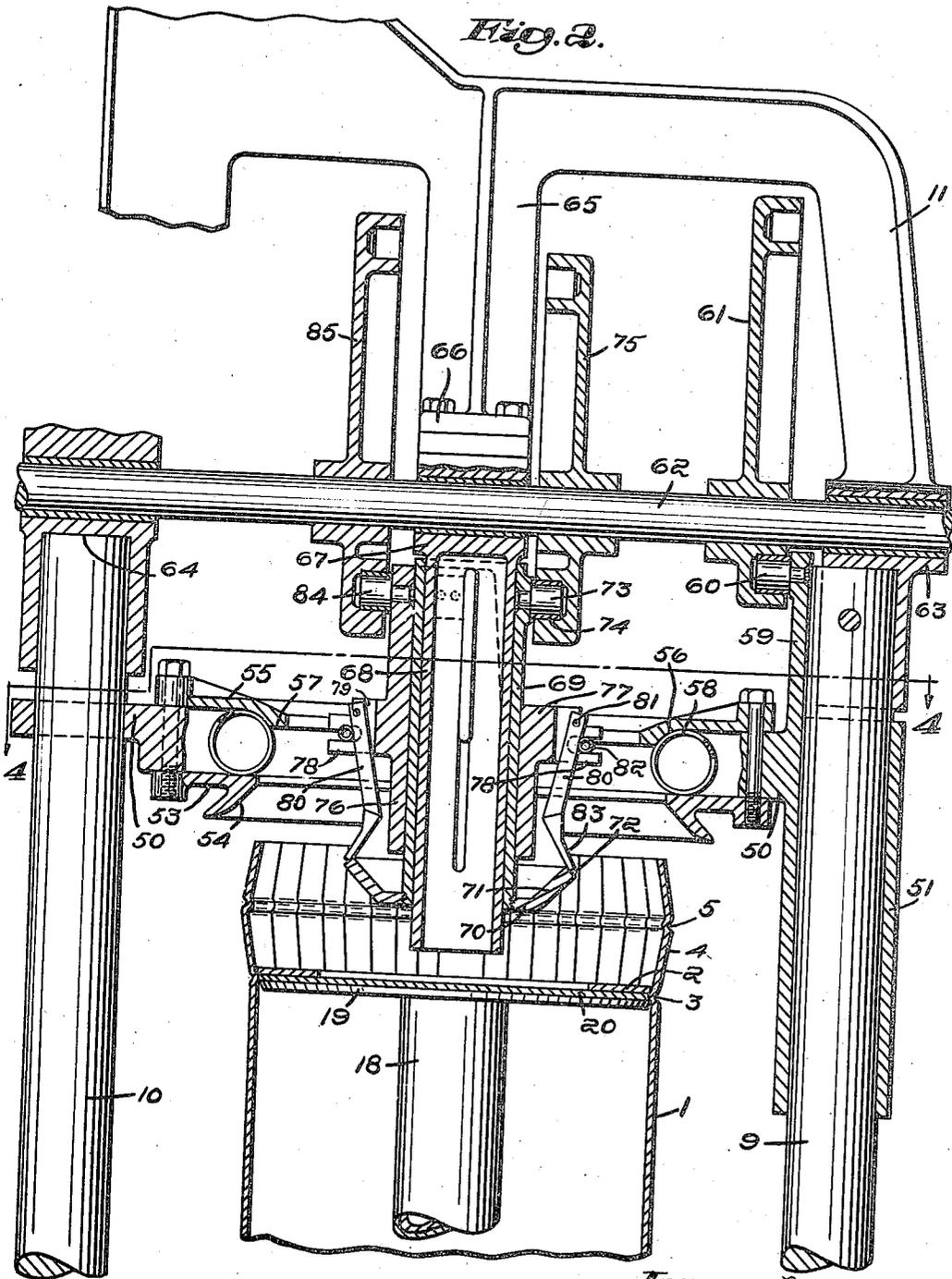
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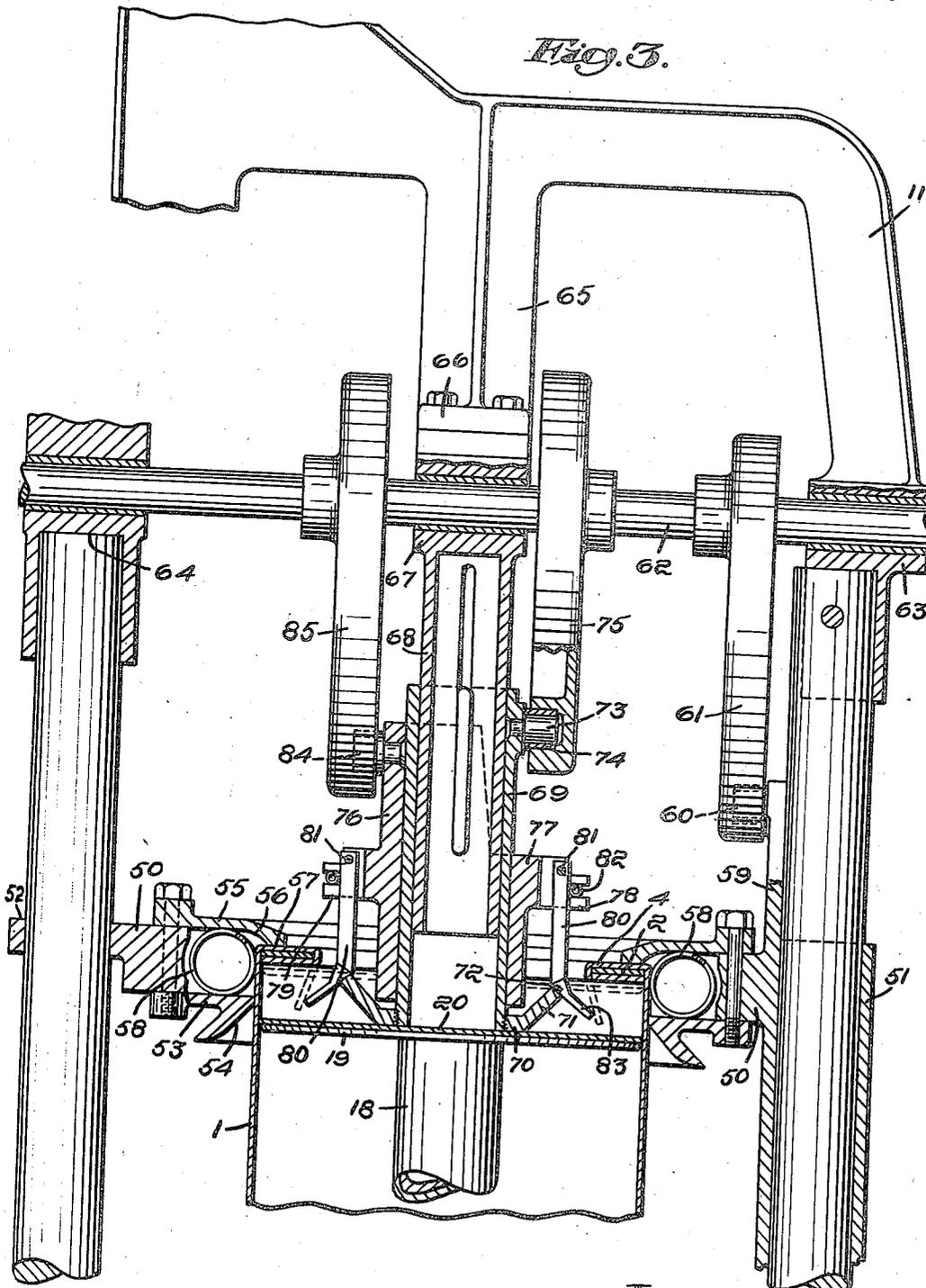
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7 Sheets-Sheet 3



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Fig. 4.

