

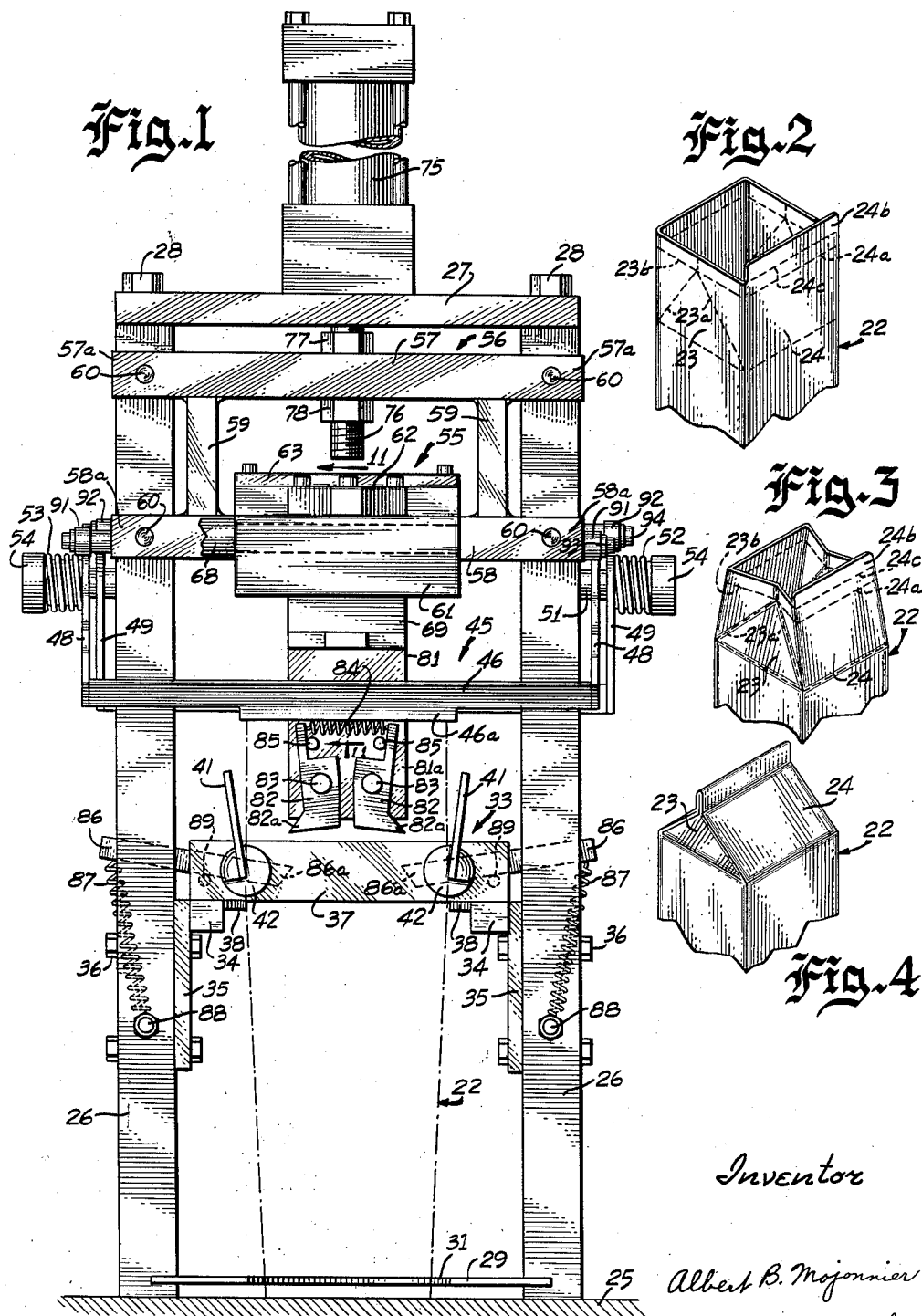
July 9, 1957

A. B. MOJONNIER
CARTON SEALING MECHANISM

2,798,349

Filed Nov. 2, 1955

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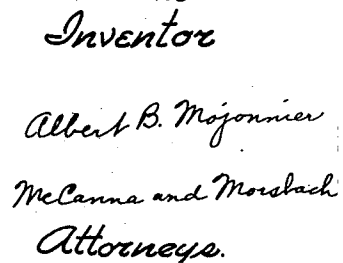
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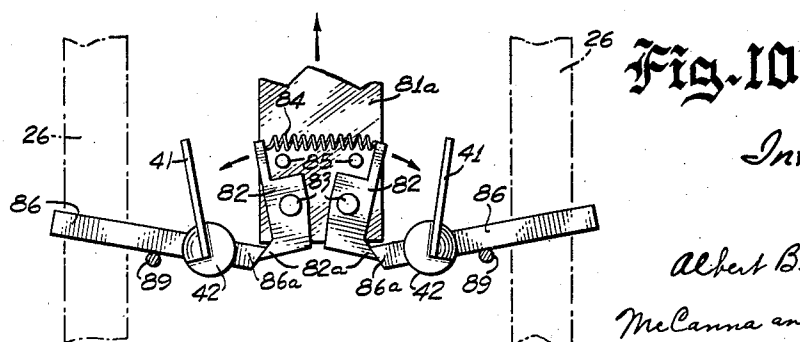
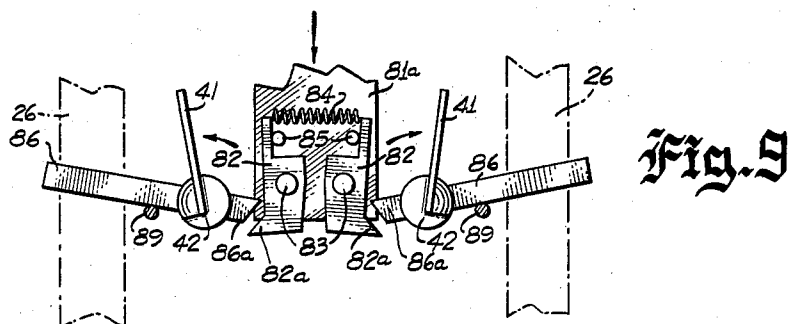
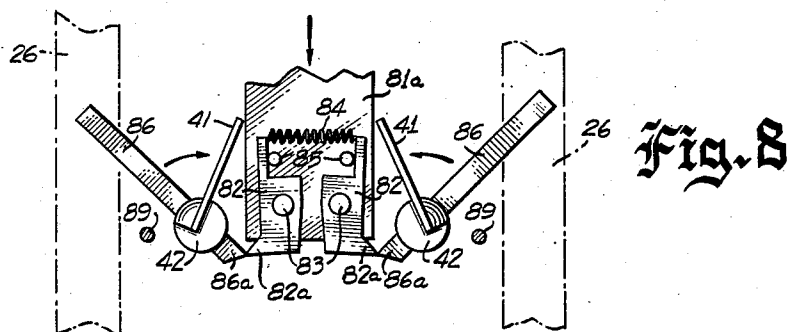
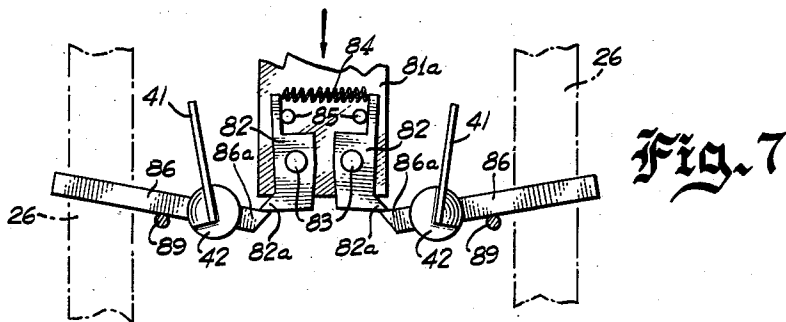
