June 16, 1953 C. F. RICHARD 2,641,882

BAG PACKAGING MACHINE

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Fig. 1

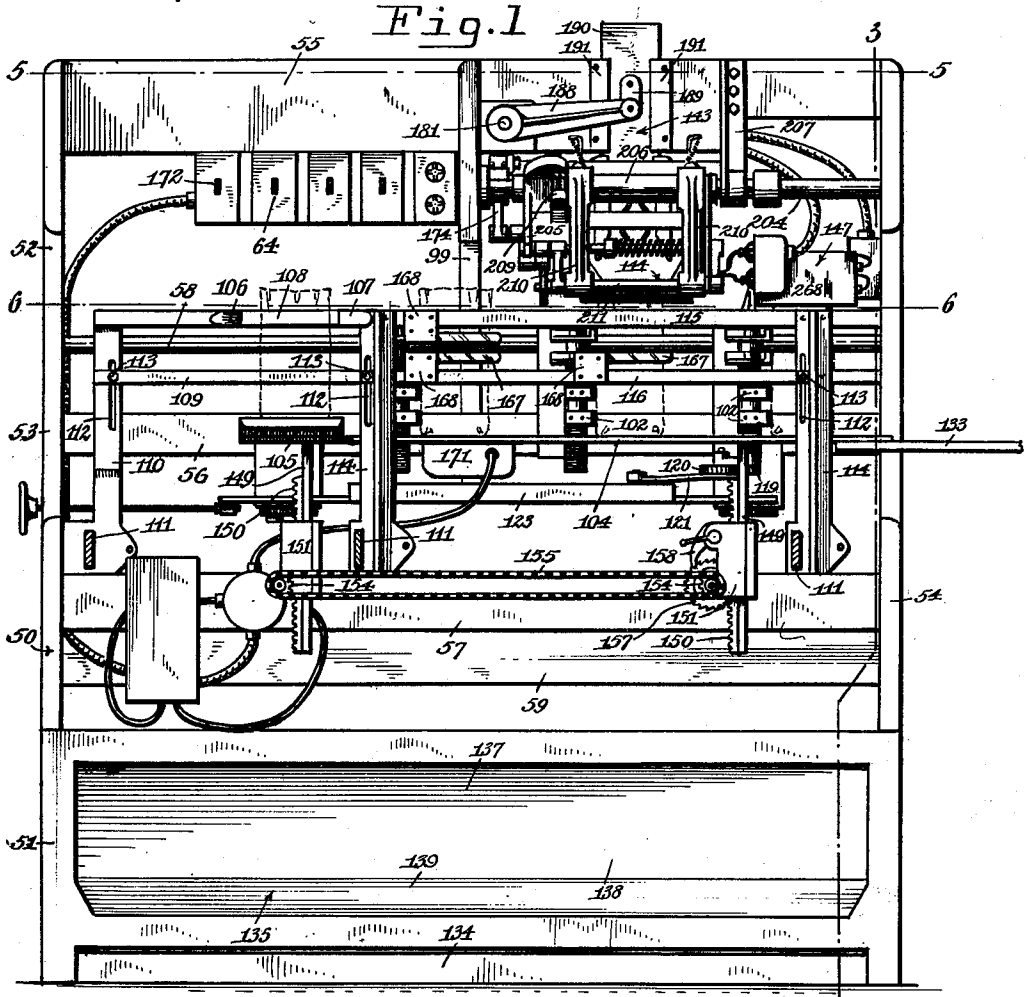
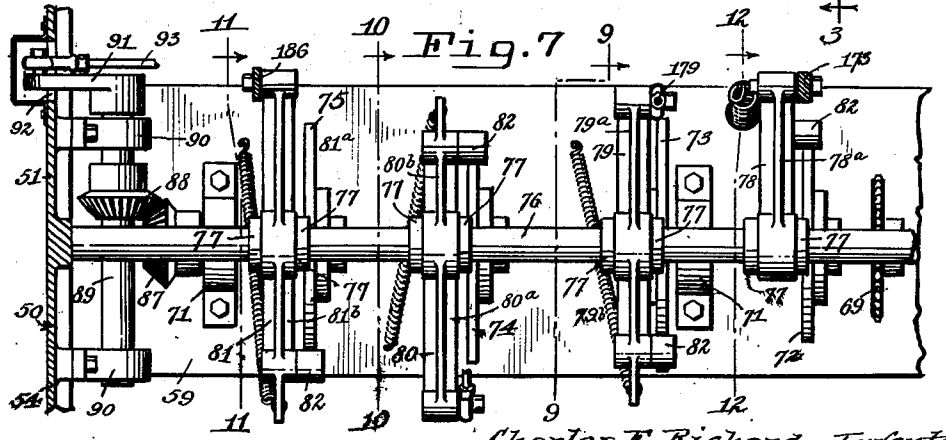


