March 28, 1944. G. S. SILLARS 2,345,012

STACKING APPARATUS

Filed June 23, 1942 4 Sheets-Sheet 1

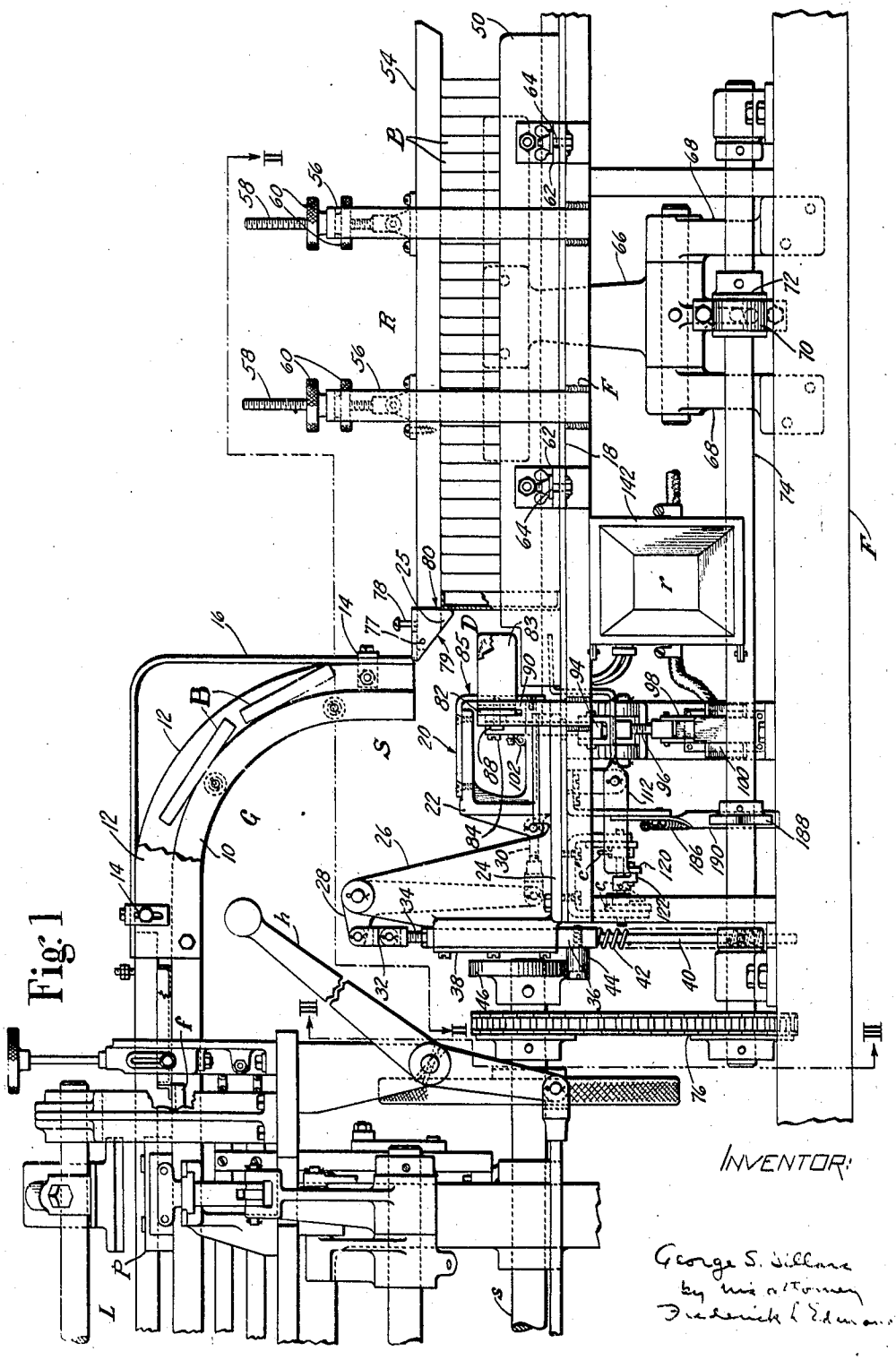


Fig. 1

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STACKING APPARATUS