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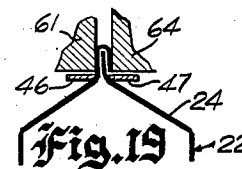
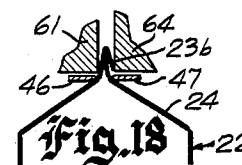
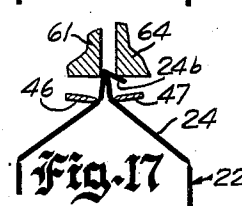
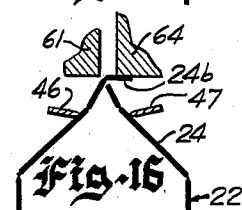
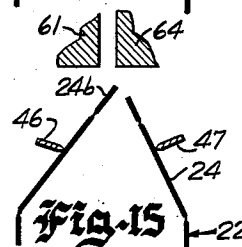
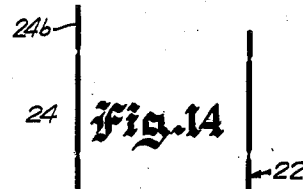
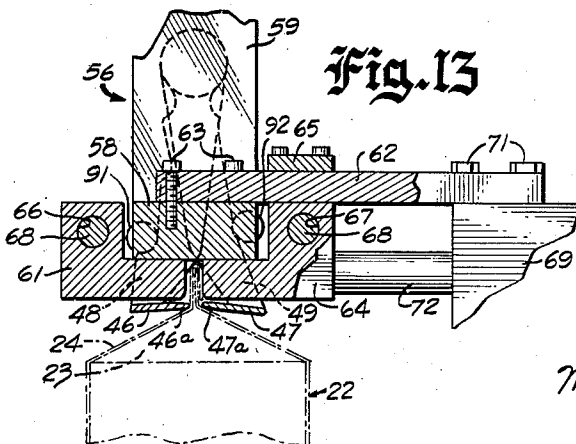
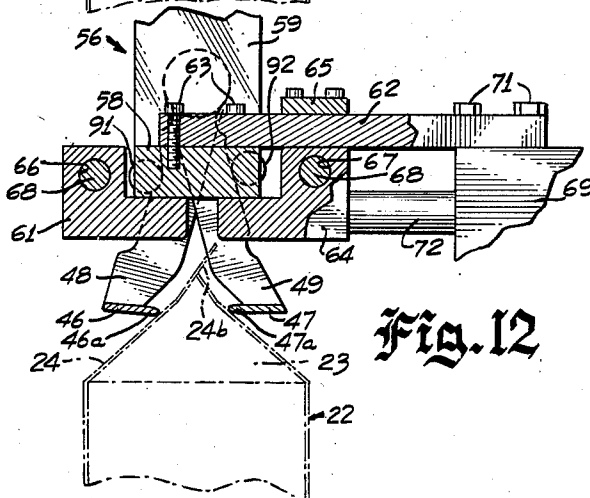
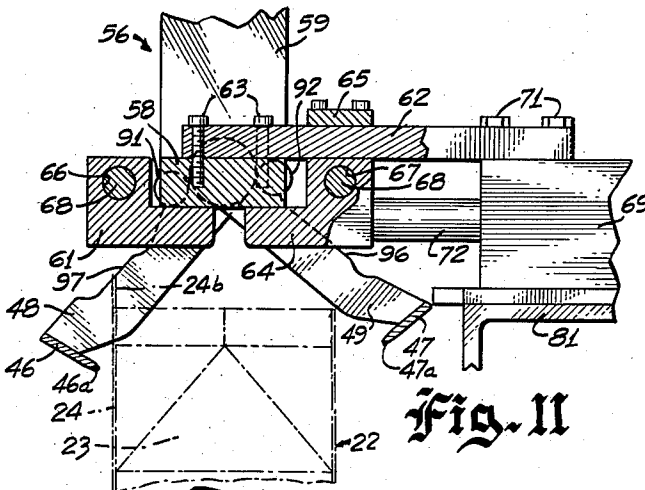
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2,798,349

