June 23, 1936. P. G. SCHLEMMER 2,045,254

BAG CLOSING MACHINE

Filed Nov. 17, 1933 4 Sheets-Sheet 1

Fig. 1.

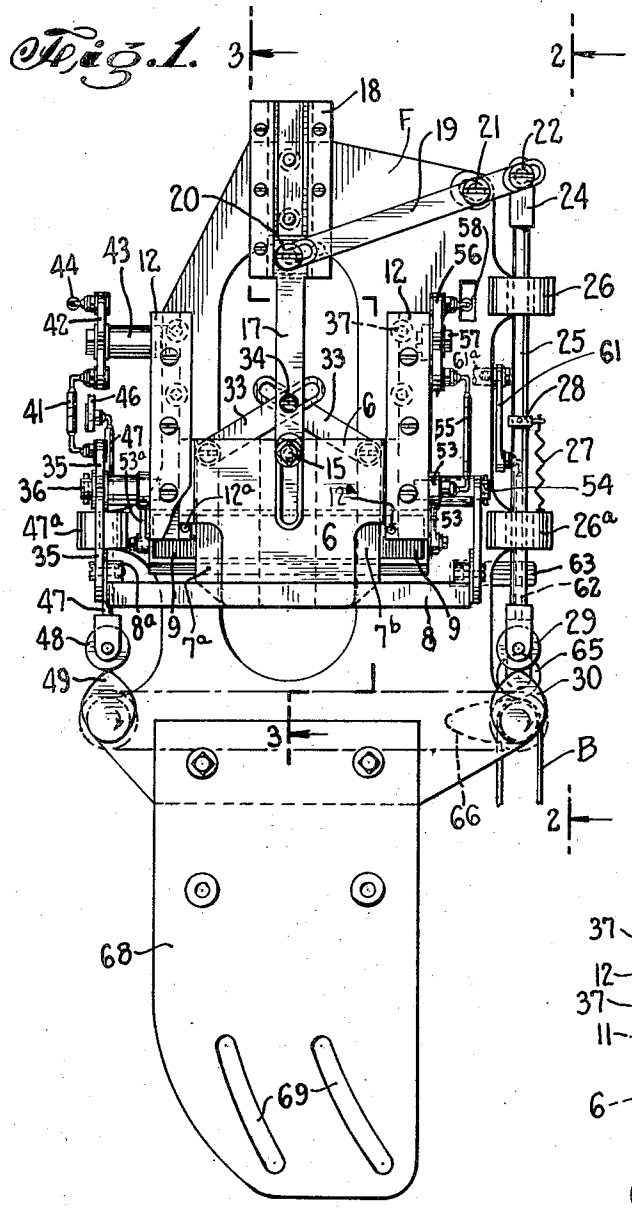
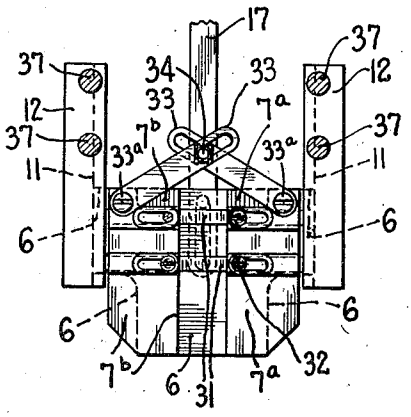


Fig. 4.