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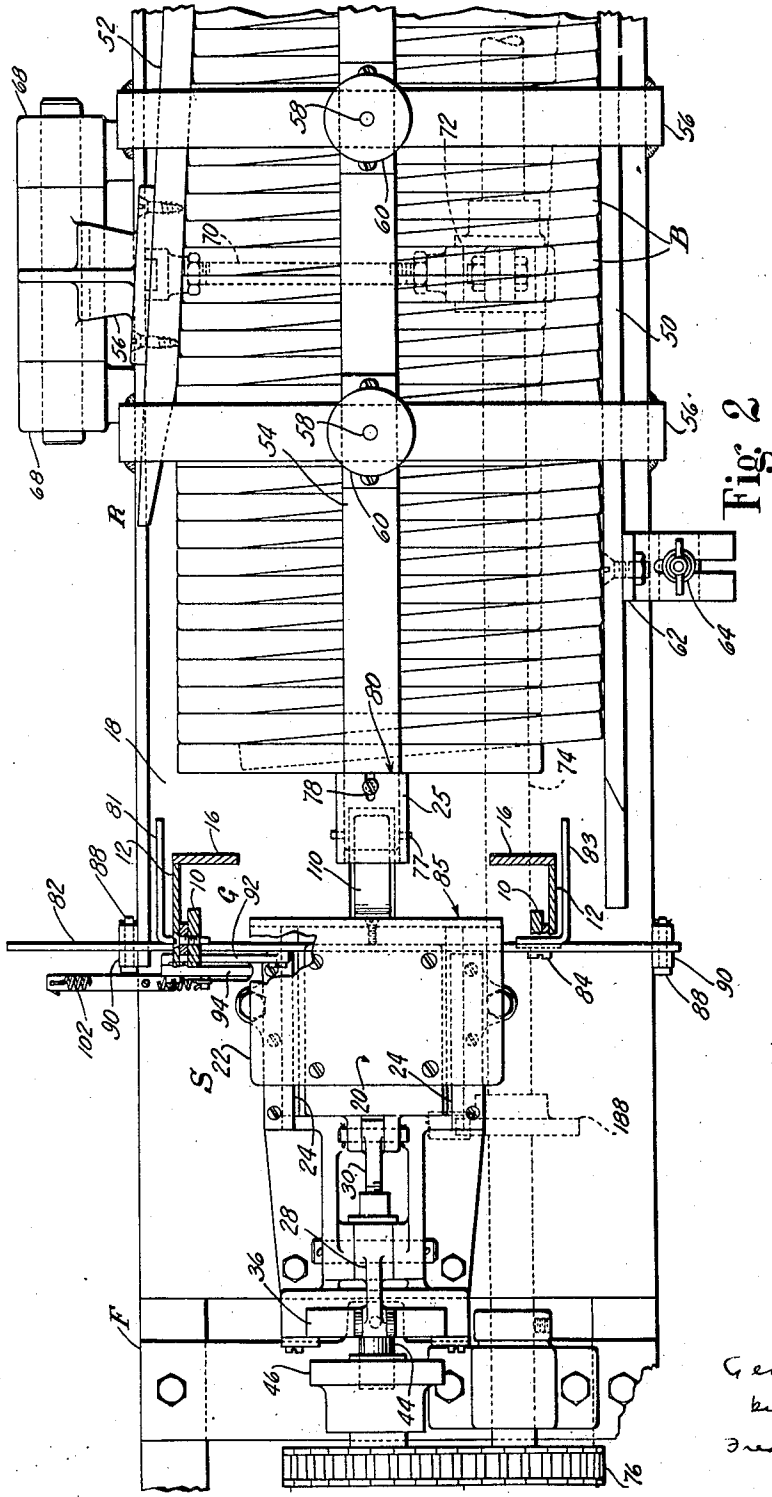


Fig. 2

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STACKING APPARATUS

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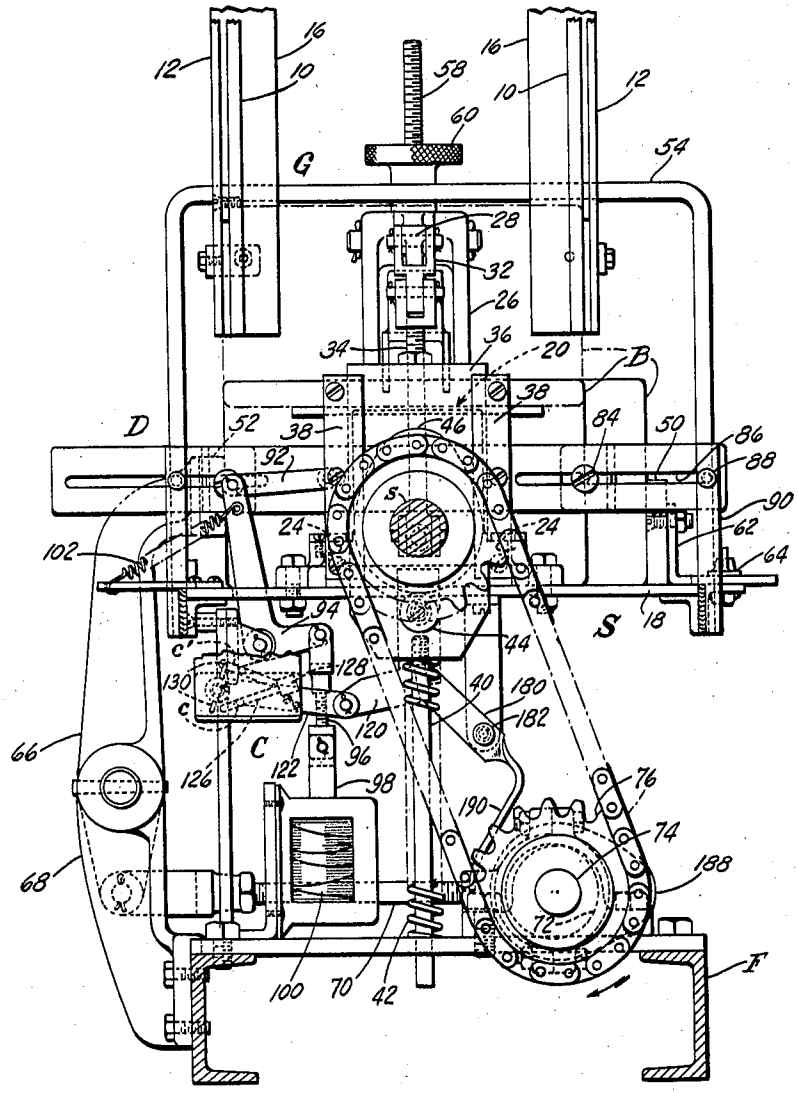


