March 17, 1936. H. T. McCLURE 2,034,408

MACHINE FOR FASTENING COVERS TO CONTAINERS

Filed July 1, 1933 3 Sheets-Sheet 1

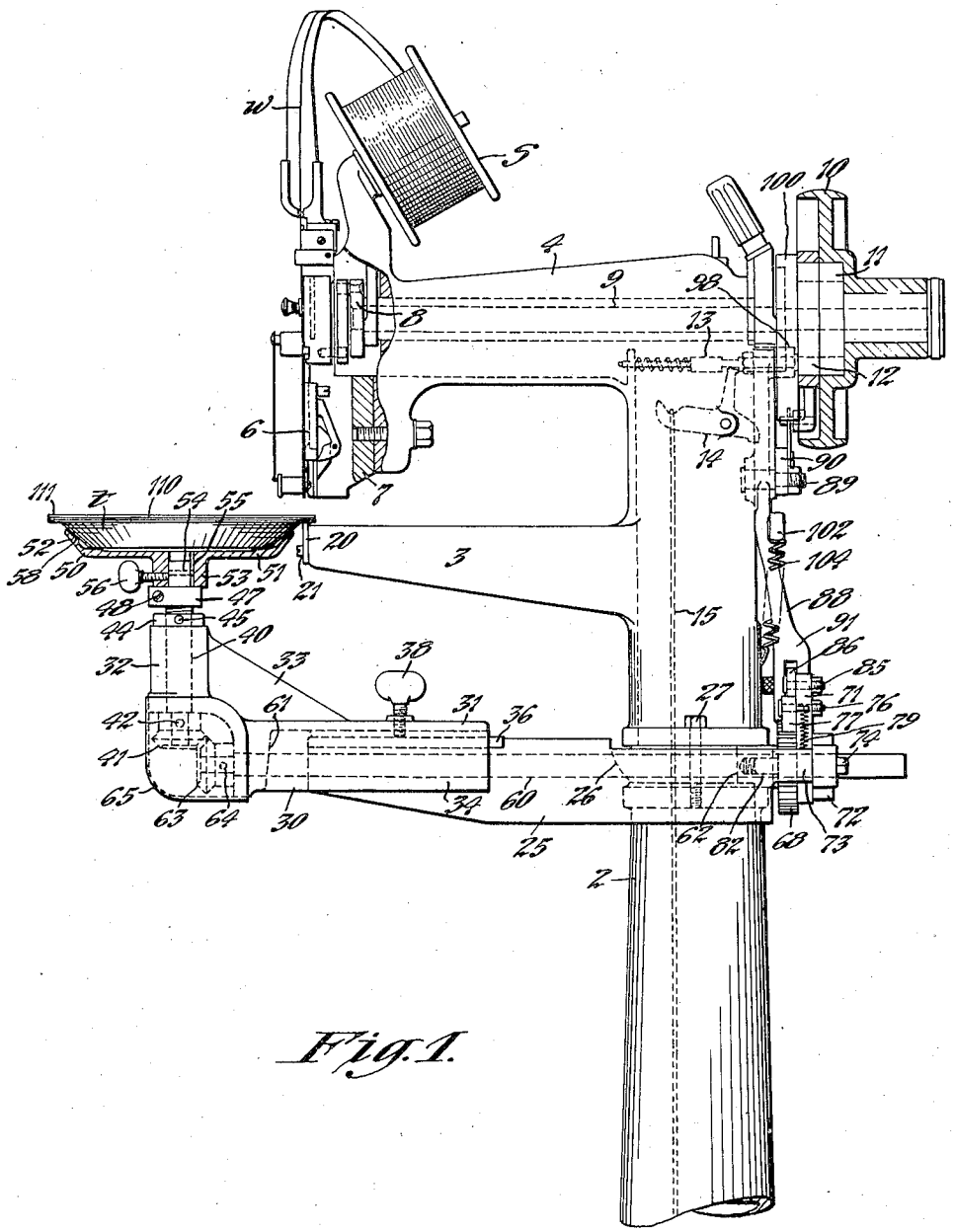


Fig. 1.