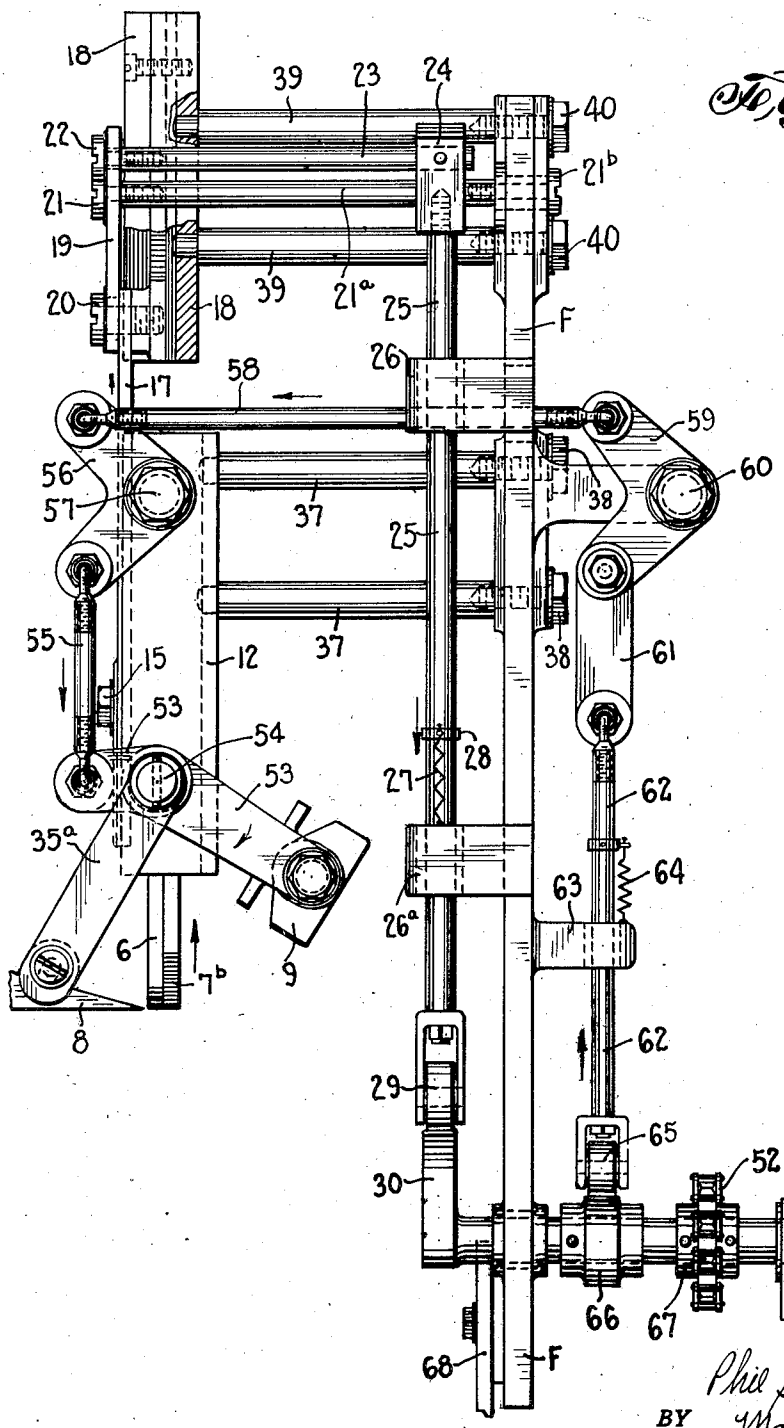
INVENTOR
Phil G. Schlemmer
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ATTORNEYS

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BAG CLOSING MACHINE

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Fig. 2.