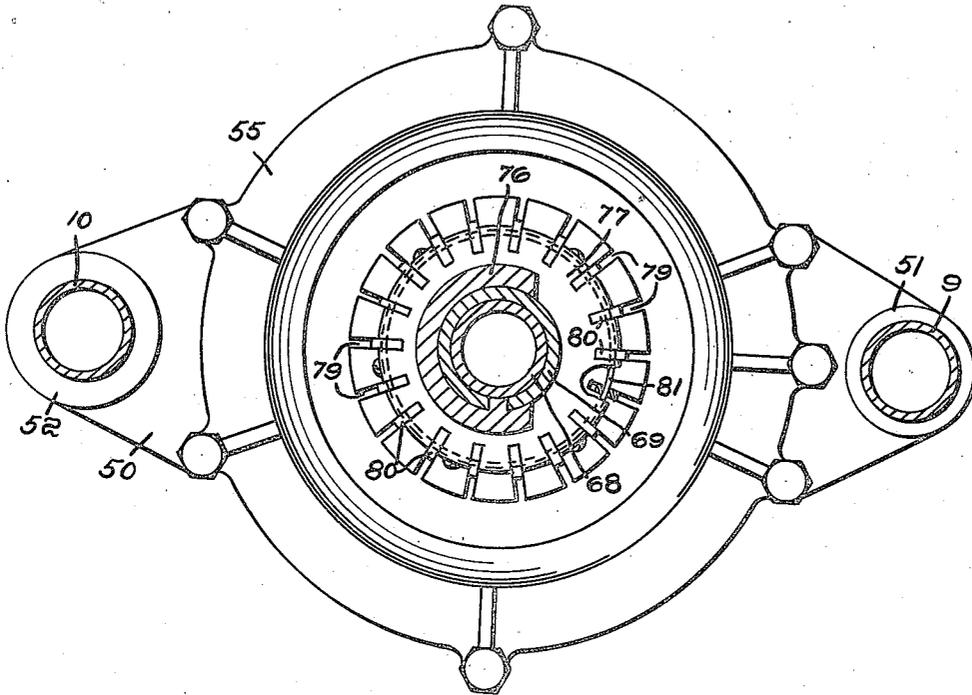
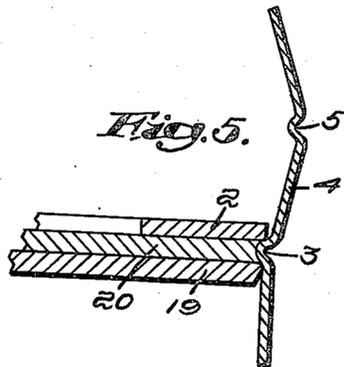


Fig. 5.



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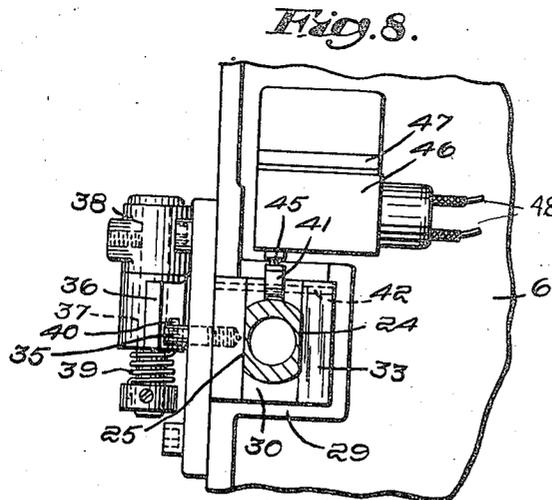
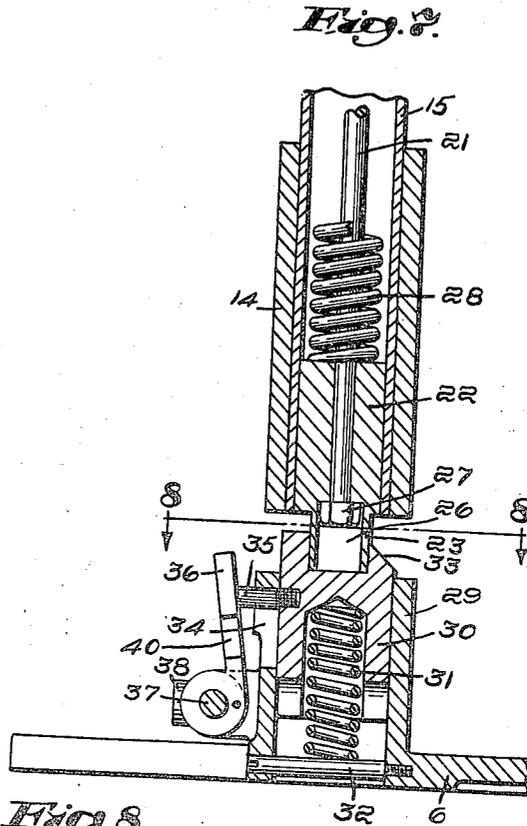
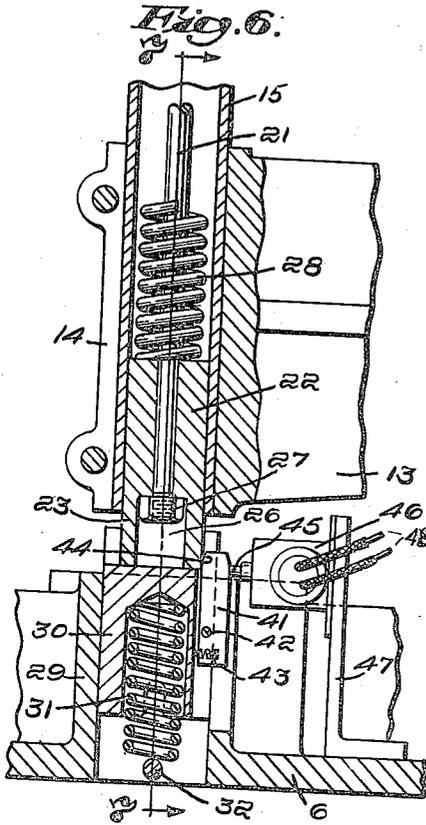
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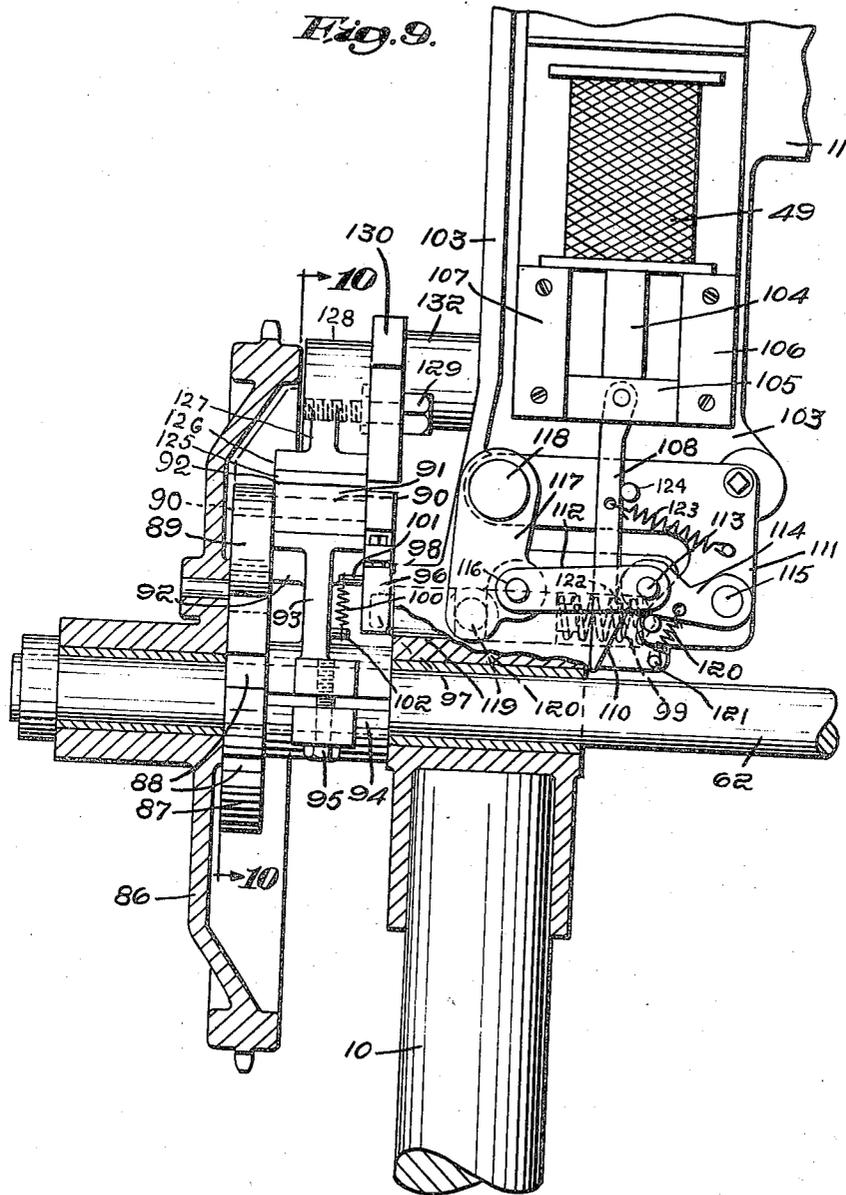
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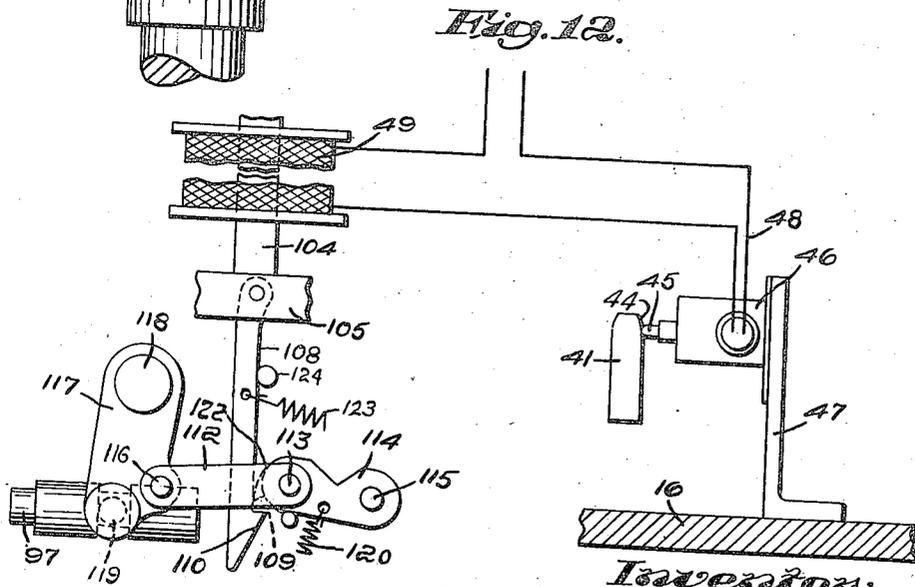
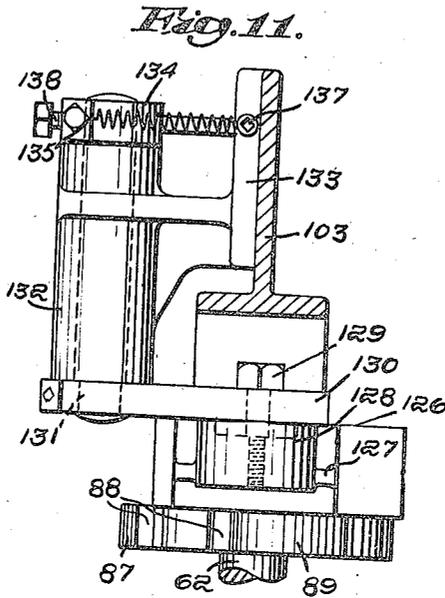
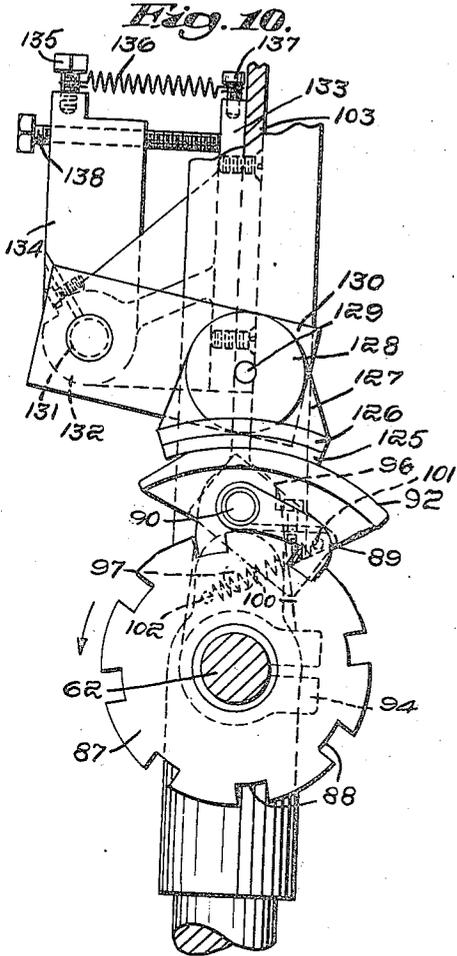
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UNITED STATES PATENT OFFICE