CARTON SEALING MECHANISM

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Application November 2, 1955, Serial No. 544,444

10 Claims. (Cl. 53—373)

This invention relates to novel and useful improvements in machines for folding and sealing flexible liquid containers of the type having an upper end portion adapted to be folded to form a gabled top on the container.

Flexible containers formed of cardboard or the like and having a foldable upper end portion arranged to form a gabled top are in common use in packaging milk. In general, the containers are partially formed, prior to filling, into open top receptacles. The upper end portion of the container is creased along preselected fold lines to form opposed collapsible end panels and opposed foldable end panels adapted to be folded against the collapsible end panels to form a gabled top. A closure flap is formed on one of the foldable end panels and arranged to be folded upon the other of the foldable panels to seal the top of the container when the latter is closed.

In the prior machines for folding and sealing such containers, the container is sequentially moved from a station at which the collapsible end panels are tucked inwardly and the foldable panels partially folded; through a flap folding mechanism in which the foldable panels are moved together and the closure flap folded over onto the opposite foldable panel; to a sealing station wherein the foldable panels and closure flap are pressed together to seal the top of the container. Such machines require a conveyer to move the container between successive stations, which conveyer must be operated in timed relation with the operation of the folding and sealing mechanism. This arrangement of the folding and sealing mechanism at separate stations necessitates a relatively large machine somewhat complicated by the use of a conveyer for moving and accurately positioning the container at the several stations.

An important object of this invention is to provide a machine which is arranged to effect the entire operation of folding and sealing a gabled top container at one station to thereby provide a compact arrangement requiring little floor space.

A more particular object of this invention is to provide a folding and sealing mechanism for gabled top containers which is arranged to tuck the collapsible panels inwardly; fold the sides together; fold the closure flap onto the other foldable side and seal the container in a continuous sequence of operations while the container remains stationary.

Another object of this invention is to provide a folding and sealing mechanism for gabled top containers including a pair of sealing jaws mounted for vertical movement into and out of sealing position adjacent the upper end of the container and mechanism operated in response to the movement of the jaws downwardly into sealing position to tuck the collapsible panels inwardly and fold the foldable panels together in proper sequence.

Still another object of this invention is to provide a folding and sealing mechanism, in accordance with the foregoing object, in which the movement of the mechanism for folding the foldable panels inwardly and the

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downward movement of the movable jaws is correlated so that the jaws engage the closure flap on the container and fold it over as the jaws are moved into sealing position.

A further object of this invention is to provide a folding and sealing mechanism having an hydraulic operator for lowering and raising the sealing jaws into and out of operative position adjacent the top of the container and a second hydraulic operator for moving the jaws together to seal the container, together with a simple control arranged to sequentially actuate the hydraulic operator to move the jaws together in a sealing operation after the jaws have been lowered into proper position relative to the container.