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Filed July 1, 1933 3 Sheets-Sheet 2

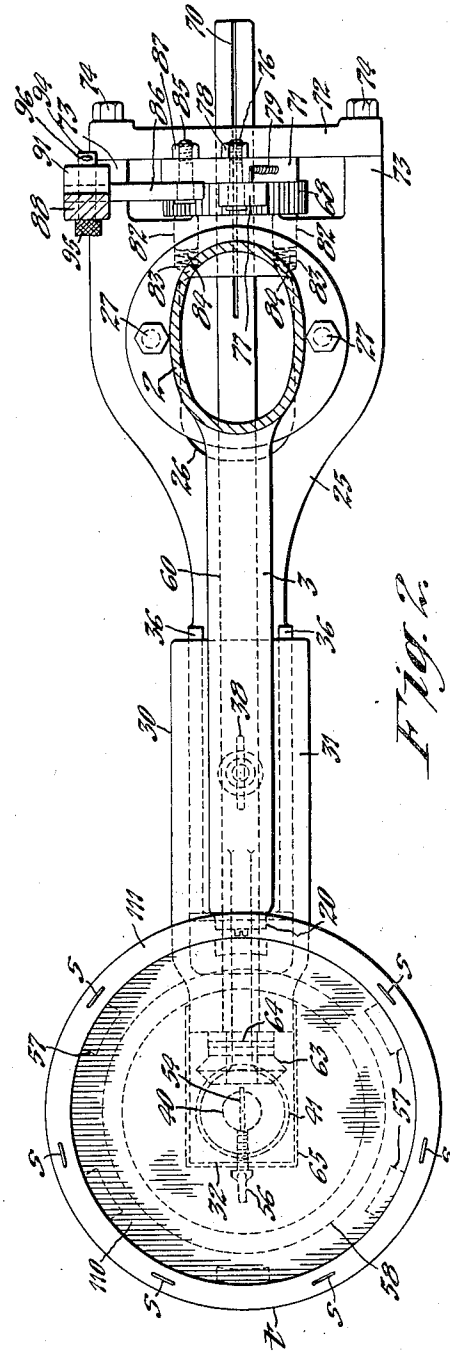


Fig. 2.

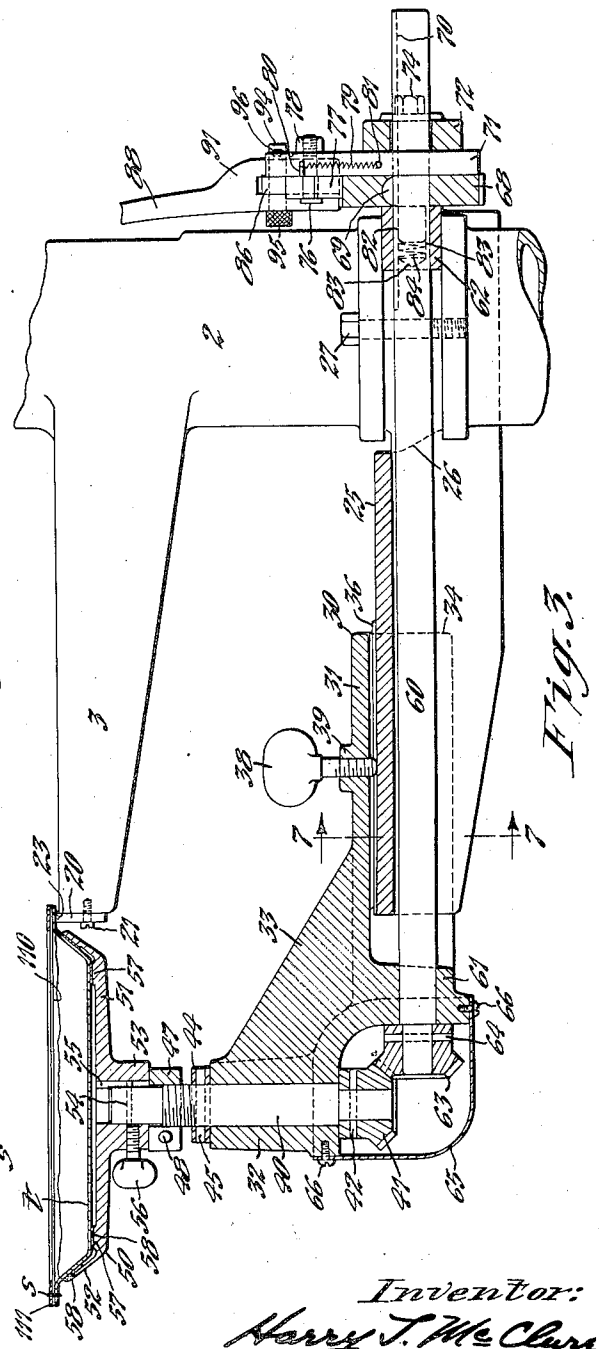


Fig. 3.