Fig. 3

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STACKING APPARATUS

Filed June 23, 1942 4 Sheets-Sheet 4

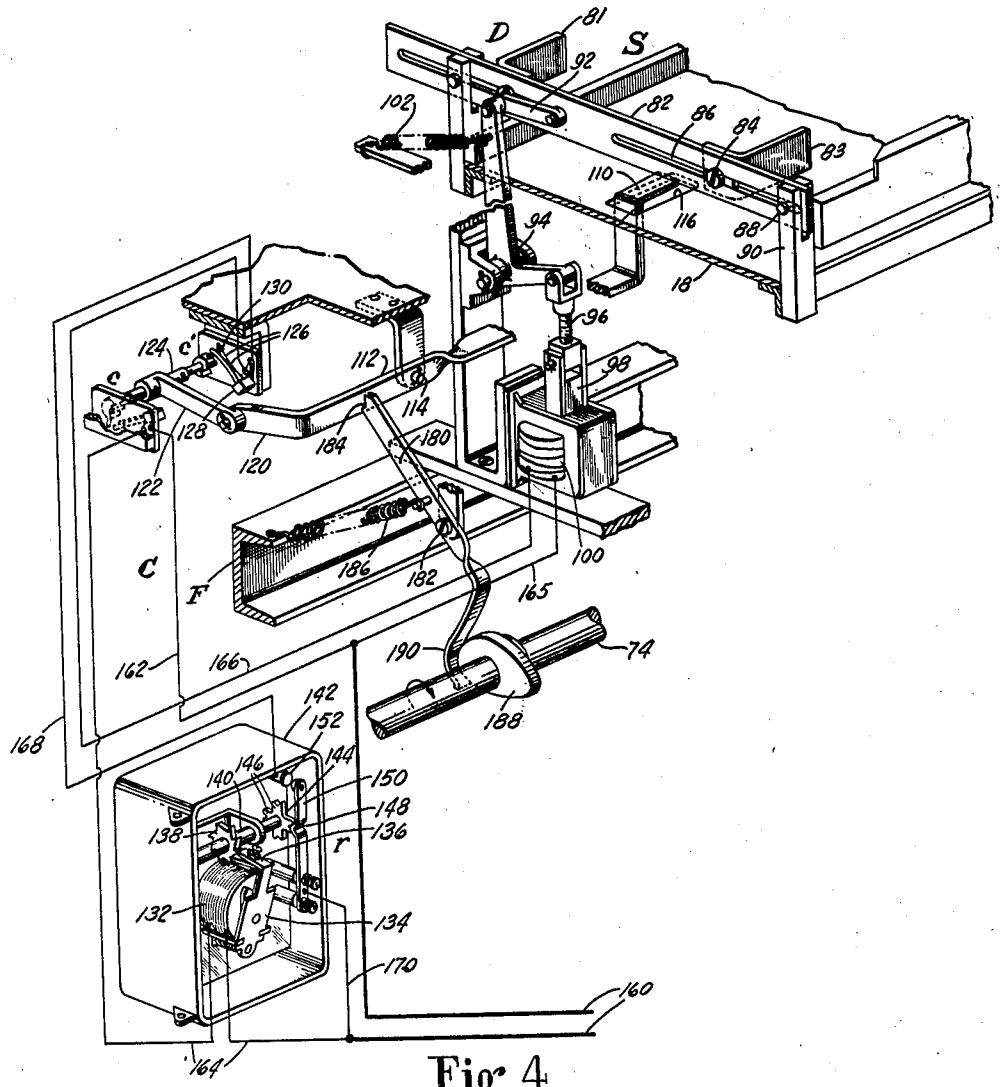


Fig. 4

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2,345,012

UNITED STATES PATENT OFFICE

2,345,012

STACKING APPARATUS

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Application June 23, 1942, Serial No. 448,168

26 Claims. (Cl. 214—7)

The present invention is concerned with apparatus for stacking or arranging in a series various articles. Especially is it applicable to the nesting of such walled articles as box-parts, including either the body-portions or covers. Hereinafter in the detailed description, these parts are referred to generally as covers. In the manufacture of box-parts after they have been formed and their walls secured, it is a common practice to nest them in stacks, so they may be transferred conveniently to some other point, as that at which they are packed in cases. Since the walls of these parts are ordinarily parallel, they can be nested at one extremity only, each part lying within the preceding part in the stack at one end and projecting outside it at the opposite end. This projecting portion in turn receives the succeeding part. It is an object of this invention to effect the nesting or stacking of the box-parts automatically immediately upon their delivery from a machine which has operated upon them, this being by simple and effective means, which is controlled by the contact of such parts and which ensures the correct formation of the stack, regardless of the lack of continuity in the supply to the stacking apparatus from the delivering machine.