Fig. 7



Charles F. Richard, Inventor

By Emil Neubart

Attorney

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BAG PACKAGING MACHINE

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Fig. 2

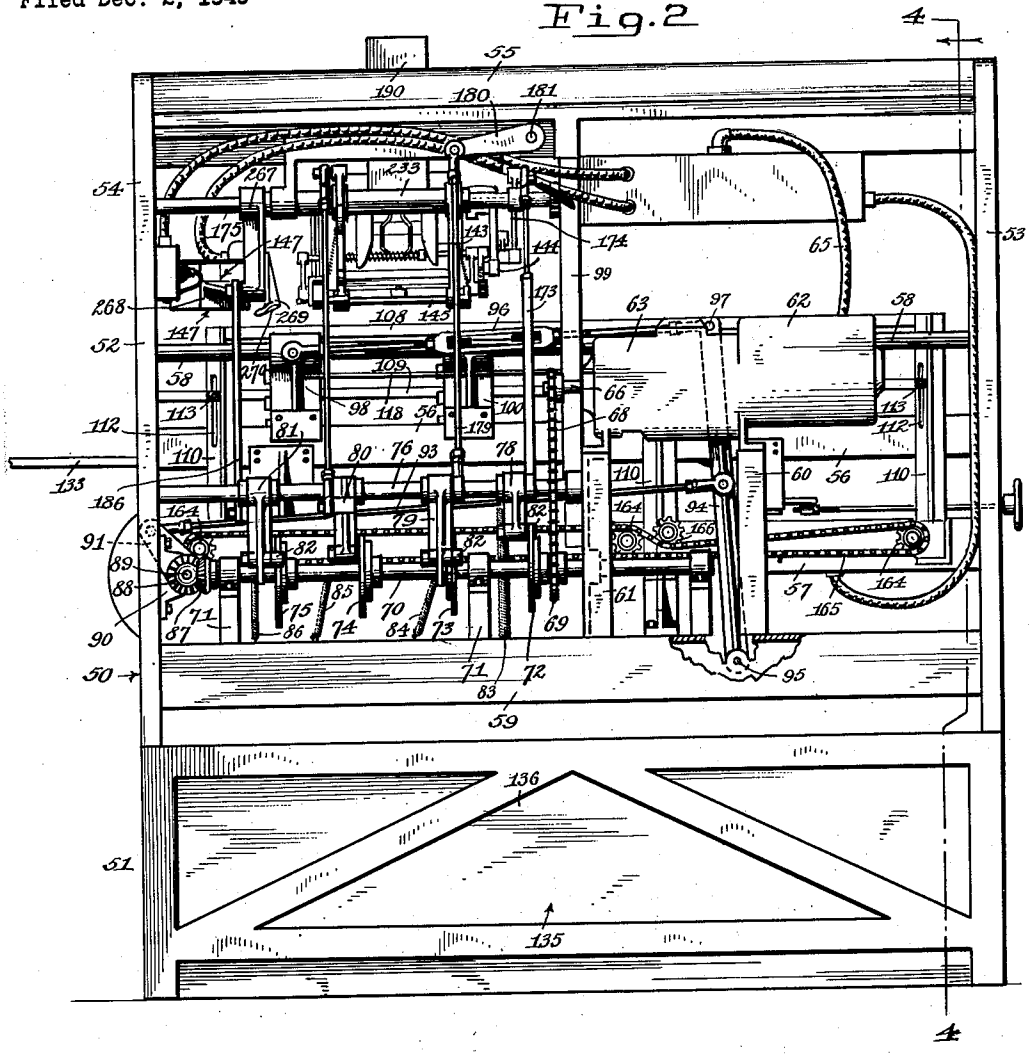
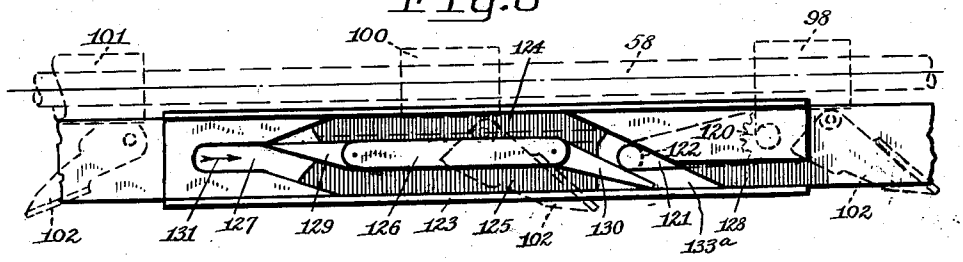


Fig. 8



Charles F. Richard, Inventor

By Emil Neubart

Attorney.