2,444,515

CARTON ASSEMBLING MACHINE

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Application December 23, 1944, Serial No. 569,530

24 Claims. (Cl. 93—55.1)

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This invention relates to machines for assembling a closure member forming a bottom in one end of a tubular body to form a carton, such as a container for ice cream, in which the tubular body has at one end an extension formed by slitting or notching said end and a locking ring around which the extensions are folded and a closure disk fitting the body clamping the ends of the extensions between it and the locking ring, thereby forming a tight joint which will not require the use of an adhesive or other fastening means.

Usually such containers or cartons are shipped or stored in knockdown condition, the tubular body being collapsed and it and the locking ring and closure packaged in flat condition and assembled at the place where they are to be used.

Heretofore the assemblage of the closure members on cartons of this character has been performed manually by folding the extensions inwardly around the ring and then forcing the closure member against the intumed end portions of the extensions and clamping them between the closure member and the ring. In some instances a manually operable jig has been employed to aid in folding the extensions around the ring and clamping the closure member upon them. In either case considerable time is required to accomplish the purpose, and satisfactory results have not been obtained. The object of the present invention is to provide rapidly operated automatic mechanism for assembling closures upon carton bodies of this character.

The principal object of the present invention is to provide a machine which will readily assemble such cartons automatically and insure uniform and satisfactory locking of the closure member within the carton body.

More specifically the objects of the invention are to provide means for rigidly supporting the carton body with a locking ring held at the base of the extensions and providing yieldable means within the body for supporting the closure member in combination with reciprocating forming mechanism having means for first bending the extensions inwardly, thereupon spacing the closure member from the locking ring, folding the extensions around the ring, and thereafter clamping the infolded ends of the extensions between the locking ring and the closure member.

Another object of the invention is to provide a machine having a plurality of circularly arranged members for supporting the carton body and the closure movable respectively into axial alignment with the reciprocating forming mechanism aforesaid.

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Another object of the invention is to provide means operable by a single rotation of the driving shaft for reciprocating the members of the forming mechanism in proper sequence to effect the assemblage of the closure member and body as aforesaid.

Another object of the invention is to provide means for insuring a single rotation of the driving shaft.

Another object of the invention is to provide mechanism for automatically locking the carton-supporting mechanism in assembling position when moved into such position.

A further object of the invention is to provide a construction in which the upward movement of the carton body supporting mechanism upon completion of the assembling operation will release the locking mechanism thereby to permit another carton supporting mechanism to be moved into assembling position.

Another object of the invention is to provide means operable by the locking mechanism for automatically causing actuation of the forming mechanism and operable upon release of the locking mechanism to arrest the operation of the forming mechanism upon the completion of a single revolution of the driving shaft, thereby rendering the machine wholly automatic upon positioning of the carton supporting means in assembling position.

These and other objects and features of the invention will more fully appear from the following description and the accompanying drawings and will be particularly pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawings, in which,

Fig. 1 is a front elevation of the machine;

Fig. 2 is an enlarged detail view, mainly in vertical section, of the forming mechanism and the means for actuating the same, illustrating the forming mechanism in raised position preparatory to the inward bending of the body extension with the closure member held in proximity to the locking ring;

Fig. 3 is a similar view illustrating the position of the extension bending mechanism after the extensions have been bent inwardly and the mechanism for folding the extensions about the locking ring engaging the end portions of the extension in preparation to folding them against the under face of the locking ring;

Fig. 4 is a horizontal sectional view on broken line 4—4 Fig. 2, viewed downwardly;

Fig. 5 is an enlarged detail vertical sectional view of the end portion of the carton body and

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the extensions thereof showing the manner in which the locking ring is supported upon said body and the position of the closure member preparatory to the operation of the forming mechanism;

Fig. 6 is a detail view, mainly in vertical section, of the mechanism for locking the vertical spindle of the turret in assembling position and showing the switch mechanism for controlling an electric circuit governing the operation of the forming mechanism;

Fig. 7 is a vertical sectional view of the same on line 7—7, Fig. 6;

Fig. 8 is a sectional view on line 8—8 Fig. 7 viewed downwardly;

Fig. 9 is an enlarged front view, partially in vertical section, illustrating the electrically controlled mechanism for causing a single rotation of the driving shaft which operates the forming mechanism;

Fig. 10 is an enlarged vertical sectional view of the construction illustrated in Fig. 9 on the broken line 10—10 Fig. 9, viewed from the left toward the right;

Fig. 11 is a plan view of the construction shown in Fig. 10, the bracket for supporting the same being shown in section; and,

Fig. 12 is a detail view, mainly diagrammatic, illustrating the electrical connection between the locking mechanism for the carton-supporting means and the mechanism for actuating the forming mechanism.

The present invention relates to a machine for assembling cartons such as containers for ice cream and the like which comprises a tubular, preferably cylindrical, collapsible body of paper-board or other suitable material having one end slitted or notched longitudinally to provide a series of extensions which are foldable around a locking ring, preferably of like material, with a closure member, such as a disk, tightly fitting the body at the base of the extensions and adapted to be frictionally supported thereby or preferably by a rib indented in the body adjacent to the bases of the extensions.

As illustrated in Figs. 1 and 5 of the drawings the body 1 of the cylinder is of cylindrical form with a flat locking ring 2 supported upon an indented rib 3 at the base of the series of foldable extensions 4. The extensions desirably are provided approximately midway of their length with a weakened line 5 formed by externally indenting the extensions.

The assembling machine illustrated herein comprises a base 6 having suitably spaced integral tubular stands 7 and 8 in which are fixedly secured vertical preferably cylindrical standards 9 and 10 which are connected at their upper ends by a yoke 11 in which is mounted means for reciprocating vertically suitable forming mechanism for bending the body extensions inwardly and thereafter folding the same around the locking ring 2, as will be hereinafter more fully described.