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March 17, 1936. H. T. McCLURE 2,034,408

MACHINE FOR FASTENING COVERS TO CONTAINERS

Filed July 1, 1933 3 Sheets-Sheet 3

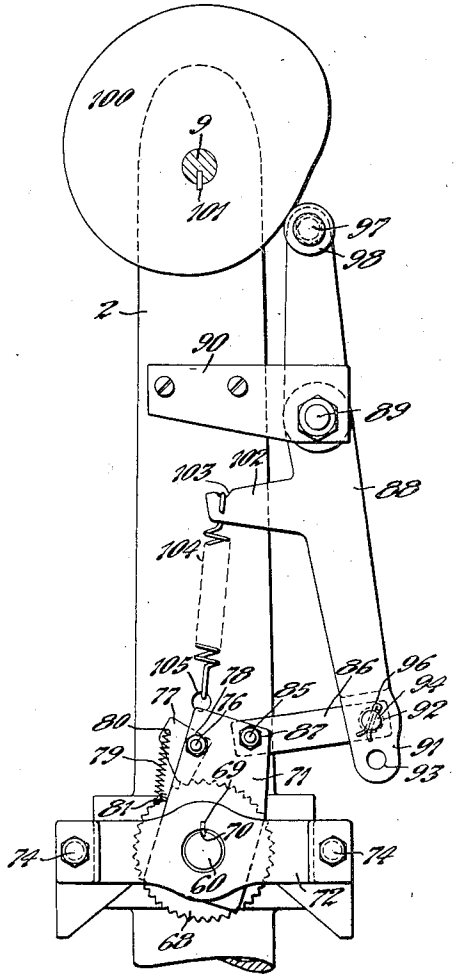


Fig. 4.

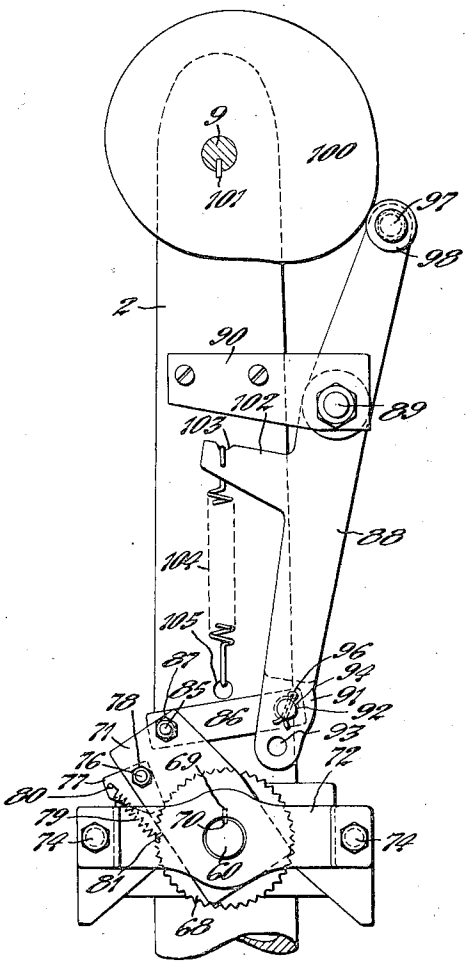


Fig. 5.

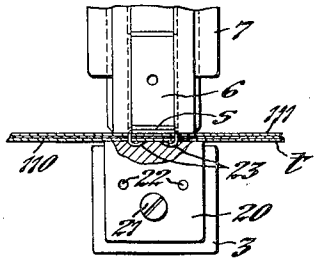


Fig. 6.

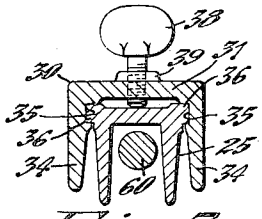


Fig. 7.

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Patented Mar. 17, 1936 2,034,408

UNITED STATES PATENT OFFICE

2,034,408

MACHINE FOR FASTENING COVERS TO CONTAINERS

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Application July 1, 1933, Serial No. 678,636

13 Claims. (Cl. 1—2)

This invention relates to stapling, wire-stitching or fastener-applying machines, and particularly to a machine for inserting staples or other types of fasteners through the rim of a container to fasten a cover thereto.

One object of the invention is to provide a fastener-applying machine for securing a cover of sheet material to the rim of a circular container, such as a pie-plate or the like, to seal the contents thereof.

Another object of the invention is to provide a machine of the type indicated having a rotatable work-support or turntable with means for automatically indexing it from the fastener-applying mechanism to synchronize its actuation therewith.

Another object of the invention is to provide a machine of the type indicated having a rotatable work-support and indexing means therefor which may be readily adjusted to adapt the support for holding containers of varying size and shape and to effect the proper spacing of the fasteners around the rim thereof.

Another object of the invention is to provide a work-support and indexing means therefor which may be applied to machines already in use without material alteration in construction thereof.

Another object of the invention is to provide a device of the type indicated which is simple in construction, durable in use and proof against derangement or getting out of order.