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BAG PACKAGING MACHINE

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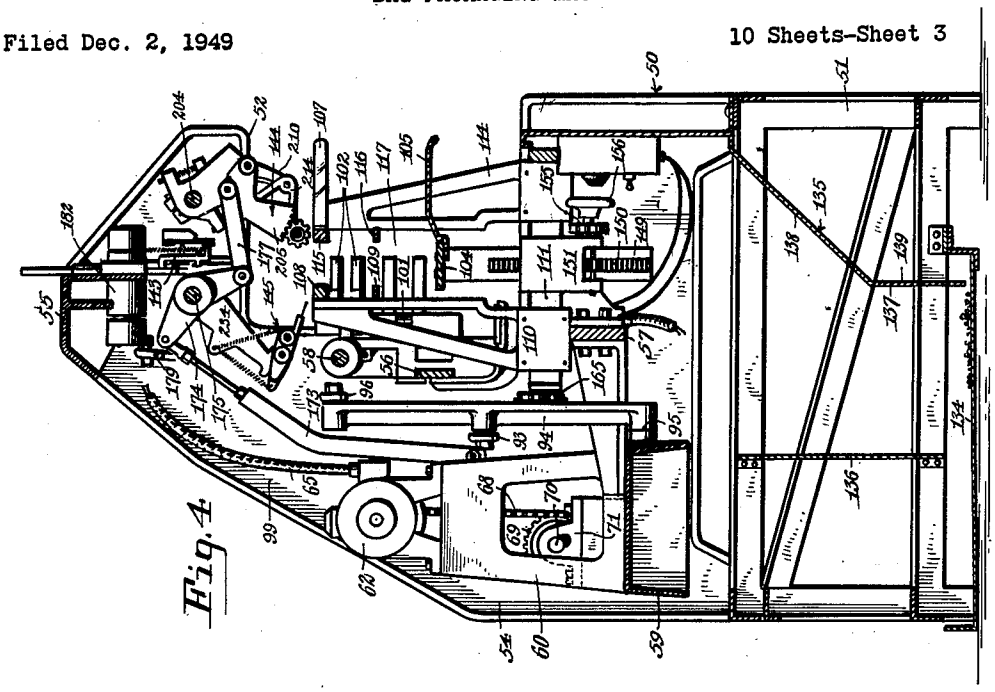


Fig. 4.