These, together with various ancillary objects and advantages of this invention will be more readily appreciated as the same becomes better understood by reference to the following detailed description when taken in connection with the accompanying drawings wherein:

Figure 1 is a front elevational view of the closing and sealing mechanism;

Fig. 2 is a fragmentary perspective view of a container with the upper end portion open;

Fig. 3 is a fragmentary perspective view of the container with the upper end portion partially folded;

Fig. 4 is a fragmentary perspective view of the container having the upper end portion folded and sealed;

Fig. 5 is a side elevational view of the folding and sealing mechanism;

Fig. 6 is a horizontal sectional view taken on the plane 6—6 of Fig. 5;

Figs. 7—10 are fragmentary front elevational views of the tucker mechanism showing the latter in various operative positions;

Figs. 11, 12 and 13 are fragmentary vertical sectional views taken on the plane 11—11 of Fig. 1 and showing the carton folding mechanism in different operative positions;

Figs. 14—19 are fragmentary schematic views illustrating the foldable panels of the container at different stages of the folding and sealing operations; and

Fig. 20 is a diagrammatic view of the hydraulic system for operating the folding and sealing mechanism.

The apparatus of the present invention is arranged to fold and seal containers 22 formed of cardboard and the like and hereinafter referred to as cartons. The cartons are of the type having a generally rectangular cross section adjacent the upper end thereof and having an upper end portion adapted to be folded to form a gabled top on the container.

In general, opposed end panels 23 are formed with diagonal fold lines 23a and a horizontally extending fold line 23b spaced from the upper edge of the panel 23. The other opposed panels 24 are formed with horizontally extending fold lines 24a spaced on the upper edge thereof and a closure flap 24b is formed on one of the panels 24. A fold line 24c is formed at the juncture of the closure flap with the panel 24 to facilitate folding of the flap over the other foldable panel 24, when the top is closed. In this manner the upper end portion of the carton is provided with opposed collapsible end panels 23, opposed foldable panels 24 and a closure flap 24b so arranged as to be folded to form a gabled top structure as shown in Fig. 4.

The folding and sealing mechanism of the present invention is adapted for use with any conventional filling mechanism which will dispense the desired quantity of liquid into the container. The folding and sealing mechanism is mounted on a support such as a table 25 and includes a pair of spaced upright posts 26 having a cross bar 27 secured to the upper ends as by fasteners 28. A

guide plate 29 having a U-shaped opening 31 therein is mounted adjacent the lower end of the container 22 to locate the container in proper position with respect to the tucking and folding instrumentalities.

The tucker mechanism designated generally by the numeral 33 is mounted on the posts 26, above the table 25. The tucker mechanism includes a pair of bars 34 each attached to a bracket 35 and secured to the posts 26 by means of fasteners 36. The bars 34 extend in a direction transverse the plane of the posts 26 and have a cross member 37 rigidly secured thereto adjacent the rear ends thereof. Carton guide plates 38 are secured to the bars 34 and extend inwardly therefrom to guide the upper end container as it is positioned in the U-shaped opening 31. A pair of substantially triangularly shaped tucker blades 41 are secured to trunnions 42, which trunnions are rotatably journaled in the cross member 37 for movement about an axis perpendicular to the plane of the posts 26. The tucker blades 41 normally extend upright as shown in Figs. 1 and 5, and are operated by a mechanism described more fully hereinafter which swings the tucker blades inwardly into engagement with the collapsible panels 23 on the container to thereby tuck the latter inwardly as shown in Fig. 3.

The foldable sides 24 of the carton are folded inwardly by a folding mechanism designated generally by the numeral 45. The folding mechanism includes front and rear folding bars 46 and 47 extending parallel to the plane of the posts 26 and on opposite sides thereof. The folding bars 46 and 47 are respectively attached, at the ends thereof, to the forward and rear pairs of folding bar arms 48 and 49, respectively, which arms are swingably supported on pins 51 carried by the posts. The folding bars 46 and 47 are respectively formed with tongues 46a and 47a intermediate the ends thereof adapted to engage the foldable panels 24 on the container as the bars are swung inwardly. Coil springs 52 and 53 are mounted on the pivot pins 51 and each have one end thereof rigidly attached to collars 54 nonrotatably affixed to the pins 51. The other ends of the springs 52 and 53 are respectively secured to one of the forward and rear pairs of folding bar arms 49 and 48 to yieldably urge the folding bars to their spread positions shown in Figs. 1 and 5. The folding bars are moved inwardly into engagement with the carton, in timed relation with the operation of the tucker mechanism, in a manner described more fully hereinafter.