Suitable mechanism for supporting a circular series of carton-supporting means adapted to be moved into axial alignment with the forming mechanism are provided to permit the loading of a carton upon one support while the forming mechanism is folding the extensions around the ring and clamping a closure member thereupon and the carton is adapted to be removed from another of the supporting means during said assembling operation. In the construction illustrated herein a turret 12 having three radial arms

13 is rotatably mounted preferably upon one of the standards 9. Each of the arms 13 is provided at its end with vertically split socket member 14 which is adapted to receive and be firmly clamped upon a vertical spindle 15. Means for supporting the cartons vertically are adjustably mounted upon the spindles 15. Preferably such supporting means 16 are of conoidal form having a horizontal periphery and provided with a downwardly extending split sleeve 17 which is suitably clamped upon the spindle 15 to permit adjustment of the supporting means vertically in accordance with the length of the carton body, the extensions of which are to be acted upon by the forming mechanism. A tubular leeve 18 is slidably mounted in the upper portion of the spindle 15 and has secured to its upper end a plate 19 conforming to the inner contour of and slidably fitting within the carton body and adapted to support a closure member or disk forming the bottom 20 of the carton when assembled (Fig. 1).

In the preferred construction the sleeve 18 is internally screw threaded and mounted upon the end of a screw threaded rod 21 which extends axially downwardly through the spindle and through a companion sleeve 22 (Figs. 6 and 7) which is expanded or otherwise rigidly secured in the lower end of the spindle and has an extension 23 which projects below the arm 13 of the trunnion 12 and is slabbed off (Fig. 8) to provide parallel sides 24 and 25, the extensions thus formed being adapted to engage a suitable socket in a locking plunger hereinafter to be described. The extension 23 is provided with an axial recess 26 and the rod 21 has secured to its end a nut 27 adapted to move longitudinally of the recess and to limit the upward movement of the rod 21. A heavy spiral spring 28 is interposed between the upper end of the sleeve 22 and the lower end of the sleeve 18 and serves normally to force the sleeve 18 upwardly until arrested by engagement of the nut 27 with the upper wall of the recess 26, thus yieldably supporting the plate 19 which carries the closure member 20.

The complementary locking member, which cooperates with the extension 23 of the sleeve 22, desirably is in the form of a hollow boss 29 which extends upwardly from the base 6 axially of the forming mechanism. A plunger 30 is reciprocally mounted in the boss and normally forced upwardly by a spiral spring 31, the lower end of which is seated upon a pin 32 which is mounted in the base and extends transversely of the hollow boss, as shown in Figs. 6 and 7. The upper end of the plunger 30 is provided with a socket complementary to the extension 23 of the sleeve 22 and one of the thicker sides of the wall of the socket has a beveled upper end 33 adapted when the turret is rotated to be engaged by the lower end of the spindle extension 23 and force the plunger downwardly until the extension 23 is in alignment with the socket in the plunger, whereupon the spring 31 will cause the plunger to snap into locking engagement with the extension and retain the spindle carrying the loaded carton in proper alignment with the reciprocating forming mechanism.

The forming mechanism is provided with means hereinafter described to force the closure member and the disk which carries it downwardly during the folding of the carton extensions about the locking ring. Such downward movement forces the sleeve 18 and the rod 21 downwardly so that the nut 27 engages the bottom of the socket in the plunger and forces it downwardly until the upper

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end of the plunger is below the end of the extension 23 of the sleeve 22, thus unlocking the spindle.

Suitable means are provided for locking the plunger in lowered position when thus depressed. In the present construction the boss 29 is provided with a vertical slot 34 and the plunger 30 has secured to it a pin 35 which extends through the slot 34. A lever 36, which is pivotally mounted upon the shaft 37 extending horizontally through a lateral extension 38 in the boss, is normally forced into engagement with the pin 35 by a coiled spring 39 one end of which is secured to the shaft 37 and the other end of which is secured to the lever 36, as shown in Figs. 7 and 8. The lever 36 is provided with a slot 40 so positioned as to receive the pin 35 when the plunger is depressed and lock the plunger in depressed position below the path of the extension 23 of the sleeve 22. The upper end of the lever 36 extends above the boss 29 and is adapted to be engaged by the extension 23 of the sleeve when released from the socket in the plunger, when the spindle is swung from assembling position after completion of the assembling operation, thereby enabling the next spindle of the turret, which in the meantime has been loaded with another carton, to be swung into assembling position and locked therein in the manner aforesaid.

One of the objects of the invention is to provide means for automatically initiating and continuing the action of the forming mechanism when the loaded spindle is swung into and locked in assembling position, and for arresting the actuation of the forming mechanism upon completion of the assembling operation. This is accomplished by providing the locking plunger 30 with means for actuating a switch controlling an electric current operable when the plunger is in locking engagement with the extension 23 of the spindle to complete an electric circuit which controls the mechanism for actuating the forming mechanism.

In the construction illustrated herein, Figs. 1, 6, 7 and 8, the plunger is provided with a vertical slot in which a lever 41 is mounted upon a pin 42 and normally forced toward the base of the slot by a spring 43. The upper end of the lever 41 is provided with a beveled edge 44 adapted to be engaged by the extension 23 of the spindle sleeve 22 when the plunger is raised into locking engagement with it. The opposite edge of the lever 41 is adapted to engage a rod 45 which actuates a micro switch contained in a casing 46 which is mounted upon a suitable stand 47 secured to and extending upwardly from the base 6. The micro switch is adapted to control an electric circuit 48, which is diagrammatically illustrated in Fig. 12, which leads to a solenoid 49 which controls the operation of the forming mechanism as will hereinafter be described.

The operation of the switch mechanism is as follows: When a spindle is swung to assembling position and the lower end of the extension 23 engages the beveled upper end 33 of the locking plunger 30, the plunger 30 is depressed until the extension 23 registers with the socket in the plunger but not sufficient to cause its pin 35 to enter the slot 40 in the lever 36, whereupon the plunger is snapped upwardly by the force of the spring 31. At this time the beveled edge 44 of the switch-actuating lever 41 is engaged by the extension 23 and swung outwardly, thereby forcing the rod 45 in a direction to complete the electric circuit which controls the operation of the forming mechanism and continues to maintain completion of the circuit until the plunger is

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further depressed by the rod 21 at the completion of the operation of the forming mechanism sufficiently to cause the pin 35 to enter the slot 40 in the spring actuated lever 36 thereby locking the plunger 30 in its lowermost position. When the plunger 30 is depressed by the rod 21 at the completion of the operation of the forming mechanism the beveled end 44 of the lever 41 is disengaged from the extension 23 of the spindle sleeve 22 and the spring 43 swings the lever 41 to a position which releases the switch actuating rod 45 thus enabling the micro switch to break the electric circuit which controls the operation of the forming mechanism, as hereinafter described. When the turret 12 is rotated to position the succeeding spindle 15 in alignment with the forming mechanism the lower end of the extension 23 of the sleeve 22 of the released spindle engages the end of the lever 36 and swings it sufficiently to disengage the pin 35 of the plunger 30 from the slot 40 in the lever 36, thus enabling the spring 31 to raise the plunger so that its inclined face 33 will be engaged by the sleeve extension 23 of the next succeeding spindle when it approaches axial alignment with the forming mechanism.

The forming mechanism

The forming mechanism comprises a vertically reciprocable member for bending inwardly the extensions of the carton body and having means for clamping the ends when folded about the locking ring firmly against the face of the locking ring adjacent to the closure member, and also comprises relatively movable mechanism concentric with and reciprocable relatively to the bending mechanism having means for folding the extensions closely around the locking ring preparatory to the clamping of the extensions upon the locking ring by the closure disk.

Suitable means, operated by a single revolution of the driving shaft, are provided for actuating the respective members of the forming mechanism to effect the assembling operation, and means are provided for producing a single rotation of the driving shaft which are automatically controlled by the switch mechanism which is operated by the plunger of the spindle locking mechanism heretofore described.

The mechanism for bending inwardly the upwardly projecting extensions of the carton body comprises an annular cross head 50 which has an integral sleeve or bearing 51 which slidably fits upon the vertical cylindrical standard 9 and a diametrically opposite extension 52 which slidably fits upon the vertical standard 10. An annular ring 53 is secured to the under face of the cross head 50 and is provided with a downwardly and outwardly inclined face 54 which serves as the cross head is depressed to engage and bend the extensions 4 of the carton body inwardly and to clamp the body firmly upon the periphery of the closure disk 20. The cross head 50 is also provided with an upper annular plate 55 which extends inwardly beyond the inner periphery of the ring 53 and is provided near its inner end with a downwardly curved face 56 and a flat inner under surface 57 which acts in cooperation with the support for the carton closure member to clamp the end portions of the extensions firmly between the closure member 20 and the locking ring 2. A circular cylindrically coiled spring 58, which is confined between the ring 53 and the annular plate 55, is adapted when contracted to lie against the curved portion 56 of the plate

55, and thereby to extend inwardly sufficiently to aid, upon depression of the cross head 50, in bending the extensions of the carton inwardly and enable the end portions of the extensions to be engaged by the mechanism for folding the same around the locking ring. The spring 58 also serves to constrict the body upon the periphery of the locking ring and hold it in place during the separation of the closure disk therefrom as will more fully appear hereinafter.