Further objects of the invention are set forth in the following specification which describes a preferred form of construction of the device, by way of example, as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a side elevation of a wire-stitching or stapling machine showing the present improved work-support and its indexing mechanism as applied to use therewith;

Fig. 2 is an enlarged plan view of the work-support and its indexing mechanism;

Fig. 3 is a sectional view of the same taken in a medial vertical plane;

Fig. 4 is an end view of the indexing mechanism showing the parts in neutral position;

Fig. 5 is a similar end view illustrating the position of the parts at the completion of the indexing operation;

Fig. 6 is a front view of a portion of the staple-driving means, showing a staple completely driven through the rim of the container and clinched on the under side thereof to secure the covering material thereto; and

Fig. 7 is a transverse sectional view of the supporting means for the work-holder taken on line 7—7 of Fig. 3.

In accordance with modern methods of packaging food-stuffs such as articles of pastry or the like, the goods are put up in plates or trays usually constructed from pressed paper or cardboard. For covering and sealing the contents of the containers from the atmosphere and to protect them from dust and dirt a suitable cover of wax paper or other transparent material such, for example, as that sold under the trade-mark "Cellophane", is fastened across the top of the plate or tray. The covering sheet is placed over the tray and fastened to the rim thereof, preferably by stitching or stapling it at a plurality of points thereabout. This method of packaging goods provides an extremely neat and sanitary container with the merchandise completely sealed and protected while being visible through the cover.

Due to the fact that goods of the present type are sold at a low price it is essential that the cost of packaging the merchandise be reduced to a minimum. To economize in the labor and cost of packaging the goods in the manner as above explained the present invention provides a machine embodying the following instrumentalities: a rotatable work-support or turntable for holding the container in position to receive the staples or other fasteners to be inserted through its rim; means for applying the fasteners and clinching them in place; and means for automatically indexing the work-support to successively present different portions of the container to the fastener-applying means to position the fasteners in spaced relationship around its rim.

Referring to Fig. 1 of the drawings, the stapling or stitching machine herein illustrated is of conventional type, being mounted upon a column or standard 2 rising from the floor and having a horizontal arm 3 projecting laterally therefrom to provide a rest or support for the staple-clinching means to be later described. Projecting laterally from the top of the column 2 is a second arm 4 on which the stapling or stitching mechanism is carried. The stitching mechanism may be of a known type such as shown in United States Letters Patent No. 1,252,011, dated January 1, 1918, in which the staples are preformed from wire and thereafter driven into the work.

The staple-inserting means consists in a driver 6 which is reciprocably mounted in a head 7 carried at the end of the arm 4. The driver 6 is operated from a crank-arm 8 fast on the forward end of a drive-shaft 9 extending longitudinally

through the arm 4. A belt-pulley 10, connected to a suitable source of power such as an electric motor, not herein shown, drives the shaft 9 through means of interengaging clutch members 11 and 12. The present form of clutch is shown and described in United States Letters Patent No. 1,495,342, dated May 27, 1924, and therefore will not be herein described in detail. Suffice it to state that the clutch is controlled by means of a spring-actuated plunger-rod 13 which is operated from a bell-crank lever 14. The lever 14 is connected by means of a link 15 to a foot-treadle, not herein shown, arranged at the base of the column 2. By depressing the treadle the plunger 13 is withdrawn from engagement with the clutch and the latter connected to drive the shaft 9 to actuate the staple-forming and -driving mechanisms. A braking device also shown and described in the patent last referred to, may be employed for promptly arresting the rotation of the shaft 9 when the clutch is disconnected.

At the forward end of the arm 3 is a clincher-block or anvil 20 which is secured thereagainst by a screw 21 and held from turning by means of dowel-pins 22, see Figs. 3 and 6. A pair of clincher-grooves 23 formed in the top surface of the anvil-block 20, as shown in Fig. 6, have their bottoms of arcuate contour to provide that when the staples *s* are driven through the work their legs will enter the grooves to be directed toward each other and bent upwardly to clinch them against the under side of the work.

The rotatable work-support and the automatic indexing means of the present invention are constructed and arranged as next described. It will be observed by reference to Figs. 1 and 3 of the drawings that the upright or column 2 of the machine is constructed in two alining sections bolted together at 27. Interposed between the two sections of the column 2 is a platform-member or arm 25 having an elongated opening 26 for accommodating the operating link 15, previously described, which extends down through the interior of the column. The two sections of the hollow column and the platform-member 25 are fastened together by means of the bolts 27 which pass through holes in a lateral flange on the upper section of the column with their ends screwed into threaded holes in a lateral flange on the lower section of the column.