A sealing mechanism, designated generally by the numeral 55 is mounted on a carriage 56 for movement into and out of operative position adjacent the top of the carton 32. The carriage includes spaced frame members 57 and 58 having bifurcated end portions 57a and 58a respectively adapted to slidably engage the ports 26. Conveniently, a plurality of pads 60 are mounted on the bifurcated ends of the frame members to slidably support the latter on the posts. As shown in Fig. 1, the frame members 57 and 58 are rigidly interconnected by cross pieces 59. The sealing mechanism 55 is mounted on the lower frame member 58 and includes a generally L-shaped fixed sealing jaw 61 which is rigidly secured to the lower frame member 58. A slide bar 62 is attached by fasteners 63 to the lower frame member 58 and extends rearwardly therefrom. A generally L-shaped movable jaw member 64 is slidably mounted on the slide bar 62 and retained in position thereon by means of a cross piece 65 which overlies the bar 62. For reasons set forth more fully hereinafter, bores 66 and 67 are formed in the jaws 61 and 62 respectively for the reception of heating elements 68. An hydraulic operator is provided for moving the jaw 64 toward and away from the fixed jaw 61 and includes a cylinder block 69 secured to the rear end of the slide bar 62 by fasteners 71. A piston rod 72 is secured to the movable jaw 64 to slide the latter towards and away from the fixed jaw in response to the application of fluid pressure through the piston through fitting 73.

The carriage 56 and the attached sealing mechanism 55

is selectively raised and lowered by means of an hydraulic operator 75 having a piston rod 76 slidably extending through the cross bar 27 at the upper ends of the posts and rigidly secured to the upper frame member 57 by means of nuts 77 and 78. Fluid is selectively introduced and withdrawn from the operator 75 through a fitting 79 by a control apparatus to be described more fully hereinafter.

The folding and sealing mechanism is arranged so that the tucker blades 41 and the folding bars 46 and 47 are respectively moved inwardly towards each other in proper time sequence to tuck the collapsible end panels of the carton inwardly and fold the foldable panels together as the carriage 56 moves downwardly. For this purpose, an L-shaped bracket 81 is attached to the cylinder block 69 and has a leg 81a depending therefrom. A pair of dogs 82 having nose portions 82a are pivotally mounted by pins 83 on the depending leg of the bracket 81. A spring 84 is attached to the upper ends of the dogs to yieldably urge the nose portions apart and stop pins 85 are provided on the legs 81a to limit outward swinging movement of the nose portions of the dogs. The dogs 82 are arranged to engage the nose portion 86a of the tucker blade operating arms 86 to cam operate the tucker blades toward each other as the carriage is lowered. The arms 86 are rigidly secured to the ends of the trunnions 42 and have springs 87 secured to the outer ends thereof. The springs 87, as best shown in Figs. 1 and 5, are otherwise attached to a pin 88 carried by the posts 26 to yieldably urge the tucker blades 41 to their open position. Stop pins 89 are mounted on the cross member 37 and positioned to engage the arms 86 to limit outward swinging movement of the tucker blades 41.

The operation of the tucker mechanism is illustrated in Figs. 7-10. As the carriage 56 moves downwardly, the nose portions 82a on the dogs 82 engage the nose portions 86a on the arms 86, as shown in Fig. 7 and cause the tucker blades 41 to swing inwardly toward each other as shown in Fig. 8 into engagement with the collapsible panels 23a on the carton. As the carriage moves downwardly, the dogs ride over the nose portions 86a on the arms 86 and further downward movement of the carriage permits the arms 86 to be released to return to their normal position as shown in Fig. 9 under the bias of springs 87. When the carriage is subsequently raised, after the completion of the sealing operation, the nose portions 82a of the dogs 82 cam against the nose portions 86a of the arms 86, as shown in Fig. 10, and cause pivotal movement of the dogs relative to each other and against the bias of spring 84 until the dogs again clear the arms 86.

The folding bars 46 and 47 are moved toward each other into engagement with the foldable end panels 24 on the carton in response to lowering of the carriage 56. For this purpose there are provided a pair of rollers 91 and 92 mounted by pins 93 and 94 on the lower frame member 58 and respectively engageable with the forward folding bar arms 48 and the rear folding bar arms 49. The rollers 91 and 92 engage the upper edges of the forward and rear folding bar arms, as the carriage is lowered, and cause the arms to move towards each other from the solid line position shown in Fig. 5 to the dotted line position shown thereat.

In accordance with the present invention, the operation of the folding bars is correlated with the lowering of the fixed and movable jaws 61 and 64 so that lowering of the latter effects folding of the closure flap 24b on the carton over onto the other foldable panel. In the form of the invention shown, the folding and sealing apparatus is arranged to receive a carton 32 oriented so that the closure flap 24b is located at the front side of the folding machine. As best shown in Figs. 5 and 11-13 the rear folding bar arm 49 is formed with a substantially straight cam track 96 on its upper edge and has a well 96a adjacent the point where the roller 92 initially engages the arms 49. A lobe 96b is provided between the well 96a

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and the straight portion of the cam track to effect an initial relatively rapid movement of the folding bar 47 inwardly into engagement with the foldable panels 24 of the carton. The forward folding bar arm 48 is formed with a cam track on its upper edge having a straight portion 97, and a well 97a adjacent the point where the roller 91 initially engages the arm 48. A lobe portion 97b is formed adjacent the well 97a, which lobe portion 97b is relatively higher than the corresponding lobe 96b on the rear arm 49 whereby the forward arm is initially moved inwardly at a relatively more rapid rate than the rear arm so that the forward foldable panel 24 moves inwardly a distance sufficient to move the closure flap 24b below the rear jaw 64 of the sealing mechanism. A dwell portion 97c is formed between the lobe 97b and the straight portion 97 on the forward arm 48 and is so arranged that after the roller 91 passes over the lobe 97b, inward movement of the forward arm is substantially stopped until the roller passes onto the straight portion 97 of the track.