This result is achieved by combining with delivering means for the box-parts, this being herein shown as the feeding means of a labeling machine, a support upon which the box-parts are delivered, means for positioning the parts upon the support, with an end of each box-part spaced from the corresponding end of the preceding part, a member movable by the parts for controlling the positioning means, and a stacking member movable in engagement with the box-parts upon the support. The stacking member is preferably in continuous operation, while the controlling member is rendered effective by a portion only of the box-parts. By exercising this control for alternate covers only, the stacking member will be caused to nest the covers in alternately inclined relation. Further, because the controlling action occurs only when a box-part is in place for stacking, the symmetrical arrangement of the stack continues whenever the supply is resumed after its interruption. Such interruptions are particularly liable to occur in connection with machines of the character of those used for labeling boxes, and which are hand-fed. In these labeling machines, the box-parts travel horizontally, resting upon their tops. For stacking, however, the parts are most conveniently supported upon their sides. I, therefore, deliver the box-parts horizontally into a guideway which directs them vertically upon a support on which they are stacked. The apparatus of this invention may include, more specifically, with the stacking support or table and the stacking member movable over it, a positioning member movable across the table in engagement with the box-parts, a solenoid or other electromagnetic means for operating the positioning member, a feeler movable by each delivered box-part, and means controlled by the feeler for energizing the electromagnet. To effect the nesting of the stack, this energization occurs only upon the delivery of alternate box-parts. The control by the feeler is exerted through a contact device, which in turn governs a relay, this relay being preferably of such an alternating character that it closes its contacts only after a plurality of actuations of the contact device. To ensure full operation of the solenoid, the contact device is double, there being two sets of contacts closed in alternation, one energizing the solenoid and the other deenergizing it. There may further be means, as a latch, by which the feeler may be retained temporarily after its actuation, together with means for releasing the latch, this being shown as accomplished by a cam movable in timed relation with the delivering means.

One of the several possible embodiments of the invention is illustrated in the accompanying drawings, in which

Fig. 1 shows my improved stacking apparatus in side elevation;

Fig. 2 is an enlarged horizontal section on the line II—II of Fig. 1;

Fig. 3, an enlarged vertical section on the line III—III of Fig. 1; and

Fig. 4, a detail in perspective of the mechanism for controlling the nesting of the box-parts.

At L appears the delivery-end of a machine for performing an operation upon covers or other box-parts B, as the affixing of a label or labels to the end-walls, which are shorter than the side-walls. For the labeling operations, the covers are advanced successively step by step under the influence of feeding mechanism *f* and resting upon their tops, the last operating step being performed by a pair of oscillatory pressure members, one of which appears at *p*. Power is supplied to each of the labeling mechanisms from a longitudinally extending shaft *s*, which turns once for each labeled cover delivered. The rotation of the power-shaft may be governed by a hand-lever *h*.

As the successive covers are ejected horizontally from the machine L by the feeding mechanism

f, they are received by a guideway G having spaced tracks 10, 10, upon which the ends of the covers rest with their open sides up. They are retained against displacement transversely of the tracks by side-walls 12, 12. The tracks and walls are extensions of and are supported for transverse adjustment with like tracks and walls of the labeling machine. They curve downwardly from the horizontal to the vertical in an arc which facilitates the change of direction. To the walls 12 is attached at 14, 14 for vertical adjustment a shield 16, which, as the covers change their direction of advance, keep them from being projected from the guideway. The covers fall from the guideway above the rear extremity of a table 18, carried by the frame F of the stacking apparatus S. The thus-delivered covers have been turned through 90° and rest upon their lower side-walls, on the upper horizontal surface 20 of a stacking plunger 22 guided to reciprocate in horizontal ways 24, 24 upon the table. Upon the plunger the cover is temporarily held substantially erect by the retention of its upper portion within the guideway. When the plunger is retracted, the cover will be deposited upon the table, it falling through a comparatively short distance. In this position, it will be between the forward end of the plunger and a displaceable retaining member 25. The movement of the plunger is in synchronism with the delivery of the covers from the labeling machine, so it acts in the correct time-relation upon each. Fulcrumed in brackets 26 rising from the table is a bell-crank-lever 28, a depending arm of which is joined to the plunger by a link 30. A substantially horizontal arm of the lever is connected by a link 32 to a rod 34 adjustably threaded into a slide 36, movable in spaced vertical ways 38 at the rear of the table. Depending from the slide is a rod 40, guided at its lower extremity in the frame F and surrounded by an expansion-spring 42. Rotatable upon the slide about a horizontal axis is a roll 44, which the spring urges against the periphery of a cam 46 fast upon the forward end of the shaft s. For each turn of the shaft, and therefore for each cover delivered from the guideway G, the plunger 22 is reciprocated to advance the cover to assemble it in a stack with those which have preceded it.