The vertical reciprocation of the cross head may be accomplished by any suitable mechanism. As illustrated herein the sleeve or bearing member 51 has an upwardly extending portion 59 having at its upper end a follower 60 which engages a groove in a cam 61 which is secured to a driving shaft 62 which is journaled in suitable bearings 63 and 64 in the yoke 11.

The mechanism for folding the end portions of the extension 4 of the carton around the locking ring 2 comprises a vertically reciprocable hub which is concentric with the extension bending mechanism and relatively movable mechanism for folding the inwardly bent extensions around the locking ring 2.

In the construction illustrated the yoke 11 has a central downwardly extending reinforced column 65 having a flanged lower end 66 to which is bolted a journal 67 for the driving shaft 62. The journal member 67 has an integral vertical tubular column 68 upon which a sleeve 69 is slidably mounted and has secured to its lower end a head 70 having an outwardly and upwardly inclined flange 71 provided at its end with a flat edge 72 adapted to be engaged by laterally swinging arms for bending the end portions of the carton extensions beneath and against the locking ring. The sleeve 69 is provided adjacent its upper end with a radially extending follower 73 desirably provided with a roller 74 which engages a cam groove in a cam 75 which is fixedly secured to the driving shaft 62.

The folding mechanism comprises a sleeve 76 which is slidably mounted upon the sleeve 69 and provided with an annular boss 77 having a relatively narrow annular extension 78. The extension and boss are provided with radial slots 79 which form guides for a circular series of folding arms 80 which are pivotally mounted at their upper ends upon a ring 81 which is mounted in the upper portion of the boss. A circular spiral spring 82, which is mounted in a suitable horizontal recess in the extensions of the boss, engages the outer edges of the levers 80 and tends to hold them normally in substantially vertical position. The lower end of each of the arms 80 has an integral downwardly and outwardly folding section 83 the under faces of which are adapted to engage the edge 72 of the head 71, as shown in Fig. 2, when the sleeve 76 is forced downwardly relatively to the sleeve 69 of the head 71. The upper end portion of the sleeve 76 is provided with a laterally extending follower 84 which is located diametrically opposite to the follower 73 and which engages a suitable cam groove of a cam 85 which is fixedly secured to the driving shaft 6.

The cam 61 is so constructed that upon each revolution of the driving shaft 62 the cam 61 will force the cross head 50 downwardly and thereby cause the inwardly bent face 54 of the ring 52 and the contracted spring 58 to bend the extensions of the carton inwardly over the locking ring 2 in a position to be engaged by the lateral extensions 83 of the folding arms 80.

The cam 75 is so constructed that during said revolution of the driving shaft 62 it will force the sleeve 69 downwardly and cause its head 70 to engage the closure member 20 which is supported upon the yieldable plate 19 and sleeve 18 of the spindle and force them downwardly to space the closure member a sufficient distance from the locking ring, which is held in place by the pressure of the cylindrically coiled spring 53, to permit the lateral extensions 83 of the folding arms to bend the end portions of the carton extensions outwardly. Such downward movement of the sleeve 76 causes the sections 83 of the folding arms 82 to engage the edge of the head 71 and upon further downward movement of the sleeve 76 to swing the folding arms outwardly against the resistance of the circular spring 82 until the sections 83 fold the extensions of the carton firmly against the under face of the locking ring 2, as illustrated in Fig. 3. The groove of the cam 85 is so constructed as thereupon to move the sleeve 76 upwardly relatively to the sleeve 69 of the head thereby permitting the folding arms 80 to be moved out of engagement with the edge 72 of the head 71 and to be withdrawn inwardly by the annular coiled spring 82 sufficiently to clear the locking ring 2 and the carton extensions 4 which are folded about the locking ring.

Inasmuch as the cams 61, 75, and 85, are so constructed that one revolution of the driving shaft 62 will cause them to reciprocate the respective forming elements in a sequence to fold the carton extensions around the locking ring and enable the closure member to clamp said extensions upon the ring and thereby complete the assemblage of the closure member and carton, means are provided for revolving the driving shaft 62 one revolution and arresting it at the end of such revolution.

Any suitable single revolution clutch may be employed for this purpose. However, in order to insure accuracy a special clutch and brake mechanism is employed in the present construction.

As illustrated in Fig. 1 and in detail in Figs. 9-12 the shaft 62 has rotatably mounted upon it a continuously driven sprocket wheel 86 to which is fixedly secured a disk 87 having a series of equally spaced recesses 88 provided with radial walls which are adapted to be releasably engaged by a spring-pressed pawl which is secured to the driving shaft and which upon engagement with one of the recesses 88 will couple the shaft to the sprocket wheel. Means are provided for releasing the pawl from such engagement at the end of a single revolution of the driving shaft 62 and braking means, hereinafter described, are provided for overcoming the inertia of the rotating shaft 62 and the mechanisms actuated thereby to insure proper positioning of the forming mechanism for the next assembling operation.

In the construction as illustrated in Figs. 9 and 10 the clutch pawl 89 is fixedly secured to one end of a shaft 90 which is journaled in a bearing 91 in a wide arcuate end 92 of an arm 93 having a split hub 94 which is fixedly clamped upon the driving shaft 62 by a cap screw 95. The other end of the shaft 90 has fixedly secured to it a pawl releasing arm 96, preferably in the form of a rectangular plate, which is inclined to the axis of the shaft 62 and adapted upon rotation of the shaft to engage a bolt 97 which is slidably mounted in a boss 98 extending laterally from a panel or casing which extends downwardly and preferably is integral with the

yoke 11 of the frame and which supports automatically operated bolt actuating mechanism hereinafter described. The bolt 97 desirably is of cylindrical form and has an extension of somewhat smaller diameter adapted to be extended into the path of the pawl releasing arm and is provided approximately midway of its length with a circumferential groove adapted to be engaged by means for withdrawing the bolt from the path of the latch releasing arm.

A compression spring 99, which engages the opposite end of the bolt 97, tends normally to position the bolt in the path of the pawl-releasing arm 96, and a spring 100, which is secured at one end to a stud 101 in the pawl-releasing arm 96 and at its opposite end to a stud 102 on the arm 93, tends to force the pawl into engagement with a recess 88 in the disk 87 but yields to permit withdrawal from such engagement when the pawl-releasing arm is raised by its engagement with the bolt 97 as the driving shaft 66 approaches the end of a single revolution.

Electrically operated mechanism which is automatically controlled by the microswitch of the spindle locking mechanism as heretofore described is employed for withdrawing the bolt from the path of the pawl-releasing arm 96.

The yoke 11 has a downwardly extending column 103 having at its lower end an enlarged portion including the boss 98 in which the bolt is reciprocally mounted and therebeneath a horizontal journal for the driving shaft 62 with a socket extending downwardly therefrom which engages the upper end of the standard 10.

In the preferred construction illustrated in Figs. 1 and 9-12 the solenoid 49 is mounted on the column 103 and the core 104 of the solenoid is provided at its lower end with a cross head 105 which is slidably mounted between vertical guides 106 and 107 which are secured to the column. A pawl 108, which is pivotally suspended from the cross head 105 midway of its width, is provided with a hooked lower end having a shoulder 109 and a beveled edge 110 adapted to engage and actuate a toggle-like mechanism for withdrawing the bolt 97 from the path of the pawl-releasing arm and thereby permit engagement of the pawl 89 with a notch 88 in the disk 87 and thus couple the driving shaft to the continuously rotating sprocket wheel 86.

As illustrated in Figs. 1 and 9 the toggle-like mechanism is mounted upon a plate 111 which is secured to the lower portion of the column 103 and comprises links 112 and 114 which are pivotally connected together by a pin 113. The link 114 is pivotally mounted upon a stud 115 projecting from the plate 111 and the link 112 is connected to a stud 116 on a lever 117 which is pivotally mounted upon a stud 118 projecting from the plate 111. A stud 119, which projects from the side of the lever 117, engages the groove in the locking bolt 97. A spring 120, which is connected to the link 114 and to a stud 121, tends normally to hold the toggle links 112 and 114 in substantial alignment and thereby to supplement the action of the compression spring 99 in holding the bolt 97 extended into the path of the pawl-releasing arm 96.

The link 114 is provided beyond the pivot pin 113 with a shouldered extension 122 which is adapted to be engaged by the shoulder 109 of the pawl 108 when the latter is moved upwardly by the solenoid upon completion of the electric circuit 48 (Fig. 12). When the solenoid circuit is broken the solenoid core and pawl 108 will drop by

gravity and the inclined edge will ride over the extension 122 of the link 114 and the shoulder 109 of the pawl will be positioned by the spring 123 beneath the shouldered extension 122 of the link 114 as shown in Fig. 12.

A spring 123, which is connected to the pawl 108 and to a stud on the plate 111, holds the pawl 108 in engagement with the shouldered extension 122 of the link 114 and a suitable stop 124, such as a stud projecting from the plate 111, limits the movement of the pawl 108 under the influence of the spring 123 if the bolt is drawn upwardly out of contact with the extension 122.