Phil G. Schlemmer INVENTOR

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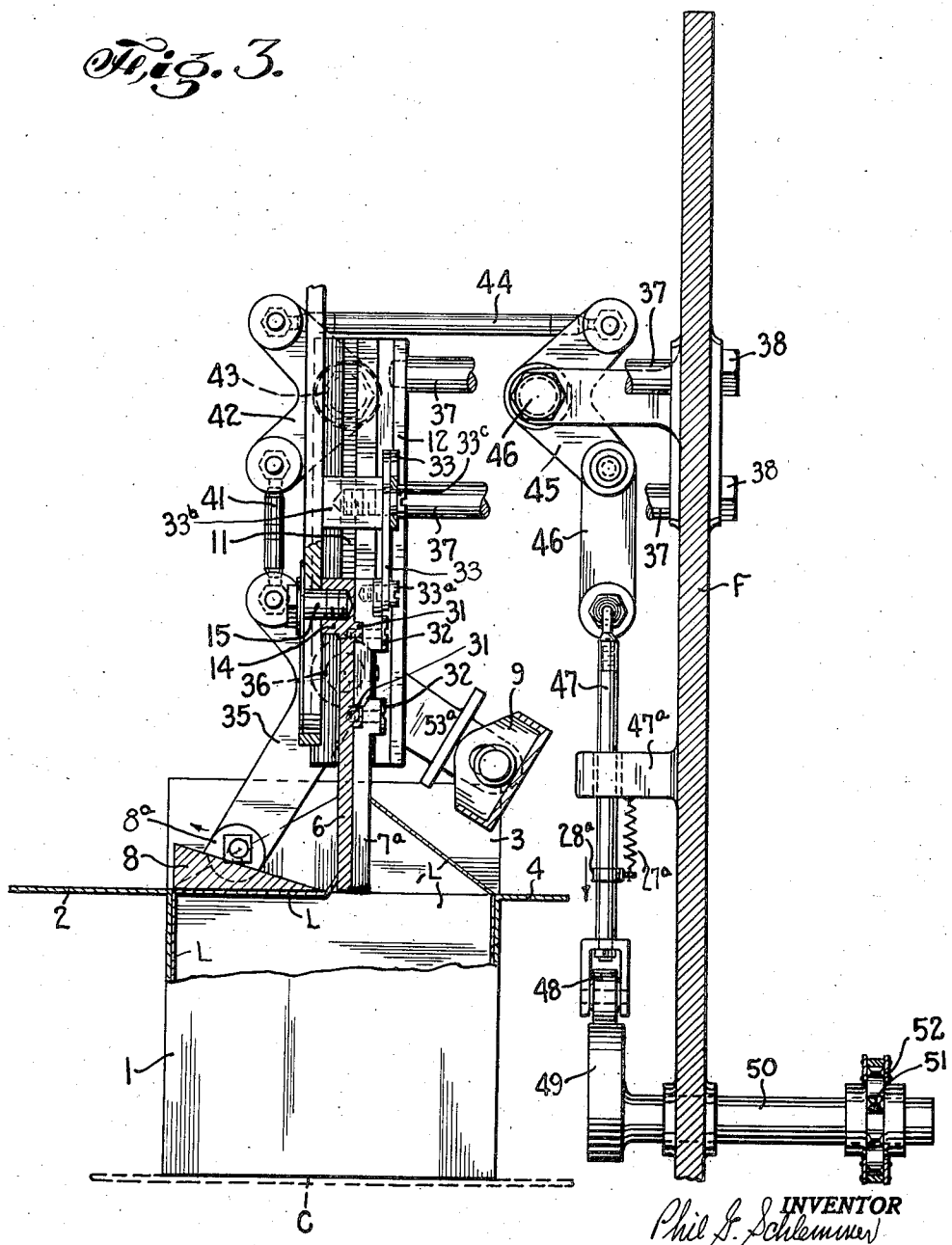
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June 23, 1936. P. G. SCHLEMMER 2,045,254

BAG CLOSING MACHINE

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Fig. 3.



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BAG CLOSING MACHINE

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Fig. 5.

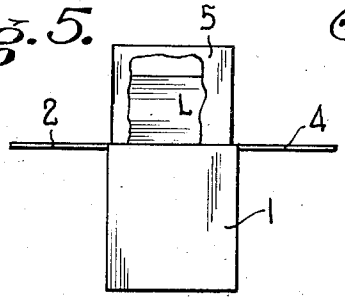


Fig. 9.

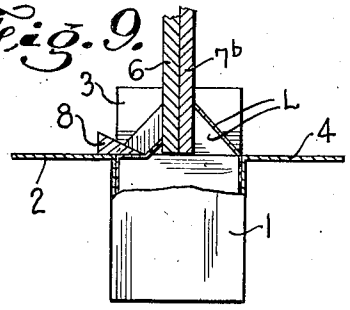


Fig. 6.

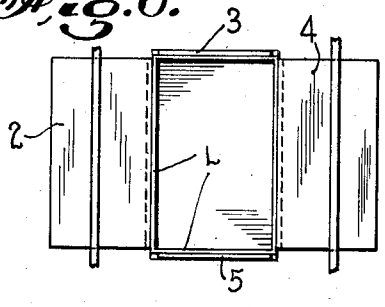


Fig. 10.

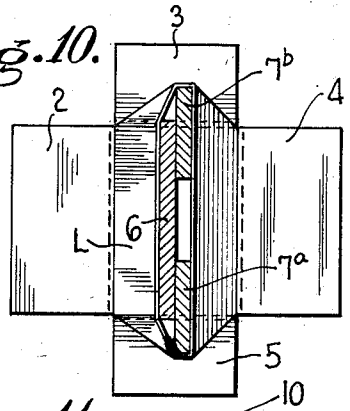


Fig. 7.