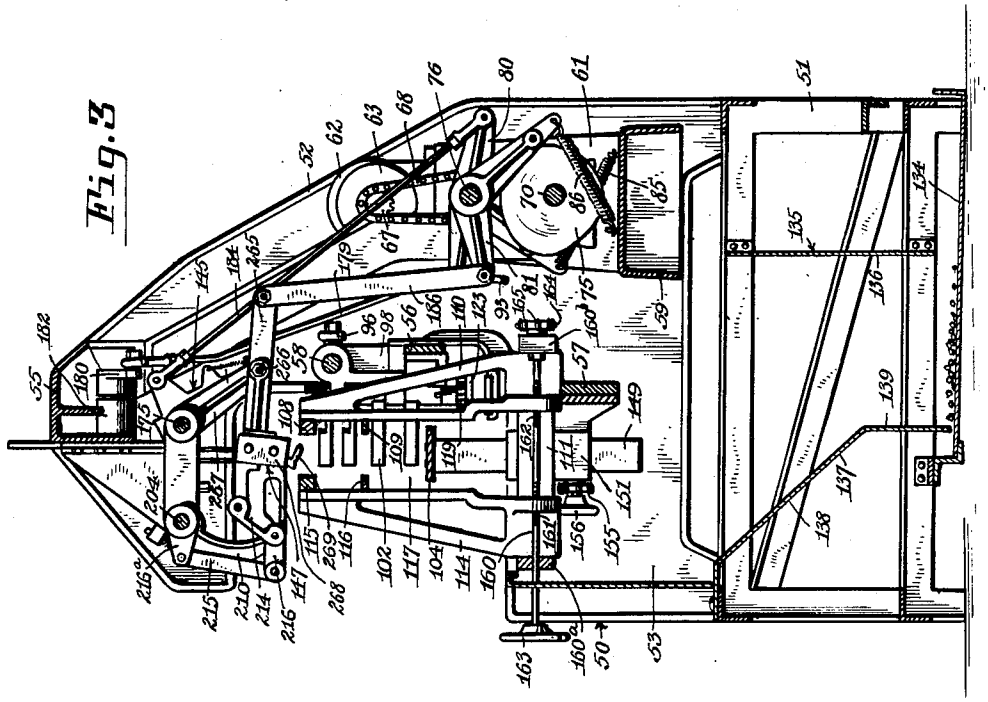


Fig. 3.

Charles F. Richard, Inventor
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Fig. 5

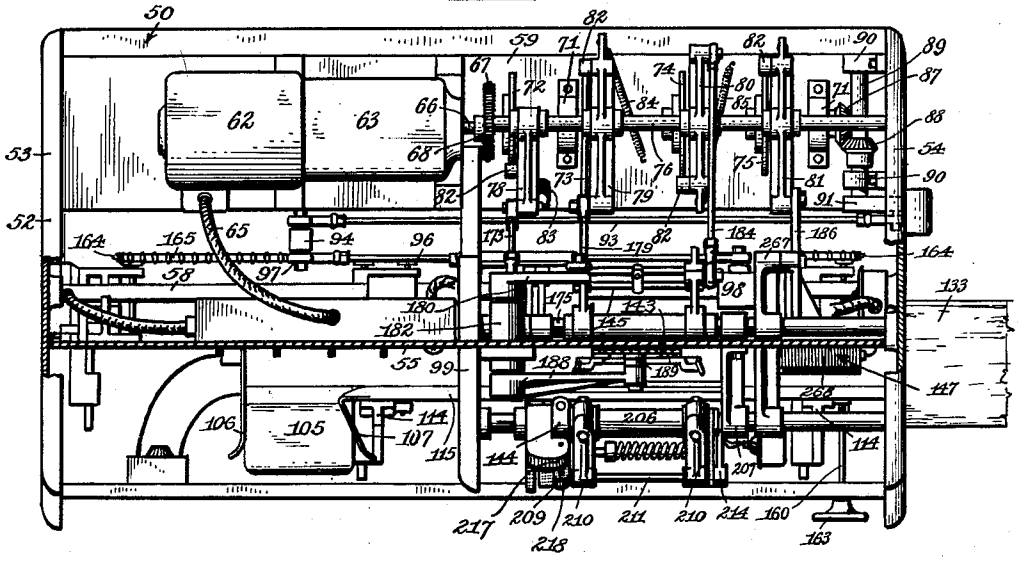
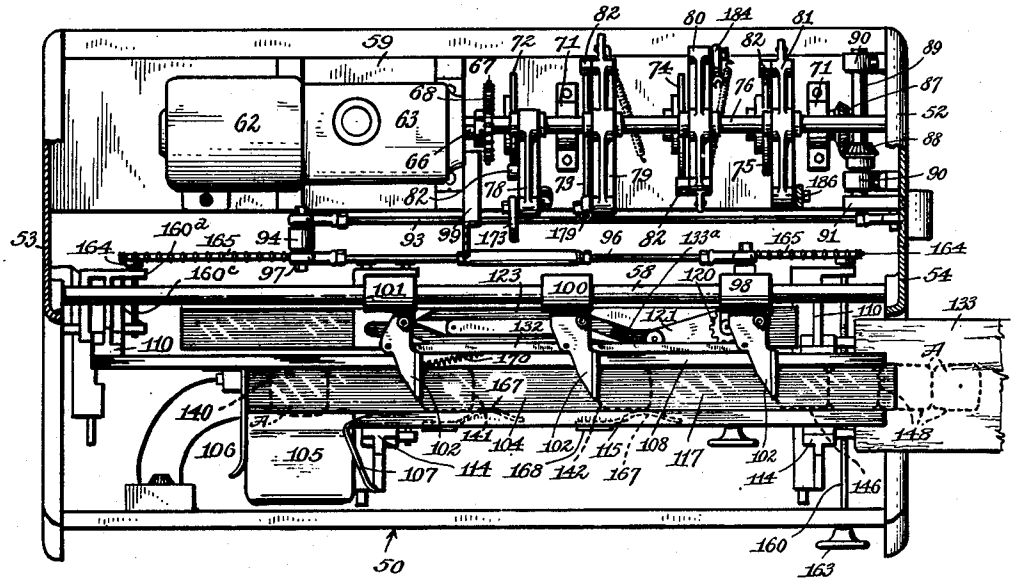