When the electric circuit 48 is completed through the microswitch mechanism upon rotation of the carton-supporting spindle to assembling position, as heretofore described with respect to Figs. 6-8 inclusive, the solenoid 49 is energized, thereby raising the solenoid core 104, the cross head 105, and pawl 108, thus causing the hook-shaped end of the pawl to engage the shoulder on the extension 122 of the link 114, thus breaking the toggle formed by the links 112 and 114 and withdrawing the locking stud 97 from engagement with the pawl-releasing arm 96 and permitting the pawl 89 to engage a recess in the disk 87, which is continuously rotated by the sprocket wheel 86, thereby clutching the sprocket wheel 86 to rotate the driving shaft 62.

The upward movement of the pawl 108 when thus produced by energization of the solenoid is sufficient to release the engagement of its shoulder 109 with the shouldered extension 122 of the link 114 so that the spring 99 will force the bolt 97 to extended position in the path of the pawl-releasing arm 96. At the same time the spring 120 will draw the toggle links 112 and 114 downwardly to the position illustrated in Fig. 12.

As the arm 93 approaches a complete revolution the pawl-releasing arm 96 will engage the bolt 97 and withdraw the pawl 89 from engagement with the recess 88 in the disk 87 thereby unclutching the driving shaft 62 from the sprocket wheel 86.

Inasmuch as the driving shaft 62 and the parts which are actuated thereby acquire considerable momentum during the revolution of the shaft 62 means are provided for applying a brake to the arcuate end 92 of the arm 93 as it approaches the end of a single revolution.

In the construction shown herein a suitable brake shoe 125, which is mounted upon an arcuate brake arm 126 complementary to the arcuate end 92 of the arm 93, is provided midway of its width with a web 127 which is integral with the hub 128 which is fixedly secured by a bolt 129 to an arm 130 which in turn is fixedly secured to a shaft 131 which is rotatably mounted in a lengthy bearing 132 which is integral with a bracket 133 fixedly secured to the rear side of the column 103. The opposite end of the shaft 131 has clamped upon it an upwardly extending arm 134 in the upper end of which a screw 135 is seated. The screw 135 is connected by a spring 136 to a suitable screw 137 mounted in the upper end of the bracket 133, as shown in Figs. 10 and 11. The arms 130 and 134 thus connected to the shaft 131 form a bell crank lever to which the brake 125 is connected and the tension of the spring 136 tends to force the brake shoe into engagement with the arcuate end 92 of the arm 93 which is secured to the shaft 62. An adjusting screw 138, which is mounted in the upper portion of the arm 134, abuts at its opposite end against the bracket 133 and serves to limit the

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downward movement of the brake shoe so that it cannot be forced downwardly below the position in which it engages the arcuate end 92 of the arm 93 when the arcuate end of said arm is rotated beyond the field of engagement on the brake. By proper adjustment of the limiting screw 138 a desired predetermined pressure may be applied by the brake to the arcuate end 92 of the arm 93 as the driving shaft approaches the end of a single revolution thereby overcoming the momentum of the cam shaft and the parts carried thereby and avoiding any substantial shock in arresting the rotation of the driving shaft at such position as will accurately position the forming mechanism properly for the next assembling operation.

In the operation of the device a carton 1 is mounted upon the support of a spindle of the turret next in advance of assembling position as shown in Fig. 1. The closure member 20 is placed upon the plate 19 which is positioned at the base of the extensions 4 and the locking ring 2 is superimposed upon the closure member, as illustrated in Fig. 5, in such position that it rests upon and is supported by the rib 3 (Fig. 5) or is frictionally held by engagement of the periphery of the ring 2 with the body at the base of the extensions in the absence of the rib 3. The turret is then rotated manually to place the carton-supporting spindle in assembling position. During such rotative movement the extension 23 of the sleeve 22 which projects below the turret engages the inclined surface 33 (Fig. 7) of the plunger 39 and depresses the plunger until the extension 23 comes into alinement with the socket in the plunger, whereupon the plunger spring 31 forces the plunger upwardly thereby snapping the plunger socket into engagement with the spindle extension 23, thus fixedly securing the carton in assembling position.

As the plunger thus springs upwardly the switch actuating lever 41 is engaged by the lower end of the extension 23 and is forced laterally thereby pressing the switch-actuating rod 45 in a direction to cause the micro switch to close the electric circuit 48 (Fig. 12), and energize the solenoid 49. The solenoid when thus energized draws its core 104 upwardly thus raising the pawl 108 and causing its hook-shaped end to engage the shoulder 109 on the extension of the toggle arm 114, thereby breaking the toggle and actuating the lever 117 to withdraw the locking stud 97 from engagement with the pawl releasing arm or plate 96, and permitting the pawl 89 to engage a socket 88 in the disk 89 which is continuously rotated by the sprocket wheel 86, thus connecting the arm 93, which is fixedly secured to the cam shaft 62, to the continuously rotating sprocket 86 and causing the rotation of the driving shaft 62. The cams on the driving shaft 62 are so constructed that the cam 61 first forces downwardly the cross head 50 having the mechanisms for bending the extension of the carton thereby causing the inclined face 54 of its ring to engage the extensions of the carton body and together with the circular spring 58 to bend the extensions inwardly. At the downward limit of the movement of the cross head 50 the circular spring 58 contracts the wall of the body 1 upon the periphery of the locking ring 2 thereby holding it firmly while the closure member 20 is forced downwardly sufficiently to permit the extensions to be folded around the ring.

The cams 75 and 85 respectively are so constructed as to force the sleeve 69 having the head

70 and the sleeve 76 carrying the folding arms downwardly in such timed relation as to force the closure member 20 and its yieldable support downwardly to space the closure member from the locking ring sufficiently to enable the extensions to be folded around the locking ring and thereupon to enable the folding arms 80 to wrap the extensions about the locking ring 2.

More specifically during its downward movement the head 70 engages the closure member 20 and forces it and its supporting disk and the sleeve 18 of the spindle downwardly. Downward movement of the sleeve 76 of the folding mechanism causes the beveled lower ends of the folding arms 80 to engage the inclined surface 72 of the head and to swing the folding arms 80 outwardly so that their lateral extensions 83 will wrap the extensions firmly around the inner edge of and against the under side of the locking ring 2.

As the closure 20 and its supporting plate 19 is forced downwardly by the head 70 the rod 21 which is secured to the plate 19 is forced downwardly so that the nut 27 on its lower end engages the base of the socket in the plunger 30 and forces the plunger downwardly until the pin 35 on the plunger enters the slot 40 in the locking lever 36 which is swung into locking position by the spring 39. Such downward movement of the plunger 39 releases the switch actuating lever 41 from engagement with the end of the extension 23 of the sleeve 22 in the lower end of the carton-supporting spindle and permits the spring 43, which acts upon the lever 41, to release the microswitch mechanism and thereby break the electric circuit to the solenoid and permit its core, the cross head and pawl carried thereby to drop to a position in which it will be ready again to actuate the toggle to withdraw the locking bolt 97 upon the next energization of the solenoid.

As the driving shaft 62 continues to rotate the sleeve 69, whose head 70 engages the closure member 20, is raised and the spring 28 in the spindle causes the closure supporting plate 19 and the closure carried by it to follow the head until the closure supporting member 19 presses the closure disk 20 against the inturned ends of the carton extension and firmly clamps them against the under face of the locking ring, the inward extensions 57 of the bending mechanism being at this time held firmly in position by the cam 61.

During the upward movement of the sleeve 76, produced by the cam 85, the folding arms 80 which are pivotally mounted on the sleeve 76 are swung inwardly by the cylindrical spring 82 within the aperture of the locking ring 2. Continuing upward movement of the sleeves 69 and 76 produced respectively by the cams 75 and 85 raises the head 70 and the folding arms 80 to such height as to permit a new carton body to be moved to initial position as illustrated in Fig. 1.

The cam 61 acts in suitably timed relation to the movements of the sleeves 76 and 77 to raise the cross head 50 and the mechanism carried thereby above the carton extensions to the initial position illustrated in Fig. 1 preparatory to a subsequent assembling operation.

As the rotation of the driving shaft approaches completion of one revolution the brake 125 is applied to the arcuate end of the arm 93 on the driving shaft 62 and at the same time the bolt 97 engages the under surface of the pawl-releasing arm 96, thereby raising the pawl-releasing arm and disengaging the pawl 89 from the recess 88 in the disk 87 so that the rotation of the driving

shaft 62 is accurately arrested and forming mechanisms operated thereby held in the upraised position above described.

Downward movement of the head 73 of the forming mechanism in forcing the closure member 20 and its supporting disk 19 downwardly to permit the wrapping of the carton extension about the locking ring also forces the rod 21 downwardly to cause its nut 27 to press the locking plunger 30 downwardly until its pin 35 is engaged in the slot 40 of the locking lever 36. The locking plunger 30 is held below the extensions 23 of the sleeve 22 so that the turret 12 can be rotated about the standard 9 to a position in which the assembled carton can be removed and the next loaded spindle brought into assembling position. When the turret 12 is thus rotated the sleeve extension 23 engages the end portion of the lever 36 and so rocks it as to release the locking plunger 30 so that when the next loaded carton spindle is caused to approach assembling position the locking plunger 30 will be normally positioned by the spring 31 properly to be engaged by the extension 23 of the next loaded spindle and held in assembling position in the manner heretofore described.