The table 18 extends from the plunger 22 to furnish, with side-walls 50, 52 and a top-bar 54, a stack-receiver R for the covers B. The top-bar is supported upon bridge-pieces 56, 56, rising from opposite sides of the table, it being suspended upon threaded rods 58, 58 passing through the bridge-pieces and adjustable vertically by nuts 60, 60. It is so positioned that the upper side-walls of the covers, of whatever width is being operated upon, engage its undersurface, this giving sufficient resistance to advance to ensure that the covers shall be held together as they are successively forced forward by the plunger. The wall 50 is carried upon the table by brackets 62, 62, adjustable transversely by slot and screw connections 64, 64 to accommodate covers of different lengths. The opposite wall 52 converges towards its companion in the direction of advance of the covers, and is reciprocated across the table to compact the stack, forcing the nested covers together in the direction of their length and making the assembly firm and stable for handling. This movement of the wall 52 is obtained by mounting it upon the upper extremity of a lever 66, fulcrumed upon brackets 68 and oscillated by an eccentric-rod 70 and an eccentric 72, the latter being fast upon a shaft 74 journaled longitudinally of the frame F and rotated from the shaft s through equal-ratio sprocket-gearing 76. The member 25, which has already been referred to as retaining the covers in position upon the table 18 in front of the plunger, may also serve to hold the advanced covers against rearward displacement. It is shown as pivoted at 77 upon the inner end of the bar 54, having spaced walls lying at opposite sides of said bar. Its contraclockwise movement about its pivot (Fig. 1) is limited by a stop-pin 78, rising from the bar through a slot in the top of the retaining member and provided with a head, into contact with which said retaining member may swing. A deposited cover resting upon the table in front of the plunger 28 is held by engagement with the downwardly and forwardly inclined edges 79 of the retaining member from tilting too far away from the plunger. When, however, the plunger in its reciprocation forces the cover forward, its upper portion acting upon the inclined edges displaces the retaining member about its pivot and is advanced to the opposite side. When the member is thus freed, it swings back to its normal position at which the vertical edges 80 positively prevent rearward movement of the cover.

To nest the covers B in the stack in alternately inclined relation, the plunger 22 acts upon every other cover delivered by the guideway G, in the position in which it falls upon the table 18, while the alternate covers are shifted in the direction of their length, until the ends of succeeding covers are at different distances from the center of the table. Consequently, one end of each cover may be caused to enter between the side-walls of the preceding cover. To thus stagger the covers, each, as it is deposited upon the table, lies with its ends between contact-walls 81 and 83 of a positioning device D. The walls are shown as in the form of angle-pieces adjustably secured to a supporting slide-bar 82 by screws 84 passing through slots 86 in the bar. They may thus be varied in their relation to the plunger 22 and to each other as the covers change in length. The wall 81 acts by engagement with the end of a cover to change its position, while the wall 83 maintains the cover against lateral displacement as it falls from the guideway. The bar passes through the plunger, which has a skeleton structure, the walls 81 and 83 extending forwardly beyond the cover-advancing surface 85. The slots 86 may also be utilized as mounting means for the bar, they receiving studs 88, 88 passing horizontally through posts 90, 90 rising from the table, and between the divided upper ends of which the bar is movable. Said bar is joined by a link 92 to the vertical arm of a bell-crank-lever 94, fulcrumed upon the frame and having a horizontally extending arm connected to the plunger 98 of a solenoid 100 by a link 96, adjustable as to length. A tension-spring 102 holds the plunger of the solenoid normally raised and the contact-walls 81 and 83 in their extreme normal positions. This movement, which is toward the left as viewed in Fig. 4, may be limited by contact of the vertical arm of the lever 94 with its mounting, the relation of the walls being altered by adjustment of the link 96. A cover acted upon by the plunger, with the positioning device thus related, will be carried forward upon the table with its left extremity close to the wall 52. The succeeding cover should be shifted to the right

across the face of the plunger, so, as it is advanced, it may nest with the other in the inclined relation appearing in Fig. 2. This is accomplished by the positioning device D under the control of the weight of alternately delivered covers acting upon mechanism C.

The controlling mechanism C may be seen best in Fig. 4 of the drawings. As a cover falls from the guideway G upon the table 18, it contacts with the substantially horizontal end 110 of a feeler-lever 112 fulcrumed at 114 upon the frame. This end 110 rises normally through an opening 116 in the table, it being held up yieldably by the weight of the opposite end of the feeler. Since the covers descend upon the feeler through the short distance from the top of the plunger 22 and always in the same direction, the displacing force they exert on the feeler is uniform. To an angular end 120 of the feeler an arm 122 is pivoted, this arm being fast upon a shaft 124 included in a double contact device *c*, *c'*. Each contact device has a pair of spring-terminals 126, 126, mounted upon an insulating block 128 with their outer ends diverging. Extending from each extremity of the shaft 124 is a projection 130 of insulating material, so located that, as the shaft is oscillated, one pin will be forced between the ends of the springs to separate them, while the other is spaced from the springs so these may contact. Then this relation is reversed. As the connecting circuit is illustrated in Fig. 4, when the end 110 of the feeler-lever is above the table 18, the projection 130 for the contact device *c* is withdrawn from the springs so the circuit is closed at this point, while at the device *c'* it is open. The contact devices are in circuit with an alternating relay *r* and with the solenoid 100. The relay has an electromagnet 132 acting upon a pivoted armature 134, the free angular end 136 of which engages one of eight teeth of a wheel 138 attached to a shaft 140 rotatable in the relay-casing 142. The shaft, which is thus rotated through successive steps when the relay-armature is actuated, also has fixed upon it an operating member 144 provided with four equally spaced arms 146, in the end of each of which is a depression. The arms for alternate energizations of the magnet 132 engage a projecting portion 148 of a terminal-spring 150, to remove the end of said spring from engagement with a fixed terminal 152 and temporarily hold it with the projection resting in the arm-depression, thus opening the circuit joined to the terminals. The next energization of the magnet so turns the operating member, that the spring-projection 148 lies in the space between the arms 146, allowing the spring-terminal to make contact with the fixed terminal. Consequently, each closure of the circuit controlled by these contacts requires the relay to be twice energized.