Fig. 6



Charles F. Richard, Inventor

By Emil Neubart

Attorney

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BAG PACKAGING MACHINE

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Fig. 9

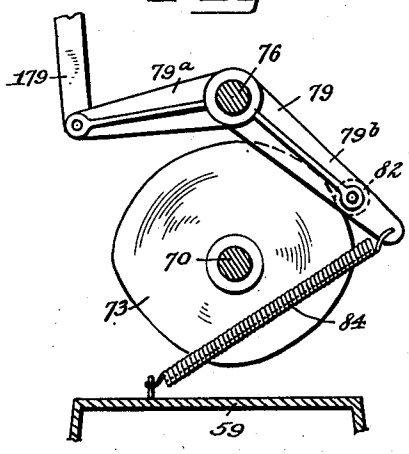


Fig. 10

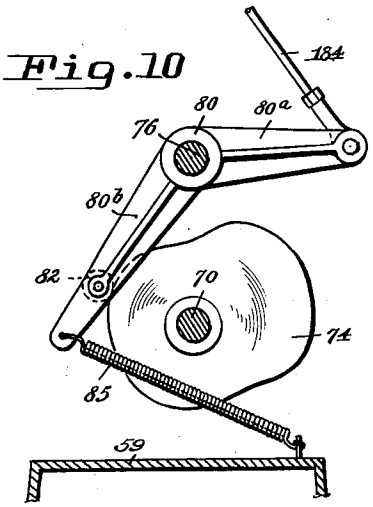


Fig. 11

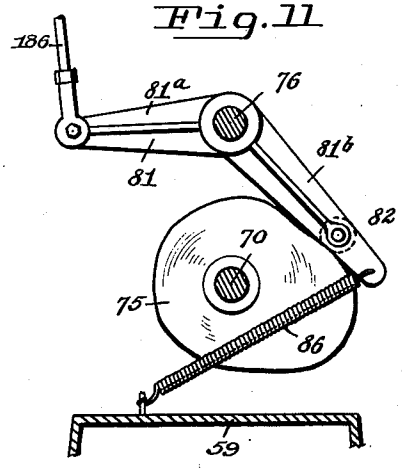
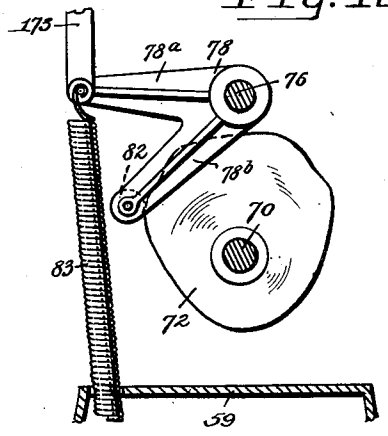


Fig. 12



Charles F. Richard, Inventor
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Attorney.

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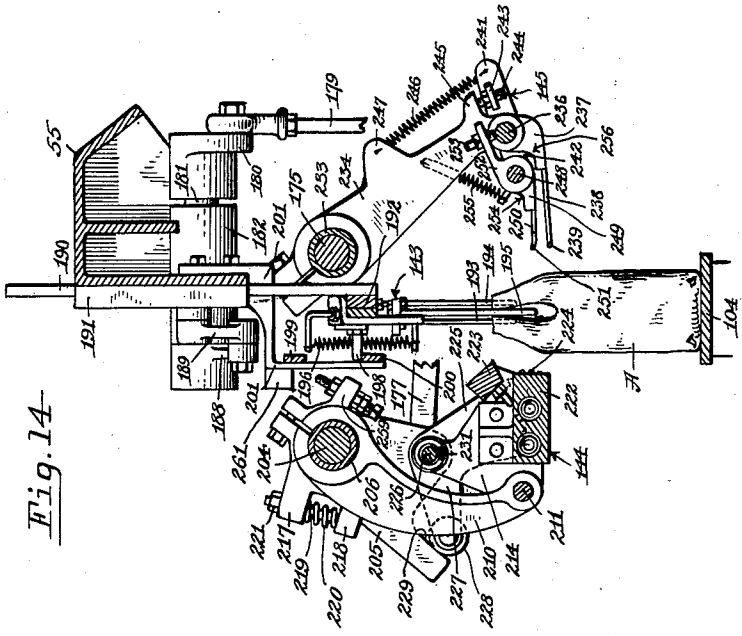