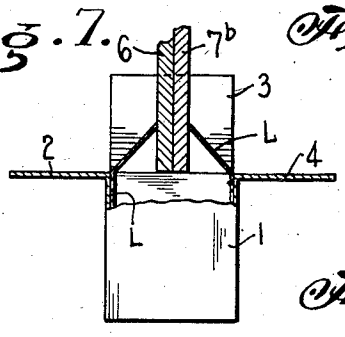


Fig. 11.

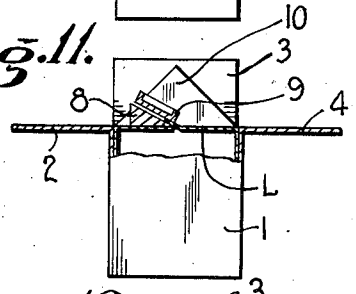


Fig. 12.

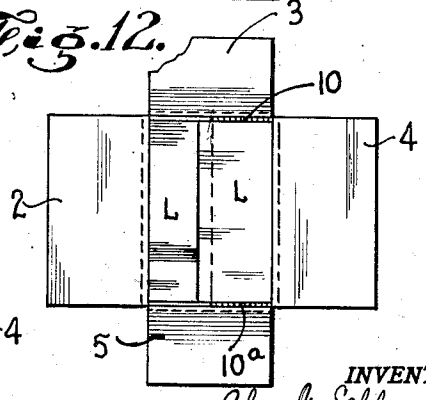
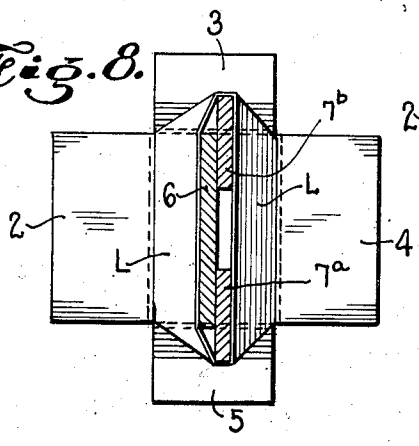


Fig. 8.



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Patented June 23, 1936 2,045,254

UNITED STATES PATENT OFFICE

2,045,254

BAG CLOSING MACHINE

Phil G. Schlemmer, Nanuet, N. Y., assignor, by mesne assignments, to Rose Barbara Henderson

Application November 17, 1933, Serial No. 698,383

4 Claims. (Cl. 93—6)

My invention relates to a new and improved bag closing machine.

One of the objects of my invention is to provide an improved machine for closing a bag which is located within an outer carton which is made of cardboard or the like.

Another object of my invention is to provide a new and improved method or system for closing the mouth of a liner bag of said type, while closing the end flaps of the outer cardboard container.

Other objects of my invention will be set forth in the following description and drawings which illustrate a preferred embodiment thereof.

Fig. 1 is a front elevation of the improved machine.

Fig. 2 is an outside elevation along the line 2—2 of Fig. 1.

Fig. 3 is a sectional view on the line 3—3 of Fig. 1.

Fig. 4 is a detail rear elevation of the spreader mechanism.

Fig. 5 is an elevation of the carton and liner, said liner having been previously filled. The machine operates upon this device.

Fig. 6 is a plan view of Fig. 5.

Fig. 7 is a detail elevation, partially in section, showing how the spreaders have entered the mouth of the liner and are resting upon the top of the body of the carton.

Fig. 8 is a plan view of Fig. 7.

Fig. 9 is a view which is similar to Fig. 7, and said Fig. 9 shows one of the shoes which are used for closing a flap of the liner.

Fig. 10 is a plan view of Fig. 9, the representation of the shoe having been omitted in order to more clearly illustrate the flap which has been bent down by means of said shoe.

Fig. 11 is a detail elevation, partially in section, showing the operative position of both shoes.

Fig. 12 is a view similar to Fig. 11, the representations of the shoes having been omitted, in order to more clearly show the flaps.

Referring to Figs. 5 and 6, a carton 1 is provided, and this carton is made of cardboard or any other suitable material. This carton may be of rectangular cross section and it is provided with four end flaps, 2, 3, 4 and 5. For convenience it can be assumed that the carton 1 is held with its axis vertical.

Fig. 6 shows the flaps 2 and 4 in horizontal position and the flaps 3 and 5 are shown in the vertical or upstanding position.

When the carton is pushed into the machine, the flaps 2 and 4 have been previously bent into the horizontal position.