As the carriage 56 is moved downwardly, the rollers 91 and 92 respectively engage the arms 48 and 49, as shown in Fig. 11. The rollers 91 and 92 respectively pass over lobes 97b and 96b on the arms 48 and 49 to move the folding bars rapidly into engagement with the foldable panels 24 on the carton. As previously described, the lobe 97b is arranged so that the forward folding bar 46 is initially moved inwardly more rapidly than the rear folding bar 47 whereby the forward foldable panel 24 is rapidly moved to a position such as shown in Fig. 15 wherein the closure flap 24b thereon underlies the movable jaw 64. Continued downward movement of the carriage causes the forward roller 91 to pass along the dwell 97c on the forward arm and the roller 92 to pass along the straight portion 96 on the rear arm so that, when the carriage is in the position shown in Fig. 12, the folding bars 46 and 47 are approximately equally spaced from the centerline of the container. In this position, the closure flap 24b on the front foldable panel of the carton is engaged by the rear movable jaw 64 of the sealing mechanism and the latter deflects the foldable portion downwardly, as best shown in Fig. 16. As the carriage moves further downward, the roller 91 passes from the dwell 97c onto the straight portion 97 of the cam track on the forward arm while the rear roller 92 passes along the straight portion 96 of the cam track on the rear arm. The forward folding bar 46 is therefore moved more rapidly than the rear folding bar to depress the forward foldable panel 24 downwardly until the closure flap 24 abuts the upper edge of the rear foldable panel on the carton, as shown in Fig. 17. Further downward movement of the carriage, to the position shown in Fig. 13 moves both of the folding bars 46 and 47 towards each other to firmly press the foldable panels 24 of the cartons together. At this point, the sealing mechanism is operated to move the rear jaw 64 forwardly to compress the foldable panels and closure flap together and seal the carton as diagrammatically shown in Fig. 19.

Any suitable apparatus may be provided for controlling the application of fluid pressure to the hydraulic operator 75 for raising and lowering the carriage and to the hydraulic operator 69 for moving the jaws relative to each other to effect sealing of the carton. An hydraulic pump 101 is shown in Fig. 20 and includes a manually operable lever 102 adapted, when depressed, to apply pressure through a check valve 103 and conduit 104 to the hydraulic operator 75 to urge the carriage 56 to its lowered position. Alternately, a suitable power operated mechanism may be provided. Conveniently, fluid under pressure is applied to the hydraulic operator 69 for the jaws through an adjustable valve 105 which is arranged to open when the pressure in the conduit 104 reaches a predetermined value. The fluid passed by the valve 105 flows through conduit 106 to the jaw operator 69. Thus, when the operating lever is depressed, fluid under

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pressure is applied through conduit 104 to the operator 75 which effects lowering of the carriage. When the latter has moved downwardly to the position shown in Fig. 13, the fluid pressure required to further move the carriage is increased. The valve 105 is adjusted to pass fluid therethrough when the aforementioned pressure increase is reached. Fluid is therefore passed to the operator 69 to effect closing of the jaws 61 and 64 to seal the carton. The check valve 103 maintains the pressure in the conduit 104 and a conduit 107 is arranged to by-pass valve 105 and is operatively connected to the check valve so that the fluid under pressure in the conduit 107 and in conduit 104 may be released by operation of the release lever 108. In this manner, fluid under pressure is sequentially applied to the operator 75 to lower the carriage and then applied to the operator 69 to move the jaws and effect sealing.