The forward end of the platform 25 is reduced in width as shown in Fig. 2 to serve as a support for a bracket 30 slidably mounted thereon. As shown in Fig. 3, the bracket 30 is of elbow-shape having a horizontal arm 31 and a vertical arm 32 braced therefrom by a web 33. Referring particularly to Fig. 7, the horizontal arm 31 of the bracket 30 is of inverted U-shape being formed with a flat top and depending side-flanges 34. Formed in the inner sides of the flanges 34 are longitudinally-extending grooves 35 which are adapted to slidingly receive opposite lateral splines 36 on the sides of the platform 25, whereby the bracket 30 may be adjusted longitudinally of the platform. A thumb-screw 38 threaded through a boss 39 on the bracket 30 has its end engaged with the top of the platform to secure the bracket 30 in adjusted position thereon.

The vertical arm 32 of the bracket 30 is constructed as a bearing formed with a bore in which a shaft 40 is journaled. The shaft 40 is reduced at its lower end to receive a bevel-gear 41 pinned thereto at 42 or otherwise suitably fastened rotatively therewith. The upward thrust on the shaft 40 is taken by the hub of the gear 41, while a collar 44 secured to the shaft by a pin 45 and abutting the top of the bearing 32 takes the downward thrust thereon. Directly above the collar 44 the shaft 40 is threaded to receive an interiorly-threaded split-collar 47 which has a binder-screw 48 passing through its split portion to clamp it in place on the shaft. By loosening the screw 48 the collar 44 may be adjusted axially of the shaft 40 for a purpose as later explained.

The shaft 40 is reduced at its upper extremity to receive the work-support or turntable 50 which is provided with a hub 53 bored to fit the shaft. The work-support 50 may be constructed of any suitable shape and size in accordance with the character of the article to be supported thereon. As herein illustrated it takes the form of a relatively shallow dish-shaped holder having a circular base 51 bounded by an outwardly flaring rim 52 whereof it is adapted to receive a plate or tray *t* such as used for cakes or pies. The hub 53 of the work-support or turntable 50 seats against the collar 47 and is keyed rotatively with the shaft 40 by means of a pin 54 driven therethrough with its end engaging a splined groove 55 in the bore of the hub. To secure the turntable 50 from lifting on the shaft 40 a thumb-screw 56 is threaded through the side of the hub 53 with its end binding against the side of the shaft.

The turntable 50 may be adjusted vertically to locate the rim of the pie-plate or container *t* in proper relation to the clincher-block 20 by loosening the binder-screw 48 and thumb-screw 56 and turning the collar 47 to cause it to be raised or lowered on the shaft 40. After the correct adjustment has been obtained the binder-screw 48 is tightened to clamp the collar 47 in place and the thumb-screw 56 then tightened to secure the holder 50 from rising on the shaft 40.

The shaft 40 is rotated with a step-by-step motion to index the turntable 50 with respect to the fastener-applying mechanism by means as later described whereby to successively advance the rim of the container *t* to receive the staples in spaced relationship therearound as indicated in Fig. 2 of the drawings. To prevent relative movement or slippage between the turntable 50 and the container *t* a plurality of raised pads or bosses 57 are formed on the interior surface of the turntable to which are cemented strips 58 of cork or other friction material. The means for rotating and indexing the turntable 50 are constructed and arranged as next described.

Journaled in a bearing 61 depending from the bracket 30 and a spaced bearing 62 formed at the rearward end of the platform member 25 is a horizontal shaft 60. The forward end of the shaft 60 is reduced in diameter to receive a bevel-gear 63, pinned thereto at 64, which meshes with the bevel-gear 41 on the vertical shaft 40. A sheet-metal cover 65, secured to the front and bottom sides of the bracket 30 by means of screws 66, is provided for housing the gears 41 and 63. The rearward end of the shaft 60 projects beyond the end of the bearing 62 to adapt it to receive a ratchet-wheel 68 abutting the end of the bearing. The bore of the ratchet-wheel 68 is provided with a key 69 which engages an extended keyway 70 in the shaft 60 to adapt the shaft to slide through the wheel.

Abutting the outer face of the ratchet-wheel 68 is a pawl-arm 71 rockably mounted on the shaft 60. The ratchet-wheel 68 and pawl-arm 71 are held axially in place against the end of the bearing 62 by means of a cross-strip 72 hav-

ing a clearance hole through which the shaft **60** projects, the ends of the cross-strip being fastened to rearward projections **73** on the platform-member **25** by means of bolts **74**, see Figs. 2 and 4.