The carton 1 is provided with a liner bag L which can be made of paper or any other suitable material. When the carton is pushed into the machine, said liner L has an upstanding top portion which projects above the body of the carton so as to form an open mouth of rectangular cross section.

Referring to Figs. 7 and 8, these figures show three spreader devices 6, 7a and 7b. The spreader devices 7a and 7b can be moved towards each other and away from each other, so as to slide upon the adjacent surface of the member 6.

When the members 7a and 7b abut each other their combined width is equal to the width of the member 6. Said devices are inserted into the open mouth of the liner L while the members 7a and 7b abut each other.

As shown in Fig. 1, the bottom end of the member 6 may be of less width than the body thereof, so that said bottom end can readily enter the open mouth of the liner bag.

When the spreader elements have been inserted into the open mouth of the liner bag, the members 7a and 7b are moved away from each other, as shown in Fig. 8 in order to outwardly bend the end flaps of the liner bag, and to downwardly turn the end flaps 3 and 5 of the carton so that said flaps of the liner bag and carton are inclined to the vertical axis of the carton. Said members 7a and 7b are moved in a linear direction, that is, they are moved bodily, instead of being turned around pivots.

While the spreaders are held in the position shown in Fig. 8, a shoe 8 is moved to the position shown in Fig. 9 in order to inwardly and downwardly bend one side of the mouth of the bag L and thus form an inner closure flap. Since the members 7a and 7b are in their distending position, this inward bending of a side flap of the mouth of the liner bag causes one half of each end flap to be bent inwardly, so as to form triangular folds in said end flaps, which extend substantially to the central lines of said end flaps. This inward bending of the side flap produces a first closure flap which is perpendicular to the common axis of the carton and of the liner bag. Another shoe 9 is then moved against the opposite wall of the mouth of the liner bag in order to inwardly bend the second side flap of the liner bag and form a second closure flap which overlaps the first mentioned closure flap. The shoe 9 also forms triangular folds in the end flaps, so that

said end flaps now have the triangular shapes of Fig. 11.

At a proper time in the movement of the second shoe 9, the spreader elements are withdrawn from the mouth of the bag, and the shoes 8 and 9 finally reach the relative position shown in Fig. 11, so that the second closure flap is firmly pressed between said shoes.

The shoes 8 and 9 are then withdrawn, thus leaving the liner bag with two overlapping closure flaps along the wide edges thereof. The liner bag now has upstanding end triangular flaps 10 and 10*a*.

The end flaps 3 and 5 of the carton can now be moved to their closing position and this will simultaneously inwardly bend the flaps 10 and 10*a* into closing position. The flaps 2 and 4 are then overlapped in the usual manner over said flaps 3 and 5, and the sealing is completed by connecting the flaps 2 and 4 by any suitable adhesive or the like.

It will be noted that this method of closing the combined container saves several operations and simplifies the mechanism because it is not necessary to inwardly bend the flaps 10 and 10*a*. The final closing of the flaps 2, 3, 4, and 5 can be done by any suitable machine.

Referring to Fig. 3, the cartons 1 are supported upon the upper run of a suitable conveyer belt C which is intermittently actuated by any suitable mechanism. Said belt C may be provided with suitable means for holding the cartons thereon, so that each intermittent movement of said belt brings a carton into accurate registration with the spreader mechanism and other parts. Such means for holding the cartons and for moving the belt are not illustrated herein as they form no part of the invention per se.

Referring to Fig. 4, the spreader 6 has the shape illustrated therein, and the wide upper end of said spreader 6 is mounted so as to slide in vertical grooves 11 of guides 12. The downward movement of spreader 6 is limited by stop pins 12*a*. As shown in Fig. 3, the upper end of the spreader 6 is provided with a boss 14. A screw 15 engages this boss 14. The shank of the screw 15 passes through a vertical slot in a slide arm 17. This slot makes it possible to move the arm 17 relative to said screw 15. The upper end of the arm 17 is provided with a slide head which slides in vertical grooves provided in a guide 18.

The arm 17 is moved up and down by means of a lever 19, one of whose slotted ends is turnably connected to the head of the arm 17 by means of a pivot screw 20. The lever 19 is pivotally connected to the frame F of the machine by means of a pivot screw 21. This screw engages a rod 21*a* which is connected to F by a bolt 21*b*.

The outer slotted end of the lever 19 is turnably connected by means of a screw 22 to a horizontal rod 23 which passes through and which is connected to the head 24 of a vertically movable rod 25. The rod 25 is slidably mounted in bearings 26 and 26*a*, which are suitably connected to the frame of the machine.