From the foregoing it is thought that the operation of the device will be readily understood. The container 22, after being filled to a preselected level by a filling mechanism (not shown) is positioned within the U-shaped opening 31 in the guide 29 and between the guide blades 38 with the closure flap 24b on the carton located at the front side of the folding and sealing mechanism, as shown in Fig. 5. The operating lever 102 of the hydraulic pump 101 is then depressed to apply fluid pressure to the operator 75 and effect lowering of the carriage. As the carriage is lowered, the nose portions 82a on the dogs 82 initially engage the nose portions 86a on the arms 86 to swing the tucking blades 41 inwardly to the position shown in Fig. 8. This deflects the collapsible panels 23 on the container inwardly, as shown in Fig. 3. Before the dogs 82 ride over the nose portions 86a on the arms 86, the rollers 91 and 92 engage the cam tracks on the upper edges of the forward and rear folding bar arms 48 and 49. The arms move inwardly to engage the foldable panels 24 on the carton to deflect the latter inwardly before the collapsible panels 23 are released. Further downward movement of the carriage causes the dogs 82 to pass over the nose portions 86a on the arms 86 whereby the blades 41 move outwardly under the bias of spring 87. The rollers continue downward movement along the arms 48 and 49 and move the foldable panels on the carton inwardly. As previously described, the front foldable panel 24 is initially moved inwardly at a relatively more rapid rate than the rear panel so that the closure flap 24b thereon is moved to a position underlying the rear sealing jaw 64. Further downward movement of the carriage causes the folding bars 46 and 47 to move together to the position shown in Fig. 12. As the roller 91 rides out of the dwell 97c, the front folding bar 46 is again moved in relatively more rapidly than the rear folding bar to swing the front panel 24 of the carton downwardly until the closure flap thereon abuts the upper edge of the rear foldable panel. Simultaneously, the rear sealing jaw 64 engages the closure flap 24b and depresses the latter to the position shown in Fig. 18 so that the latter is folded over on the opposite foldable panel. When the carriage reaches its lowermost position shown in Fig. 13, the folding bars are moved into closely spaced adjacency to press the foldable panels together. This stops downward movement of the carriage and causes a rapid build up in the pressure in conduit 104. Valve 105 then opens to pass fluid to the jaw operator 69. The latter is operated to move the jaw 64 and compress and seal the open end of the carton. Upon release of the pressure in the hydraulic circuit, in response to operation of the pressure release lever 108, the movable jaw and the carriage return to their normal position ready for a subsequent operation. The jaws 61 and 64 are heated by the heating element 68 to melt the heat sensitive coating on the carton and seal the latter.

I claim:

1. An apparatus for folding and sealing cartons of the

type having a foldable upper end portion including opposed collapsible panels, opposed foldable panels and a closure flap on one of the foldable panels, said apparatus comprising a pair of tucking blades mounted for movement about spaced parallel axes, a pair of folding bars extending transverse to said blades on opposite ends thereof, arms attached to said blades and mounted for swinging movement about an axis perpendicular to the axes of movement of said blades, means on said carriage engageable with said arms as the carriage is moved downwardly for swinging the folding bars toward each other to fold the foldable panels on the carton, means responsive to downward movement of the carriage for swinging the tucking blades inwardly to tuck the collapsible panels, opposed sealing jaws mounted on said carriage for movement therewith into sealing position at opposite sides of said foldable panels, means for lowering and raising the carriage, and means for moving the sealing jaws relative to each other to press and seal the top of the carton therebetween.

2. The combination of claim 1 wherein said means for moving the tucking blades includes an operating arm on each of said blades, and means on said carriage engageable with said arms to swing the blades inwardly as the carriage moves downwardly.

3. An apparatus for folding and sealing cartons of the type having a foldable upper end portion including opposed collapsible panels, opposed foldable panels and a closure flap on one of the foldable panels, said apparatus comprising a pair of tucking blades mounted for swinging movement about spaced parallel axes and adapted to engage said collapsible panels to tuck the latter inwardly, folding means including a pair of folding bars operable to engage said foldable panels on the carton to fold the latter together, a carriage mounted for vertical sliding movement from a raised position above said blades to a lowered position, means on said carriage operative in response to movement of said carriage from said raised position to said lowered position for swinging said blades inwardly during the initial downward movement of the carriage and for thereafter swinging the blades outwardly as the carriage completes its movement to its lowered position, means for operating said folding means in timed relation to the operation of said carriage, opposed sealing jaws mounted on said carriage for movement therewith, means for raising and lowering said carriage, and means for operating said sealing jaws in timed relation with the raising and lowering of said carriage.

4. An apparatus for folding and sealing cartons of the type having a foldable end portion including opposed collapsible panels, opposed foldable panels and a closure flap on one of the foldable panels, said apparatus comprising a pair of tucking blades mounted for swinging movement about spaced parallel axes and adapted to engage the collapsible panels on the carton to tuck the latter inwardly, folding means including a pair of folding bars, arms attached to said bars and swingably supported for movement about an axis perpendicular to the axes of movement of said blades and parallel to the plane defined thereby, a carriage mounted for vertical reciprocation from a raised position above said blades to a lowered position, means on said carriage operative in response to movement of said carriage from said raised position toward said lowered position for swinging said blades inwardly during the initial downward movement of the carriage and for thereafter swinging the blades outwardly as the carriage moves to its lowered position, and means on said carriage engageable with said arms for swinging the folding bars together as the carriage moves downwardly to thereby fold the foldable sides together.

5. An apparatus for folding and sealing cartons of the type having a foldable end portion including opposed collapsible panels, opposed foldable panels and a closure flap on one of the foldable panels, said apparatus comprising a pair of tucking blades mounted for swinging

movement about spaced parallel axes and adapted to engage the collapsible panels on the carton to tuck the latter inwardly, folding means including a pair of folding bars, arms attached to said bars and swingably supported for movement about an axis perpendicular to the axes of movement of said blades and parallel to the plane defined thereby, a carriage mounted for vertical reciprocation from a raised position above said blades to a lowered position, means on said carriage operative in response to movement of said carriage from said raised position toward said lowered position for swinging said blades inwardly during the initial downward movement of the carriage and for thereafter swinging the blades outwardly as the carriage moves to its lowered position, means on said carriage engageable with said arms for swinging the folding bars together as the carriage moves downwardly to thereby fold the foldable sides together, a pair of sealing jaws on said carriage mounted for movement therewith into sealing position at opposite sides of said foldable panels when the latter are folded together, means for lowering said carriage, and means for operating said jaws to press and seal the carton top therebetween in timed relation with the operation of said carriage.