Pivoted on a stud **76** carried by the pawl-arm **71** is a pawl **77** adapted to engage successively with the teeth of the ratchet-wheel **68** to rotate the latter intermittently when the pawl-arm is rocked under the action of means as later described. As shown in Fig. 3, the stud **76** has an enlarged head abutting the side of the pawl **77** and a reduced threaded portion which projects through the pawl-arm **71** to receive a nut **78** screwed thereon to hold the stud in place. A spring **79**, connected at one end to a pin **80** on the pawl and anchored at its opposite end to a hook **81** carried by the pawl-arm **71**, acts to maintain the pawl in engagement with the teeth of the ratchet-wheel **68**. Means are provided for preventing retrogressive movement of the ratchet-wheel **68** during the return stroke of the pawl **77**, such means comprising a pair of plungers **82** slidably held in bores **83** in the rearward end of the platform-member **25** and engaging against the side of the ratchet-wheel to frictionally resist rotative movement thereof. As shown in Figs. 2 and 3, the plungers **82** are resiliently urged against the ratchet-wheel **68** by the tension of a pair of helical springs **84** pocketed in the bores **83** in which the plungers slide.

Pivotally mounted on a stud **85** passing through the pawl-arm **71** is a link **86**, the stud being fastened in place by means of a nut **87** screwed onto its end. The opposite end of the link **86** is hingedly connected to the lower arm of a cam-actuated lever **88** which is pivotally mounted on a stud **89** secured in a bracket **90** extending laterally from the upright or column **2** of the machine. As shown in Fig. 3 of the drawings, the lower end of the lever **88** is formed with a yoke **91** having two or more holes **92** and **93** drilled through its sides, see Fig. 4. The end of the link **86** is connected to a removable stud or pin **94** extending through a pair of the holes **92** or **93**, as the case may be. The head **95** of the pin **94** abuts the side of the yoke **90** and a cotter-pin **96** passing through the opposite end of the pin **94** prevents accidental withdrawal of the latter.

The upper arm of the lever **88** carries a stud **97** on which is rotatably mounted a roller **98** engaging against the periphery of a cam **100**. The cam **100** is keyed at **101** to the main drive-shaft **9** of the machine, being located between the drive-pulley **10** and the end of the arm **4**. Projecting laterally from the lever **88** is an arm **102** provided with a notch **103** for receiving the hooked end of a helical spring **104**; the opposite end of the spring **104** being hooked through a hole **105** in the side of the column **2** of the machine. The spring **104** acts on the lever **88** to maintain the roller **98** in engagement with the periphery of the cam **100**.

The construction and arrangement of the machine having now been described in detail its method of operation will next be explained: Fig. 1 illustrates the machine at rest with the stapling and work-support indexing mechanisms inactive and shows a pie-plate or other tray-like container *t* with its contents in place on the work-support or turntable **50**. Pies and similar articles of pastry are baked in different sizes varying from four to ten inches in diameter and of different depth and the present machine is adjustable in the manner as next explained to accommodate any particular size.

The present drawings illustrate a pie-plate or container of relatively large size in which seven staples are employed to secure the covering material **110** to its top. For a container of this size a suitable turntable or work-support **50** is first selected and fastened to the top of the shaft **40**. The work-support **50** is then adjusted vertically and horizontally to bring the projecting rim of the pie plate into position overlying the clincher-block **20** to adapt it to receive the staples *s* at the proper distance from its edge. The work-support **50** is adjusted vertically on the shaft **40** in the manner as previously explained and its horizontal adjustment is effected by loosening the thumb-screw **38** and sliding the bracket **30** along the platform-member **25** until the rim of the pie-plate *t* is properly positioned with respect to the clincher-block **20**. During the horizontal adjustment of the bracket **30** the shaft **60** slides through the rearward bearing **62** with the key **69** in the ratchet-wheel **68** sliding in the keyway **70** of the shaft so that these latter parts remain connected. After the desired horizontal adjustment of the work-support has been accomplished the thumb-screw **38** is again tightened to hold the bracket **30** in place.

With the container or plate *t* and its contents in place on the work-support **50** a circular sheet **110** of transparent material, such as wax paper or the like, is placed across the top of the plate and a pressed paper ring or annulus **111** positioned over its rim in the manner as illustrated in Figs. 2 and 3. With the container and its cover thus assembled on the work-support **50** the machine is started by depressing the foot-treadle to connect the clutch members **11** and **12**. The stapling mechanism of the machine is actuated from the shaft **9** to feed the wire *w* from the spool S; cut off a suitable length thereof; form the length into a staple; and finally drive the staple into the work. Referring particularly to Fig. 6 of the drawings, as the staple *s* is driven downwardly by the driver **6** its legs are pierced through the ring **111**, covering material **110** and the rim of the tray or plate *t*. The legs of the staple are thus caused to enter the clincher-grooves **23** in the clincher-block **20** to be bent to clinch them against the under side of the rim of the plate *t*.