The controlling mechanism C acts in the following manner. Assume that an operating cycle begins after the movement of a cover B to the right by the positioning device D. The contact-portion 110 of the feeler 112 will be raised; the contact device *c* will be closed and *c'* open. Current is supplied from line-conductors 160, 160 to the relay-magnet 132, through conductor 162, contact device *c* and conductor 164. The relay *r* is thereby energized and has caused an arm of the member 144 to engage the spring 150, holding it away from the terminal 152. The energizing circuit of the solenoid 100, through the conductors 165, 166, 168 and 170, is open at the contacts 150, 152 and at *c'*. The positioning device D is drawn to the left by the spring 102, with the plunger 98 of the solenoid raised. This is as appears in Fig. 4. When a cover falls upon the end 110 of the feeler, the contact device *c* is opened and *c'* closed. The former causes the release of the relay, the armature of which is retracted ready for the succeeding operation. While the circuit of the solenoid is completed at *c'* between the conductors 166 and 168, it is still broken at the terminals 150, 152 of the relay. Said solenoid, therefore, remains inactive and the positioning device D at rest. So, upon advance of the stacking plunger 22, the cover is carried forward at the left of the table 18. This allows the end of the feeler to rise, so the relation of the contact devices is again reversed, *c* being closed and *c'* opened. As before, the relay *r* is energized, but now a space between adjacent arms of the member 144 is brought opposite the projection of the spring 150, allowing it to engage the terminal 152. Although this effects a connection between the conductors 168 and 170, the circuit of the solenoid is still open at the contact device *c'*. The next cover acting upon the feeler opens the contact device *c* and closes *c'*. The relay is de-energized, but its contacts are permitted to remain closed by the member 144. There is now an energizing circuit from the line 160 for the solenoid 100, through conductors 165 and 166, contact device *c'*, conductor 168, relay-contacts 152, 150, and conductor 170. This causes the movement of the positioning device D to the right, so the cover, acted upon by the contact-wall 81, is shifted laterally across the table to stagger it with respect to the preceding cover. Therefore, when the plunger 22 advances it over the table 18, it will be nested in the stack in inclined relation. The cover-positioning cycle is then repeated. The double contact device provides for a full energization of the solenoid, the closure of one of the contact devices causing the positioning device to complete its cover-shifting travel, to be returned by the spring 102 when the other contact device is closed.

As a cover strikes the end 110 of the feeler, it tends to rebound and set said feeler in vibration. This might cause an objectionable flutter of the contact devices *c* and *c'*, so the solenoid 100 will not be energized to cause full movement of the stacking member 22. As a further guard against this, a latch 180 may be provided for the feeler-lever 112. This latch is in the form of a lever 190, fulcrumed at 192 upon the frame and having a shouldered end 184 drawn by a tension-spring 186 beneath the feeler, when the angular end 120 of said feeler is raised during the operating period of the positioning device D. The end 184 of the latch normally rests against the side of the feeler, but, when this is swung up by a descending cover, it will be drawn beneath it, so the contact device *c* will positively be retained open and *c'* closed. The latch is released at the appropriate period in the positioning cycle, after the energization of the solenoid 100, by a cam 188 secured to the shaft 74 and therefore operating in timed relation with the delivery from the labeling machine. A projection upon the cam strikes a curved arm 190 of the latch, withdrawing the shoulder 184 from the feeler and leaving the end 110 free to rise for actuation by the succeeding cover.