6. An apparatus for folding and sealing cartons of the type having a foldable end portion including opposed collapsible panels, opposed foldable panels and a closure flap on one of the foldable panels, said apparatus comprising a pair of tucking blades mounted for swinging movement about spaced parallel axes and adapted to engage the collapsible panels on the carton to tuck the latter inwardly, folding means including a pair of folding bars, arms attached to said bars and swingably supported for movement about an axis perpendicular to the axes of movement of said blades and parallel to the plane defined thereby, a carriage mounted for vertical reciprocation from a raised position above said blades to a lowered position, means on said carriage operative in response to movement of said carriage from said raised position toward said lowered position for swinging said blades inwardly during the initial downward movement of the carriage and for thereafter swinging the blades outwardly as the carriage moves to its lowered position, means on said carriage engageable with said arms for swinging the folding bars together as the carriage moves downwardly to thereby fold the foldable sides together, a pair of sealing jaws mounted on said carriage for movement therewith, said jaws being normally spaced apart and arranged to engage the closure flap on one end panel as the carriage is lowered to fold the flap over onto the opposite end panel, means for raising and lowering the carriage, and means for operating said jaws in timed relation with the raising and lowering of said carriage to seal the top of the carton.

7. An apparatus for folding and sealing cartons of the type having a foldable end portion including opposed collapsible panels, opposed foldable panels and a closure flap on one of the foldable panels, said apparatus comprising a pair of tucking blades mounted for swinging movement about spaced parallel axes and adapted to engage the collapsible panels on the carton to tuck the latter inwardly, folding means including a pair of folding bars, arms attached to said bars and swingably supported for movement about an axis perpendicular to the axes of movement of said blades and parallel to the plane defined thereby, a carriage mounted for vertical reciprocation from a raised position above said blades to a lowered position, means on said carriage operative in response to movement of said carriage from said raised position toward said lowered position for swinging said blades inwardly during the initial downward movement of the carriage and for thereafter swinging the blades outwardly as the carriage moves to its lowered position, means on said carriage engageable with said arms for swinging the folding bars together as the carriage moves

downwardly to thereby fold the foldable sides together, a pair of sealing jaws mounted on said carriage for movement therewith, said jaws being normally spaced apart and arranged to engage the closure flap on one end panel as the carriage is lowered to fold the flap over onto the opposite end panel, a first fluid pressure operated means for raising and lowering said carriage, a second fluid pressure operated means for moving said jaws together in a sealing operation, means for selectively applying fluid pressure to said first fluid pressure operated means, and valve means responsive to a preselected fluid pressure at said first means for applying fluid pressure to said second fluid pressure operated means.

8. An apparatus for folding and sealing cartons having a foldable upper end portion including opposed collapsible panels, opposed foldable panels and a closure flap on one of the foldable panels, said apparatus comprising a pair of upright posts, a pair of tucking blades mounted on said posts for swinging movement about spaced parallel axes disposed perpendicular to the plane of said posts, a pair of folding bars disposed on opposite sides of said posts and extending parallel to the plane thereof, arms attached to said bars and mounted on said posts for vertical swinging movement, a carriage mounted for vertical sliding movement on said posts, means for raising and lowering said carriage, means on said carriage operable to swing said tucking blades inwardly as the carriage moves downwardly to thereby tuck the collapsible panels inwardly, means on said carriage engageable with said arms to swing said folding bars inwardly to fold said foldable panels together, a pair of opposed sealing jaws mounted on said carriage for movement therewith into and out of sealing position, and means for operating said jaws to seal the top of the carton therebetween.

9. An apparatus for folding and sealing cartons hav-

ing a foldable upper end portion including opposed foldable panels and a closure flap on one of said panels, said apparatus comprising a carriage mounted for vertical movement, a pair of sealing jaws mounted on said carriage for movement therewith into and out of sealing position adjacent the upper end of a carton, a pair of folding members, arms attached to said folding members and mounted for swinging movement to move the members toward each other whereby to fold said foldable panels inwardly, means for raising and lowering said carriage, said arms having a cam track formed thereon, means on said carriage engageable with said track for moving said members inwardly as the carriage is lowered, said cam tracks on said arms being arranged to initially move the member engageable with the foldable panel having the closure flap thereon inwardly more rapidly than the other member whereby to position the closure flap in the path of movement of the sealing jaws, said jaws engaging said flap as the carriage is lowered to fold the flap over onto the other foldable panel, and means for operating said jaws to press and seal the carton top therebetween.

10. The combination of claim 9 wherein said cam tracks are arranged to move said other foldable panel inwardly into engagement with said one foldable panel after the sealing jaws engage the closure flap on said one panel.

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