Fig. 14

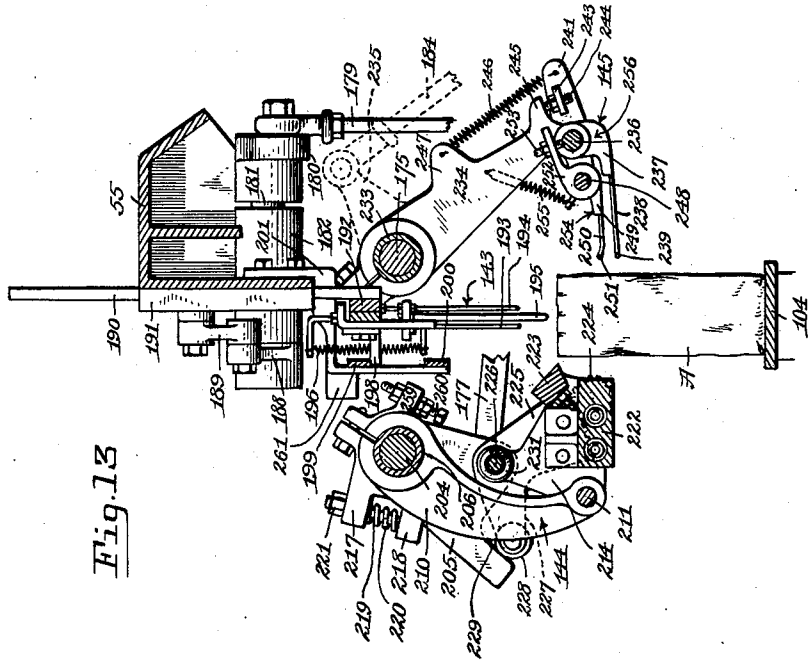


Fig. 13

Charles F. Richard, Inventor
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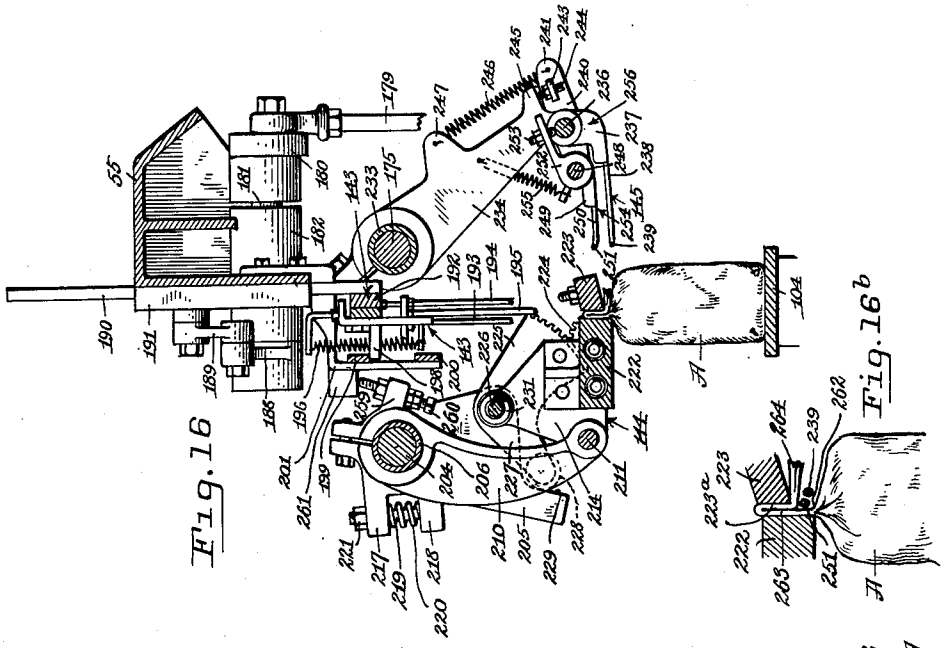