To outline briefly the general operation of the apparatus, covers or other box-parts B, which have had labels affixed by the machine L or have

been otherwise operated upon, are received successively in a horizontal direction by the guideway G and deposited vertically upon their side-walls on the table 18 of the stacker S in front of the plunger 22. Here, they depress the feeler 110, 112, this controlling the circuit for the solenoid 100, through the contacts c and c' and the alternatnig relay r of the mechanism C, causing the positioning device D to move its wall 81 across the table in engagement with the end of every other cover coming from the labeler. The stacking plunger, reciprocating continuously in timed relation with the delivered covers, therefore advances these from different transverse positions across the table. The covers are thus staggered, so that, as the plunger forces each into the stack-receiver R, the outer ends will be closely adjacent to the respective side-walls 52 and 50 of the receiver. But the inner ends will be spaced alternately from these walls, so they will enter and nest between the side-walls of the covers to form a closely assembled stack, which may be handled conveniently and without danger of separation. This compact character of the stack is increased by the reciprocation of the side-wall 52, which forces the nested covers together longitudinally. If there is a break in the delivery of the covers from the labeler the character of the stack is unaffected, because, upon actuation of the feeler by a cover, the mechanism C always assumes its control of the positioning device D in the correct sequence from the period in the positioning cycle at which it was interrupted. The symmetrical alternate oppositely inclined relation of the stack is, therefore, preserved, regardless of the time at which the delivery to the stacker is resumed.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In apparatus for stacking box-parts, means for delivering box-parts, a support upon which they are delivered, means for positioning the box-parts upon the support, with an end of each box-part spaced from the corresponding end of the preceding part, a member movable by the box-parts for controlling the positioning means, and a stacking member movable in engagement with the box-parts upon the support to cause the spaced ends to be nested.

2. In apparatus for stacking box-parts, means for delivering box-parts, a support upon which they are delivered, means for positioning the box-parts upon the support, a member movable by the box-parts for controlling the positioning means, means whereby the controlling member is rendered effective by a portion only of the box-parts, and a stacking member movable in engagement with the box-parts upon the support.

3. In apparatus for stacking box-parts, means for delivering box-parts, a support upon which they are delivered, means for positioning the box-parts upon the support, a member movable by the box-parts for controlling the positioning means, means whereby the controlling member is rendered effective by a portion only of the box-parts, a stacking member movable in engagement with the box-parts upon the support, and means for operating the stacking member continuously.

4. In apparatus for stacking box-parts having side-walls and shorter end-walls, means for delivering box-parts, a support upon which they are delivered upon their side-walls, a positioning member for the delivered parts movable in cooperation with the support and in the direction of extension of the side-walls, means for moving the member, a controlling member for the moving means operable by a box-part upon its delivery, and a stacking member movable in engagement with the box-parts at the positioning member.

5. In apparatus for stacking box-parts, means for delivering box-parts, a support upon which they are delivered, a positioning member for the delivered parts movable in co-operation with the support and transversely to the direction of delivery, means for moving the member, a controlling member for the moving means operable by a box-part upon its delivery, means for rendering the controlling member effective only after its operation by a plurality of the box-parts, and a stacking member movable in engagement with the box-parts at the positioning member.

6. In apparatus for stacking box-parts, means for delivering box-parts, a support upon which they are delivered, means for positioning the box-parts upon the support, a member movable by the box-parts for controlling the positioning means, and a stacking member movable in engagement with the box-parts, said stacking member receiving the box-parts from the delivering means and depositing them upon the controlling member.

7. In an apparatus for nesting covers in a stack, means for delivering the covers, a support upon which the covers are delivered, a positioning member for delivered covers movable in co-operation with the support transversely of the direction of delivery, means for moving the member, a controlling member for the moving means operable by each cover upon its delivery, means for rendering the controlling member effective in its operation for alternate covers only, and a member movable to nest the alternately positioned covers in a stack in oppositely inclined relation.

8. The combination with a machine for operating upon box-parts and provided with means for advancing said box-parts horizontally, of a guideway by which the advanced box-parts are received and directed vertically, a table upon which the box-parts are delivered, means for positioning the box-parts upon the table to arrange the ends of successive parts at different distances from the center of said table, a member movable by the box-parts as they are delivered upon the table for controlling the positioning means, and a stacking member movable in engagement with the box-parts at the positioning means.

9. The combination with a machine for labeling box-parts, said machine being provided with means for feeding the labeled box-parts, of a guideway into which the box-parts are advanced by the feeding means, a table upon which the box-parts are delivered, means for positioning the delivered box-parts upon the table to arrange the ends of successive parts at different distances from the center of said table, a member movable by the box-parts as they are delivered for controlling the positioning means, and a stacking member movable in engagement with the box-parts at the positioning means.

10. The combination with a machine for labeling covers, said machine being provided with means for advancing the labeled covers horizontally, of a guideway by which the advanced covers are received and directed vertically, a table upon which the box-parts are delivered upon their sides, means below the guideway for positioning the box-parts upon the table, a member movable

by the covers as they are delivered to the table for controlling the positioning means, means for rendering the controlling member effective in its operation for alternate covers only, and a member movable to nest the alternately positioned covers in a stack in oppositely inclined relation.

11. In an apparatus for stacking box-parts, a stacking table, means for delivering box-parts to the table, a positioning member movable across the table in engagement with the delivered box-parts, electromagnetic means for operating the positioning member, a feeler movable by each delivered box-part, means controlled by the feeler for energizing the electromagnetic means, and a stacking member movable over the table.

12. In an apparatus for stacking box-parts, a stacking table, means for delivering box-parts to the table, a positioning member movable across the table in engagement with the delivered box-parts, electromagnetic means for operating the positioning member, a feeler movable by each delivered box-part, means controlled by the feeler for energizing the electromagnetic means only upon the delivery of alternate box-parts, and a stacking member movable over the table.