The tension spring 27 has its lower end connected to the bearing 26*a* and its upper end is connected to the pin of a collar 28, which is secured to the rod 25.

The lower end of the rod 25 is provided with a roller 29, and the tension spring 27 causes the roller 29 to be forced against a cam 30.

Referring to Fig. 4, the spreader element 6 is provided at its rear surface with transverse bars 31. The screws 32 have their shanks passing through lateral slots which are provided in the spreader elements 7*a* and 7*b* and the shanks of said screws are connected to the lateral bars 31. The heads of said screws 32 are wider than the slots of the spreader elements 7*a* and 7*b* so that said spreader elements 7*a* and 7*b* are guided for lateral sliding movement upon the adjacent surface of the element 6.

Arms 33 are pivotally connected to the upper ends of the spreader elements 7*a* and 7*b* by means of pivot members 33*a*. The screw 34 holds the block 33*b* fast to slide arm 17. A pivot screw 33*c* passes through the upper slotted ends of said arms 33, which cross each other, and the shank of said screw 33*c* is connected to the vertically movable member 17, and to the block 33*b*, which moves in unison with member 17.

Hence, when the member 17 is moved upwardly from the position shown in Fig. 4, said member 17 first has a limited sliding movement relative to the member 15, and during said limited sliding movement the toggle arms 33 are turned, so as to laterally slide the members 7*a* and 7*b* towards each other.

When said members 7*a* and 7*b* abut each other, the arm 17 simultaneously raises the members 6 and 7*a* and 7*b*.

During the downward movement of the arm 17, there is little or no friction in the movement of the member 6, so that the members 6 and 7*a* and 7*b* move downwardly together, without any lateral movement of the members 7*a* and 7*b*.

The stop pins 12*a* limit the downward movement of the member 6. Hence, when the downward movement of member 6 is stopped, the further downward movement of the member 17 causes the lateral spreading movement of the members 7*a* and 7*b*, while the slotted lower end of the member 17 moves relative to the screw 15.

Referring to Fig. 3, the shoe 8 is provided with lugs 8*a* to one of which a bell-crank lever 35 is pivotally connected. Said bell-crank lever 35 and a cooperating link 35*a*, are pivotally mounted upon pins 36 and 54, which are fixed to the guides 12.

As shown in Fig. 2, the guides 12 are connected to the frame plate F by means of rods 37 which are held in position by means of screws 38.

Likewise, and as shown in Fig. 2, the top guide 18 is connected to the frame plate F by means of rods 39 and screws 40.

The upper end of the bell crank lever 35 is connected by means of a link 41 to a bell crank lever 42 which is pivoted upon a pin 43, which is also connected to the adjacent guide 12.

The link 41 can be connected to the adjacent ends of the levers 35 and 42 by means of ball-socket joints, so as to permit said members 35 and 42 to move in unison without binding.

The upper end of the bell crank lever 42 is connected by means of a link 44, with the upper end of the bell crank lever 45 which is mounted upon a pivot member 46 which is suitably secured to a bracket of the frame plate F.

The lower end of the bell crank lever 45 is pivotally connected to a link 46*a* and this is connected by means of a ball and socket connection to a rod 47 having a roller 48 which abuts a cam 49. The cam 49 is mounted upon and turns in unison with a jack-shaft 50 which is provided with a sprocket wheel 51, which is operated by

means of a chain **52**. A compression spring **27***a* bears against collar **28***a* of rod **47**, so that roller **48** is pressed against cam **49**. Rod **47** slides in bearing **47***a*.

The jack-shaft **50** is thus driven from the main shaft upon which the cam **30** is located. As the shaft **50** is continuously turned in the same direction, the shoe **8** is reciprocated back and forth along a curved path.

Referring to Figs. 1 and 2, the shoe **9** is pivotally mounted at the end of a bell-crank lever **53** and an arm **53***a* which are turnably mounted on pins **54** and **36**.

The bell-crank lever **53** is connected by means of a link **55** to a bell crank lever **56** which is pivotally mounted upon a member **57**, which is suitably connected to the adjacent guide **12**.

The connection between the link **55** and the levers **53** and **56** may be a ball and socket connection.