Fig. 16

Fig. 16b

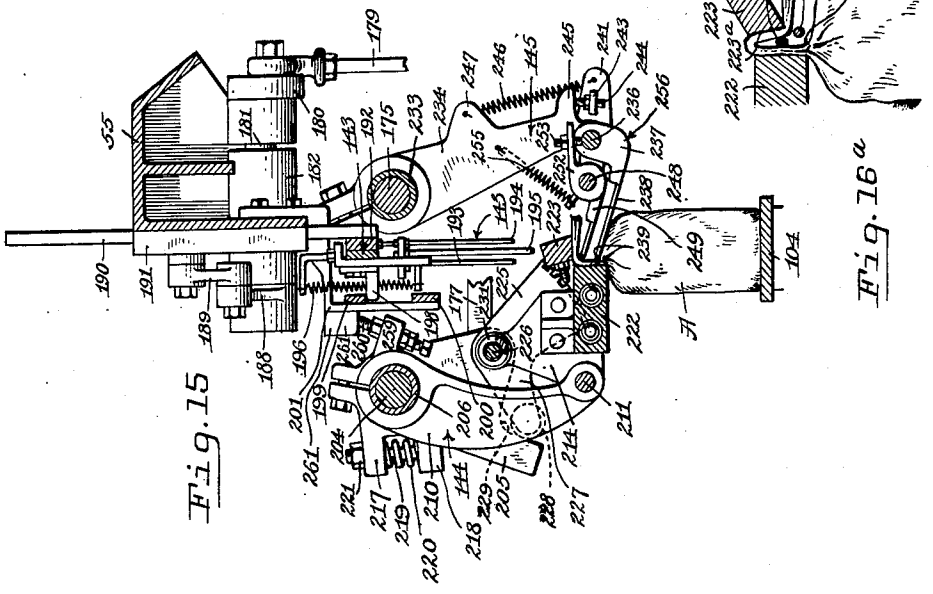


Fig. 15

Fig. 16a

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BAG PACKAGING MACHINE

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Fig. 17

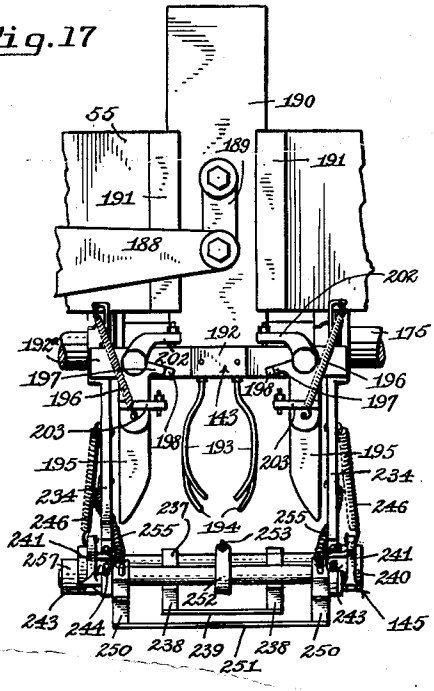


Fig. 18

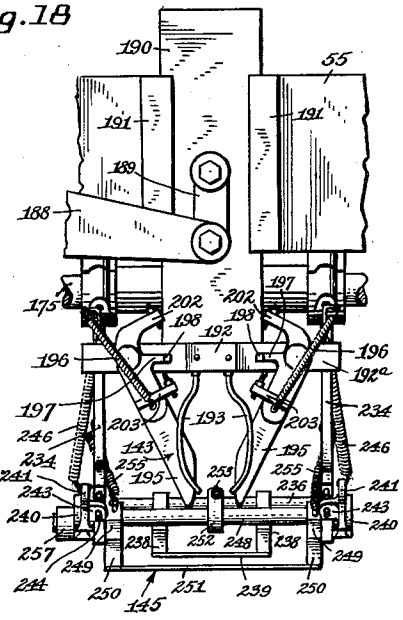


Fig. 19

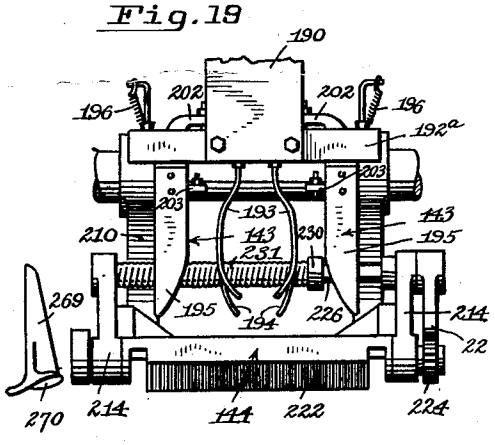


Fig. 20

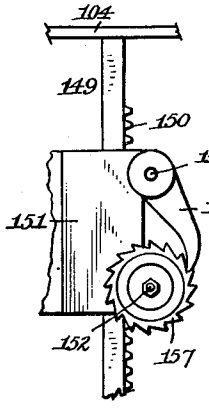


Fig. 21

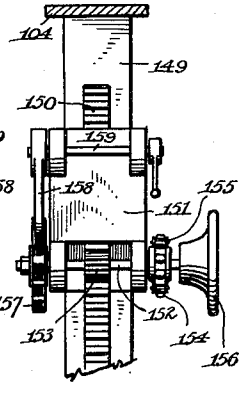
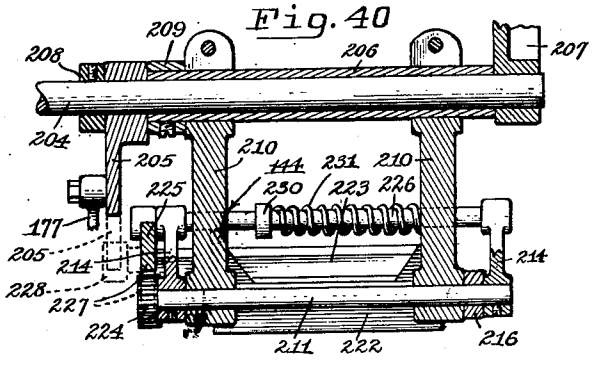


Fig. 40



Charles F. Richard
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Attorney.

June 16, 1953 C. F. RICHARD 2,641,882

BAG PACKAGING MACHINE

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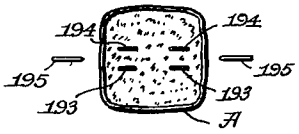