In the present construction the locking plunger 30 is automatically released when a carrier is moved away from assembling position. It will be noted (Fig. 7) that the upper end of the lever 36 extends a short distance above the top of the boss 29 in which the locking plunger is mounted so that when the plunger 30 is held in depressed position by engagement of the pin 35 in the slot 40 in the lever 36 the extension 23 of the spindle sleeve may pass over the boss. When the turret is rotated to move the next loaded spindle to assembling position the extension 23 of the spindle sleeve will engage the upper end portion of the lever 36, thereby rocking it about its shaft 37 against the tension of the spring 39 sufficiently to disengage the pin 35 from the slot 40 in the lever 36, thereby enabling the spring 31 to raise the locking plunger 30 to normal position preparatory to engaging the next succeeding spindle upon further rotation of the turret. During such rotation the lower end of the sleeve extension 23 will pass over the end of the lever 36 and permit the spring 39 to restore the lever 36 to normal position, as shown in Fig. 7. It is therefore obvious that by reason of the construction above described assemblage of cartons may be performed rapidly and with a minimum effort upon the part of the operator as all he is required to do is to place a carton body and the closure members therefor upon a spindle at one station, swing the loaded spindle to assembling position and remove the assembled carton from its spindle at another station, the loading and unloading operations being performed during the time required for the operation of the assembling mechanism.

It will be understood that the construction shown in the accompanying drawings and herein described is of an illustrative character and is not restrictive and that various modifications can be made within the spirit and scope of the following claims.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A machine for assembling containers of the class described which comprises means for supporting the tubular body of the container in open position, means for supporting the locking ring and the closure member at the base of the body

extensions, means for spacing the closure member from the locking ring, means for folding the body extensions around the locking ring, and means for causing the closure member to clamp the end portions of said extensions against the locking ring.

2. A machine for assembling containers of the class described which comprises means for supporting the tubular body of the container in open position, yieldable means for supporting the locking ring and the closure member at the base of the body extensions, forming mechanism reciprocable axially of said body having means operable thereby to separate the closure member from the locking ring and then to fold the body extensions around the locking ring and to cause the yieldable closure supporting means to clamp the body extensions between the closure member and the locking ring.

3. A machine for assembling containers of the class described comprising a plurality of tubular spindles having carriers for respectively supporting a tubular container body and vertically movable means for supporting the closure members therefor movable successively into and out of assembling position, spring actuated means adapted to be engaged by the lower end of a spindle for automatically locking a loaded carrier in assembling position when moved to such position, downwardly movable forming mechanism for assembling the closure members upon the body and means operable by the downward movement of said closure supporting member for releasing said carrier locking means upon completion of the assembling operation to enable the assembled container to be moved to a position where it can be readily removed from its carrier.

4. A machine for assembling containers of the class described comprising a plurality of tubular spindles having carriers for respectively supporting a tubular container body and vertically movable means for supporting the closure members therefor movable successively into and out of assembling position, spring actuated locking means adapted to engage the lower end of a spindle when moved to assembling position, and means for assembling the closure members upon the body when in assembling position and automatically operable means actuated by said locking means when moved to locking position for starting the operation of the assembling means when the containers are moved to assembling position and conversely for arresting the operation of the assembling means upon completion of the assemblage of the container.

5. A machine for assembling containers of the class described comprising a plurality of carriers for respectively supporting a tubular container body and the closure members therefor movable successively into and out of assembling position, means for locking a carrier in assembling position, reciprocable forming mechanism for assembling the closure members upon the body when in assembling position, and means automatically operable by said carrier locking means for starting the operation of the forming mechanisms when a container is moved to assembling position and means operable by the reciprocable forming means upon completion of the assembling operation to unlock said locking means and arresting the operation of the assembling means.

6. A machine for assembling cartons of the class described comprising a plurality of carriers, for respectively supporting a tubular body and the closure members therefor, movable successive-

ly into and out of assembling position, means normally operable when a loaded carrier is moved to assembling position to lock it therein, forming mechanism and means for actuating the same to assemble the closure members upon the body when in assembling position, means operable by said forming mechanism for unlocking the carrier-locking means at the completion of the assembling operation, and means operable upon movement of said carrier away from assembling position to restore said carrier-locking means to normal position preparatory to locking the next succeeding loaded carrier when moved to assembling position.

7. A machine for assembling cartons of the class described comprising a turret having a plurality of spindles provided respectively with means for supporting the tubular body and closure members of the carton, each spindle having an extension projecting below the turret, spindle-locking means located in assembling position having a spring actuated plunger with a beveled upper end adapted to be forced downwardly when a spindle is moved to assembling position and provided with means to engage the spindle extension, vertically reciprocable forming mechanisms, and means for actuating the same to assemble the closure members upon its body when in assembling position, means operable by the forming mechanism for forcing the plunger downwardly to disengage it from the spindle extension at the completion of the operation of said forming means, means for locking the plunger in depressed position operable by said spindle extension to release said plunger locking means as the turret is rotated to place the next loaded spindle in assembling position.

8. A machine for assembling containers of the class described which comprises means for supporting the tubular body of the container in open position, yieldable means for supporting the locking ring and closure member at the base of the body extensions, forming mechanisms movable axially relatively to the container body having means respectively operable successively during said axial movement to bend the extensions inwardly, to fold the extensions around the locking ring, and means cooperating with said forming mechanism to clamp the closure member upon the portions of the extensions which underlie the locking ring.

9. A machine for assembling containers of the class described which comprises means for supporting the tubular body of the container in open position, yieldable means for supporting the locking ring and closure member at the base of the body extensions, forming mechanisms movable axially relatively to the container body having means respectively operable successively during said axial movement to space the closure member from said locking ring to bend said extensions inwardly, to fold the extensions around the locking ring, and cooperating with said forming mechanism to clamp the body extensions between the closure member and the locking ring.

10. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising a circular series of carton-supporting members movable successively to a closure-assembling position, forming mechanism reciprocable in axial alignment with the carton having respectively members operable successively during said axial movement in one direction to bend said

extensions inwardly, to fold the extensions around said ring, and to clamp the extensions upon said ring, and means automatically operable upon positioning a carton-supporting member in assembling position to lock said carton-supporting member therein, and means operable by said locking mechanism to actuate said forming mechanism and thereby cause movement of said forming mechanism in a direction to assemble the closure upon the body.

11. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising a circular series of carton-supporting members movable successively to a closure-assembling position, forming mechanism reciprocable in axial alignment with the carton having respectively members operable successively during said axial movement in one direction to bend said extensions inwardly, to fold the extensions around said ring, and to clamp the extensions upon said ring, spring actuated locking means automatically operable upon positioning a carton-supporting member in assembling position to engage and lock said carton-supporting member therein, and means operable by said locking mechanism when moved to locking position to actuate said forming mechanism and thereby cause movement of said forming mechanism in a downward direction to assemble the closure upon the body, and means operable by further downward movement of said forming mechanism after completion of said extension folding movement of the forming mechanism to depress said spring actuated locking means and release it from engagement with the carton supporting member and thereupon to discontinue the actuation of the forming mechanism.

12. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising a base, means mounted thereon for rigidly supporting the other end of the carton body provided with means for supporting the closure member in proximity to said ring, forming mechanism reciprocable in axial alignment with said carton having a member provided with annular means to bend said extensions inwardly, and a head, concentric therewith and movable relatively thereto, having means for folding the inwardly bent extensions about said ring, and means for actuating said annular bending member and said head in proper sequence.

13. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising a base, means mounted thereon for rigidly supporting the other end of the carton body provided with yieldable means slidably fitting within the carton body for supporting the closure member in proximity to said ring, forming mechanism reciprocably mounted in axial alignment with said carton having a circular member provided with a beveled lower wall forming a guide to engage the outer surface of said carton body, and an upper wall extending inwardly beyond said body, and a circular coiled spring between said walls yieldably to engage said extensions and bend them inwardly, a head concentric therewith and movable relatively thereto having means to engage and space said closure member from said ring and having means for

folding the inwardly bent extensions about said ring, means for actuating said annular bending member and said head in proper sequence to fold the extensions around said ring and to cause the upper wall of said bending member in cooperation with the closure-supporting member to clamp the body extensions upon said ring.

14. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising a frame having a base, standards extending vertically therefrom, and a yoke connecting the upper ends of said standards, means for rigidly supporting said carton body vertically between said standards with its extensions uppermost, a closure support resiliently mounted upon said body-supporting means to yield a predetermined amount, forming mechanism comprising a member slidably mounted on said standards having annular means for bending said extensions inwardly, a head reciprocally mounted in said yoke in axial alignment with said carton support having means to engage the closure member and upon downward movement to space the closure member from the locking ring, means reciprocally mounted on said head provided with folding arms operable by engagement with said head when downward movement of said head is arrested to fold said body extensions around said ring, and means for actuating the respective members of the forming mechanism in proper sequence.

15. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising a frame having a base, standards extending vertically therefrom, and a yoke connecting the upper ends of said standards, means for rigidly supporting said carton body vertically between said standards with its extensions uppermost, a closure support resiliently mounted upon said body-supporting means to yield a predetermined amount, forming mechanism comprising a member slidably mounted on said standards having annular means for bending said extensions inwardly, a head reciprocally mounted in said yoke in axial alignment with said carton support having means to engage the closure member and upon downward movement to space the closure member from the locking ring, means reciprocally mounted on said head provided with folding arms operable by engagement with said head when downward movement of said head is arrested to fold said body extensions around said ring, and means for actuating the respective members of the forming mechanism comprising a shaft mounted in said yoke having cams fixedly secured thereto engaging cam followers on the respective reciprocable members of the forming mechanism and having follower engaging faces so formed as to reciprocate the members of said forming mechanism in proper sequence.

16. A machine for assembling a closure upon one end of a carton body having means for supporting a locking ring near one end thereof, comprising a frame having a base, parallel standards extending vertically therefrom, a turret rotatably mounted on one of said standards having a circular series of spindles extending vertically therefrom and rotatably movable into assembling position each having rigid means for supporting a carton body and a yieldable sleeve within and extending upwardly therefrom having a plate

for supporting the closure member and a locking member extending downwardly from said sleeve, a yieldable locking plunger mounted in said base having a vertical socket to engage the locking member of said spindle, and an inclined upper surface adapted to be engaged by the locking member of said spindle and to be depressed thereby upon rotation of said turret to position a spindle in assembling position and thereupon to cause the spindle to be engaged in said socket.

17. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising a frame having a base, standards extending vertically therefrom and a yoke connecting the upper ends of the standards, vertically reciprocable forming mechanism mounted on said frame having means respectively operable upon downward movement in one direction to bend and fold the carton extensions around the locking ring, a turret rotatably supported upon said base having a circular series of carton-supporting spindles each provided with means for rigidly supporting a carton with its extensions and locking ring uppermost and having yieldable means for supporting the closure in proximity to the locking ring, complementary means on said spindles and said base for locking a spindle in axial alignment with said forming mechanism when moved to assembling position, means operable upon engagement of said complementary locking means to actuate said forming mechanism to fold said extensions around said ring and thereafter to force the closure-supporting means downwardly, and means operable by the downward movement of the closure-supporting means to release the locking means and thereby permit rotation of said turret to position another spindle in carton-assembling position.

18. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising a frame having a base, standards extending vertically therefrom and a yoke connecting the upper ends of the standards, vertically reciprocable forming mechanism mounted on said frame having means respectively operable upon downward movement in one direction to bend and fold the carton extensions around the locking ring, a turret rotatably supported upon said base having a circular series of carton-supporting spindles each provided with means for rigidly supporting a carton with its extensions and locking ring uppermost and having yieldable means for supporting the closure in proximity to the locking ring, complementary means on said spindles and said base for locking a spindle in axial alignment with said forming mechanism when moved to assembling position, means operable upon engagement of said complementary locking means to actuate said forming mechanism to fold said extensions around said ring and concurrently to force the closure-supporting means downwardly, means operable by the downward movement of the closure-supporting means to release the locking means and thereby permit rotation of said turret to position another spindle in carton-assembling position, and means operable upon downward movement of said forming mechanism and said closure-supporting means to release said locking means upon completion of said movement.

19. A machine for assembling closures on tu-

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bular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising a frame having a base, standards extending vertically therefrom, forming mechanism reciprocally mounted on said standards having a circular series of pivotally mounted members for folding said extensions around said ring, a turret rotatably mounted on one of said standards having a circular series of spindles extending vertically upwardly therefrom and rotatably movable into assembling position each having rigid means for supporting a carton body and a yieldable sleeve extending upwardly therefrom having at its upper end a plate for supporting the closure, a locking member extending downwardly from said spindle, a spring actuated locking plunger mounted in said base in axial alignment with said forming mechanism having a vertical socket to engage the locking member of said spindle and an inclined upper surface adapted to be engaged by the locking member of the spindle and to be depressed thereby upon rotation of a spindle of said turret to assembling position, means for actuating the forming mechanism to cause the members thereof to fold the extensions of said carton around the locking ring and to force downwardly the closure-supporting plate and sleeve, and a rod connected to said closure-supporting plate and sleeve extending axially of said spindle operable upon downward movement of the closure-supporting plate to force the locking plunger downwardly out of engagement with the locking member of the spindle, means for releasably holding the locking plunger in depressed position, whereby upon upward movement of the forming mechanism and the closure-supporting spindle the turret will be free for rotation and means for releasing said plunger-holding means when the turret is rotated to move the carton-supporting spindle from assembling position.

20. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising means for rigidly supporting a carton body and locking ring in assembling position and having means for yieldably supporting a closure member in proximity to the locking ring, forming mechanism reciprocable axially of said carton-supporting means having means respectively for bending said extensions inwardly and a relatively movable head concentric therewith having means for folding the inwardly bent extensions around said ring, a rotatable shaft having cams and means operable thereby during one revolution of said shaft to impart relative downward movement to said extension-bending means and said head successively to bend and fold said extensions around the locking ring and thereafter to raise said forming mechanism, a continuously operated driving mechanism rotatably mounted upon said shaft, cooperating clutch members on said shaft and driving member, and means for causing engagement of said clutch members at the beginning of and disengagement thereof at the end of one complete revolution of said shaft.

21. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising means for rigidly supporting a carton body and locking ring in assembling position and having means for yieldably supporting a closure member in proximity to the locking ring, forming

mechanism reciprocable axially of said carton-supporting means having means respectively for bending said extensions inwardly and a relatively movable head concentric therewith having means for folding the inwardly bent extensions around said ring, a rotatable shaft having cams and means operable thereby during one revolution of said shaft to impart relative downward movement to said extension-bending means and said head successively to bend and fold said extensions around the locking ring and thereafter to raise said forming mechanism, a continuously operated driving mechanism rotatably mounted upon said shaft, cooperating clutch members on said shaft and driving member, means for causing engagement of said clutch members at the beginning of and disengagement thereof at the end of one complete revolution of said shaft, and braking means operable to resist rotation of said shaft immediately in advance of the completion of a single revolution thereof.

22. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable around said ring, comprising a frame having a base, standards extending vertically upwardly therefrom, a cam shaft mounted on said frame, forming mechanism having relatively movable members for wrapping the extensions of said carton about a locking ring reciprocally mounted on said frame, cams on said cam shaft and means operable thereby to actuate the respective members of said forming mechanism in proper sequence, continuously rotating driving means rotatably mounted on said cam shaft, a one-revolution clutch mechanism for connecting said driving means with said shaft, a turret mounted on said base having a plurality of carton-supporting spindles movable successively into assembling position in axial alignment with said forming mechanism, yieldable means adapted to engage and lock a carton-supporting spindle when moved to assembling position, and means operable by the movement of said spindle-locking means to cause engagement of said one-revolution clutch mechanism with the rotatable driving means whereby assemblage of the closures upon the carton will be effected by a single reciprocation of said forming mechanism.

23. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable about said ring, comprising a frame having a base, standards extending vertically therefrom, a cam shaft mounted in said frame, forming mechanism having relatively movable members for wrapping the extensions of said carton about the locking ring reciprocally mounted on said frame, cams on said cam shaft and means operable thereby to actuate the respective members of said forming mechanism in proper sequence, a turret mounted on said base having arms provided with vertical carton-supporting spindles successively movable into axial alignment with said forming mechanism, means mounted on said base having spring-actuated means to engage and lock said turret when a carton-supporting spindle is moved to assembling position, means for rotating said cam shaft including an electrically controlled single revolution clutch, and means operable by the movement of said spindle-locking means when engaged by a spindle to complete the electric circuit of said clutch-controlling mechanism and thereby to cause one revolution of the cam shaft,

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24. A machine for assembling closures on tubular carton bodies having means for supporting a locking ring near one end and extensions projecting therebeyond foldable about said ring, comprising a frame having a base, standards extending vertically therefrom, a cam shaft mounted in said frame, forming mechanism having relatively movable members for wrapping the extensions of said carton about the locking ring reciprocably mounted on said frame, cams on said cam shaft and means operable thereby to actuate the respective members of said forming mechanism in proper sequence, a turret mounted on said base having arms provided with vertical carton-supporting spindles having means for yieldably supporting a closure disc in proximity to the locking ring and adapted to be forced downwardly by said forming mechanism, said spindles being successively movable into axial alinement with said forming mechanism, means mounted on said base having spring actuated means to engage and lock said turret when a carton-supporting spindle is moved to assembling

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position, means for rotating said cam shaft including a solenoid-controlled single revolution clutch, means operable by the movement of said spindle-locking means when engaged by a spindle to complete the electric circuit of said solenoid, thereby to cause a single revolution of said cam shaft, and means operable by the downward movement of said forming mechanism to release said spindle-locking means and thereby break the solenoid circuit.

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