At the completion of the stapling operation the driver **6** ascends into the stapling head **7** and during this operation the cam **100** is rotated to force the roller **98** outwardly to rock the lever **88** into the position as illustrated in Fig. 5. During this stroke of the lever **88** the lower end thereof is rocked to move the pawl **77** to advance the ratchet-wheel **68** in a counterclockwise direction, as viewed in Figs. 4 and 5, one-seventh of a complete revolution. The shaft **60** is turned with the ratchet-wheel **68** and since the bevel-gears **63** and **41** have the same number of teeth, the shaft **40** and its attached holder **50** are rotated through one-seventh of a complete revolution. As the pawl **77** reaches the end of its movement another staple *s* is driven through the rim of the container and clinched on the under side thereof to bind or stitch the covering **110** and the overlying rim **111** thereto. During the staple-driving operation the cam **100** turns to the position shown in Fig. 4 to permit the lever **88** to be rocked back to first position under the force of the spring **104**. The pawl **77** is thus carried back over the teeth of the ratchet-wheel **68** as retrogressive movement of the latter is prevented by the frictional resistance of the spring-pressed plungers **82**.

At the completion of the staple-driving operation the pawl **77** is again advanced by the rocking motion of the lever **88** under the action of the cam **100** to turn the shaft **60** and thereby the shaft **40** to again rotate the work-support through another seventh part of a revolution. This operation is repeated until seven staples have been inserted through the rim of the container in the manner as indicated in Fig. 2. The operator then releases the treadle and the drive-shaft **9** of the machine is automatically declutched and the brake applied to promptly arrest the operation of the machine. The packaged pie or other article is removed from the work-support **50** and another inserted in its place, after which the machine is again started to repeat the cycle of operations as explained. During the stapling of the cover to the plate or tray *t* the operator may assemble other packages for subsequent stapling operations. The improved machine thus makes for greater speed of operation and the cost of packaging the articles is reduced to a minimum.

When a relatively small package is to be stitched a lesser number of staples are driven through its rim. For example, small pie-plates or similar containers may require only six staples to secure the cover in place. To adjust the machine for applying this number of staples during one rotation of the container the pin **94** is removed from the upper hole **92** in the lever **88** and inserted into the lower hole **93** to pivotally connect the link at a greater distance from the pivot of the lever. With this latter adjustment the throw of the pawl-arm **71** is increased to provide for turning the shafts **60** and **40** through a greater part of a revolution. In this manner the container is advanced one-sixth of a revolution at each indexing of the work-support so that only six staples are applied around its rim.

It will be observed from the foregoing that the present invention provides an automatically operated machine for fastening covers to containers or for any work of like nature. The machine may be operated at a high rate of speed to economize in the cost of sealing the containers and it is thus of great advantage in the packaging of various kinds of merchandise.

Means are provided whereby the positioning of the fasteners around the container may be regulated in accordance with the size of the package and the number of fasteners required to properly seal the container.

The machine is convenient to operate, proof against derangement or getting out of order and functions to provide a much neater and more sightly closure for the container with a seal not liable to be released or broken.

While the invention is herein shown as embodied in a preferred form of construction, it is to be understood that various modifications may be made in the structure and arrangement of the parts of the machine without departing from the spirit or scope of the invention. Therefore, without limiting myself in this respect, I claim:

1. In a machine of the type indicated, the combination of fastener-applying means, a rotatable turntable for supporting a tray-like container, means for indexing the turntable to advance different portions of the rim of the container into position to receive the fasteners, and means for adjusting the position of the turntable both laterally and axially in relation to the fastener-applying means in accordance with different sizes and shapes of containers.

2. In a machine of the type indicated, the combination of fastener-applying means, a rotary turntable for supporting a tray-like container with its rim in position to receive the fasteners, means for intermittently rotating the turntable in timed relation to the fastener-applying means, and means for adjusing the turntable vertically and horizontally in relation to the fastener-applying means to accommodate different sizes and shapes of containers.

3. In a machine of the type indicated, the combination of fastener-applying means, clincher means arranged in cooperative relation to the fastener-applying means, a rotary turntable for supporting a container with its rim disposed between the fastener-applying means and clincher means, means for adjusting the turntable laterally with respect to the clincher means, and means for intermittently rotating the turntable to successively present different portions of the rim of the container to the fastener-applying means.

4. In a machine of the type indicated, the combination of a stapling head, stapling mechanism on said head, clincher means adapted to cooperate with the stapling mechanism, a support beneath the stapling head, a bracket adjustable horizontally on said support, a turntable rotatably supported on said bracket, means for adjusting the height of the turntable with respect to the clincher means, means for actuating the stapling means, and means for rotating the turn-table with a step-by-step motion in timed relation to the operation of the stapling mechanism.