The bell-crank lever **56** is connected by means of a link **58** to a bell-crank lever **59**, which is pivotally mounted at **60** to a bracket which extends from the frame plate F.

The link **58** passes through a suitable opening in the frame plate F.

The lever **59** is connected to a link **61** and this is pivotally connected to a rod **62**, which can slide up and down in a bearing **63** which is connected to the frame plate F.

The tension spring **64** downwardly urges the rod **62** so that the roller **65** abuts the cam **66**, which is mounted upon the main shaft S.

The main shaft S has a sprocket **67** over which the chain **52** passes. The main shaft S is driven by a belt B or by any other suitable means.

As shown in Fig. 1, the frame plate F is supported upon a bracket **68**, which can be vertically adjusted by means of slots **69** through which suitable clamping members can be passed in order to clamp said bracket **68** to a suitable base.

The entire machine can therefore be adjusted vertically with respect to the conveyer belt C in order to allow for boxes of different heights.

When a carton is located in proper position, the cam **30** first upwardly moves rod **25**, so that member **17** is depressed, the spreader elements are moved downwardly until their tapered ends enter the open mouth of the liner bag, and the spreader elements **7***a* and **7***b* are then moved laterally, when the element **6** has its shoulder abutting the stop pins **12***a*. Figs. 1 and 4 show the spreader elements **7***a* and **7***b* slid apart to the maximum distance. While this is being done, the flaps **2** and **4** are held horizontal by the rods shown in Fig. 6.

While the spreader elements are thus actuated, the cam **49** causes the actuation of shoe **8**, so that said shoe has been moved to the position shown in Fig. 9, when the spreader elements **7***a* and **7***b* have reached the position shown in Fig. 10.

However, due to the limited free relative movement between the members **17** and **15**, the spreader elements enter the open mouth of the liner, before the shoe **8** substantially forms the flaps in the adjacent side wall of the liner, and in the adjacent end walls of the liner.

The spreader elements **6** and **7***a* and **7***b* can be made thin so that the end flaps of the liner L are substantially closed by the formation of triangular sub-flaps therein.

After the shoe **8** has been moved to the operative position which is illustrated in Fig. 9, the cam **66** causes the movement of the shoe of shoe **9**.

As shown in Fig. 1, there is a lag of 90° between the cam **30** and the cam **66**.

While I have referred to a bag having a rectangular cross-section, the invention is not to be limited to any particular shape of bag. Hence, whenever I refer to a bag having a rectangular cross-section in the claims, said claims are not to be limited to the use of a device in connection with this specific type of bag.

Likewise whenever I refer to shoes for inwardly bending certain portions of the mouth of the bag, I desire to include any equivalent means for accomplishing the same general result.

As indicated in Fig. 6, the flaps **2** and **4** may be held in horizontal position by suitable rods, while the spreader means and the shoes are operated.

I have shown a preferred embodiment of my invention, but it is clear that numerous changes and omissions can be made without departing from the spirit of my invention.

I claim:

1. For use in closing the open end of a bag, a first spreader element which is adapted to enter said open end, additional spreader elements connected to the first spreader element, said additional spreader elements being laterally movable with respect to each other and with respect to the first spreader element, and means for moving all said spreader elements in unison and for moving said additional spreader elements relative to each other and relative to the first spreader element.

2. For use in closing the open end of a bag, a first spreader element, guide means for guiding the movement of said first spreader element, additional spreader elements connected to said first spreader element, said additional spreader elements being laterally movable with respect to each other and with respect to the first spreader element, an arm for actuating the first spreader element, said arm having a limited movement relative to said first spreader element, and additional arms pivotally connected to said first mentioned arm and to said additional spreader elements.

3. In a device for closing the open end of a bag which has a rectangular cross-section, movable spreading means adapted to enter said mouth and to oppositely spread two of the end flaps of said mouth and to hold the end flaps sides upstanding, folding means adapted to inwardly bend the side flaps of said mouth in overlapping relation and to inwardly bend the corners of said end flaps, and mechanism for operating said folding means before said spreading means have been moved to inoperative position.

4. A device for closing an open end of a bag, comprising movable spreader means adapted to enter into and downwardly into a bag mouth and spread two end flaps of the mouth of said bag in opposite directions, a movable folding member adapted to inwardly bend a side flap of the end of said bag and mechanism for moving said spreader means into the end of said bag and for operating said spreader means and for operating said folding member while said spreading means are in the bag and in operative position.

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