13. In an apparatus for stacking box-parts, a stacking table, means for delivering box-parts to the table, a positioning member movable across the table in engagement with the delivered box-parts, electromagnetic means for operating the positioning member, a feeler movable by each delivered box-part, a contact device actuated by the feeler, a relay governed by the contact device, the electromagnetic means being controlled by the contact device and relay, and a stacking member movable over the table.

14. In an apparatus for stacking box-parts, a stacking table, means for delivering box-parts to the table, a positioning member movable across the table in engagement with the delivered box-parts, electromagnetic means for operating the positioning member, a feeler movable by each delivered box-part, a contact device actuated by the feeler, a relay governed by the contact device to close its contacts only after a plurality of actuations of the contact device, the electromagnetic means being controlled by the contact device and relay, and a stacking member movable over the table.

15. In an apparatus for stacking box-parts, a stacking table, means for delivering box-parts to the table, a positioning member movable across the table in engagement with the delivered box-parts, a solenoid for operating the positioning member, a feeler movable by each delivered box-part, two contact devices opened and closed in alternation by the feeler, a relay governed by the contact devices. the solenoid being controlled by the contact devices and the relay, and a stacking member movable over the table.

16. In an apparatus for stacking box-parts, a stacking table, means for delivering box-parts to the table, a positioning member movable across the table in engagement with the delivered box-parts, electromagnetic means for operating the positioning member, a feeler movable by each delivered box-part, means for temporarily retaining the feeler in the position to which it is thus moved, means controlled by the feeler for energizing the electromagnetic means, and a stacking member movable over the table.

17. In an apparatus for stacking box-parts, a stacking table, means for delivering box-parts to the table, a positioning member movable across the table in engagement with the delivered box-parts, electromagnetic means for operating the positioning member, a feeler movable by each delivered box-part, a latch for the feeler, means for periodically releasing the latch, means controlled by the feeler for energizing the electromagnetic means, and a stacking member movable over the table.

18. In an apparatus for stacking box-parts, a stacking table, means for delivering box-parts to the table, a positioning member movable across the table in engagement with the delivered box-parts, a solenoid for operating the positioning member, a feeler movable by each delivered box-part, means controlled by the feeler for energizing the solenoid upon the delivery of alternate box-parts, a latch for the feeler, means for releasing the latch after the action of the solenoid, and a stacking member movable over the table.

19. In an apparatus for stacking box-parts, a stacking table, means for delivering box-parts to the table, a positioning member movable across the table in engagement with the delivered box-parts, a solenoid for operating the positioning member, a feeler movable by each delivered box-part, means controlled by the feeler for energizing the solenoid upon the delivery of alternate box-parts, a latch for the feeler, a cam movable in timed relation with the delivering means for releasing the latch, and a stacking member movable over the table.

20. In an apparatus for stacking box-parts, a table having a horizontal work-supporting surface in which is an opening, means for delivering box-parts upon the table, a feeler fulcrumed beneath the table and extending through the opening for actuation by each box-part delivered, a box-part-positioning device reciprocating along the upper surface of the table under the control of the feeler, and a stacking plunger reciprocating above the table for engagement with the box-parts at the positioning device.

21. In an apparatus for stacking box-parts, a table, means for delivering box-parts upon the table, a box-part-positioning device movable above the table, and a stacking plunger having an opening therethrough and reciprocating above the table for engagement with the box-parts, the positioning member extending through said opening.

22. In an apparatus for stacking box-parts, a table, means for delivering box-parts upon the table, a feeler extending above the table for depression by each box-part delivered, a slide guided for reciprocation transversely of the table under the control of the feeler, said slide having a box-part-engaging wall, and a stacking member movable above the table for engagement with box-parts at the slide.

23. In an apparatus for stacking box-parts, a table, means for delivering box-parts upon the table, a feeler extending above the table for depression by each box-part delivered, a slide guided for reciprocation transversely of the table under the control of the feeler, said slide having a box-part-engaging wall, and a stacking member movable above the table for engagement with box-parts at the slide, the stacking member having a surface upon which said parts rest temporarily before their delivery to the feeler.

24. In an apparatus for stacking box-parts, a table, means for delivering box-parts upon the table, a feeler extending above the table for depression by each box-part delivered, a slide guided for reciprocation transversely of the table under the control of the feeler, said slide having spaced

box-part-engaging walls variable in position upon it, and a stacking plunger reciprocating above the table for engagement with box-parts at the slide.

25. In an apparatus for nesting box-parts, a support upon which the parts are delivered, means operative for positioning only the alternate parts upon the support with one end of each box-part spaced from the corresponding end of the preceding box-part, means for rendering the positioning means effective only upon the alternate delivery of the parts, and means movable in co-operation with the support for nesting the positioned parts.

26. In an apparatus for nesting box-parts, a support upon which the parts are delivered, means including a transversely movable member at said support for positioning the parts upon the support, electrical means including an alternating relay responsive to the delivery of box-parts for rendering the positioning means effective upon the delivery of alternate box-parts, and means movable in co-operation with the support for nesting the positioned parts.

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