5. In a machine of the type indicated, the combination of fastener-applying means, a support below said means, a bracket slidable on said support, means for securing the bracket in different positions of adjustment on said support, a turn-table rotatably mounted on the bracket, means for vertically adjusting the turntable on the bracket, driving means for actuating the fastener-applying means, and means connecting said driving means to rotate the turntable.

6. In a machine of the type indicated, the combination of a stapling head, a column supporting said head, an arm projecting from said column, clincher means on the arm in cooperative relation with the stapling head, a support on the column, a bracket slidable on said support, a vertical shaft journaled in said bracket, a horizontal shaft journaled in the bracket, gearing connecting said shafts, a turntable on the vertical shaft, a ratchet-wheel slidably keyed to the horizontal shaft to adapt the latter to be adjusted with the bracket, a drive-shaft for the stapling mechanism, and means actuated from said drive-shaft to intermittently advance the ratchet to rotate the turntable with a step-by-step motion in timed relation with the actuation of the stapling mechanism.

7. In a machine of the type indicated, the combination of fastener-applying means, a drive-shaft for actuating said means, clincher means for cooperating with the fastener-applying means, a bracket adjustable laterally of the clincher means, a vertical shaft journaled in said bracket, a turntable adjustable vertically of said last-named shaft, a horizontal shaft journaled in the bracket, gearing connecting the horizontal and vertical shafts, and means connecting the drive-shaft to intermittently turn the horizontal shaft to rotate the turntable with a step-by-step motion.

8. In a machine of the type indicated, the com-

bination of a stapling head embodying a staple-driver and means for forming wire staples to be driven by the staple-driver, a drive-shaft in said head for actuating said staple-driver and said staple-forming means, a rotary turntable, a driven shaft for rotating the turntable, gearing connecting said driven shaft with the turntable, a cam on the drive-shaft in the head, and ratchet-means actuated by said cam on the drive-shaft to intermittently rotate the driven shaft.

9. In a machine of the type indicated, a stapling head, a staple-driver in said head, clincher-means below said head, a driving shaft in said head for directly actuating the staple-driver, a work-support mounted for rotation in a horizontal plane to hold the edge of a tray-like container in position to be stapled between the head and clincher-means, a driven shaft extending at right-angles to the axis about which the work-support rotates, driving means connecting the driven shaft and work-support, and an oscillating lever pivoted intermediate its ends and directly actuated by the driving shaft for intermittently rotating the driven shaft.

10. In a machine of the type indicated, the combination of a stapling head, a staple-driver in said head, means in said head for feeding wire and forming staples to be driven by said staple-driver, a drive-shaft in the stapling head for directly actuating the feeding and forming means and staple-driver in sequential order, a turntable mounted for rotation in a horizontal plane to support a tray-like container and position its edge in association with the stapling head, a rotatable cam on said drive-shaft, and ratchet-means actuated by the cam to rotate the turntable with a step-by-step motion.

11. In a machine of the type indicated, the combination of a stapling head embodying a staple-driver and means for feeding and forming lengths of wire into staples to be driven by the staple-driver, a shaft in the head for intermittently actuating the feeding and forming means and staple-driver in sequential order, a work-supporting turntable rotatably mounted for movement in a horizontal plane, said turntable being adapted to support a tray-like container to position its edge below the stapling head, a shaft for rotating the turntable, said shaft extending at an angle to the axis of rotation of the turntable, driving means connecting the shaft with the turntable, a cam on the shaft in the stapling head, and means actuated by the cam to intermittently drive the second shaft to rotate the turntable with a step-by-step motion in timed relation to the actuation of the staple-driver.

12. In a machine of the type indicated the combination of a stapling head embodying a staple-driver and means for forming wire staples to be driven by the staple-driver, a drive-shaft in the head for actuating the staple-forming means and staple-driver, a work-supporting turntable mounted for rotation in a horizontal plane, a driven shaft extending at right-angles to the axis of the turntable, driving means connecting the driven shaft and turntable, a cam on the drive-shaft, a pivoted lever actuated by the cam, and ratchet-means actuated by the lever to intermittently rotate the driven shaft and turntable.

13. In a machine of the type indicated, the combination of a stapling head, a staple-driver in said head, means for feeding and forming lengths of wire into staples to be driven by the staple-driver, a drive-shaft in the head for actuating the feeding and forming means and staple-driver in sequential order, a work-supporting turntable mounted for rotation in a horizontal plane, a driven shaft for rotating the turntable, gearing connecting the driven shaft and turntable, a ratchet-wheel on the driven shaft, a rockable arm, a pawl on said arm engaging the teeth of the ratchet-wheel, and a cam on the drive-shaft in the head engaging the arm to intermittently actuate the ratchet-wheel whereby to rotate the turntable with a step-by-step motion.

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