Fig. 22

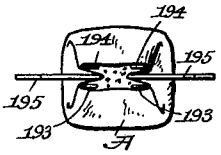


Fig. 23

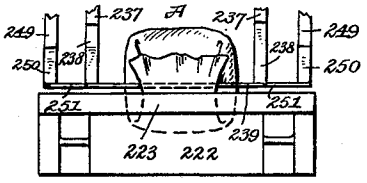


Fig. 24

Fig. 25

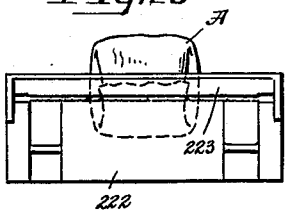


Fig. 26

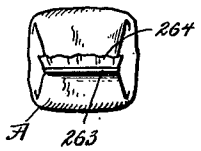


Fig. 27

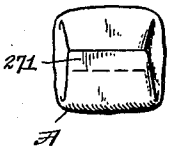


Fig. 28

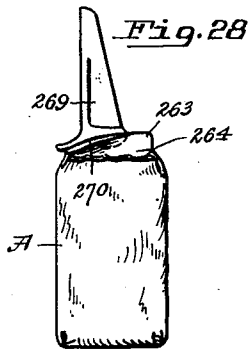


Fig. 29

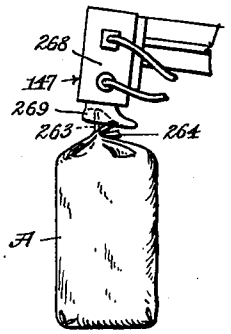


Fig. 30

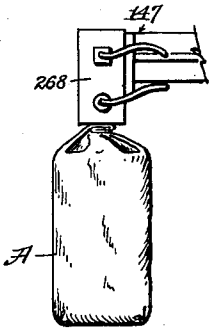


Fig. 31

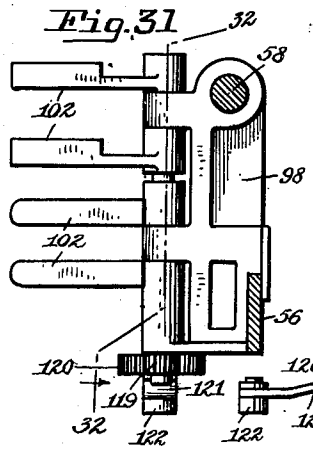


Fig. 32

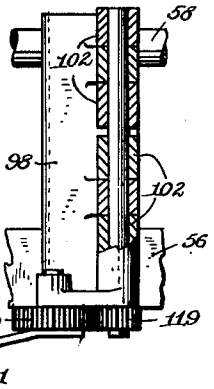
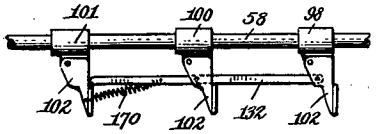


Fig. 33



Charles F. Richard
Inventor,
By Emil Neubert
Attorney.

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BAG PACKAGING MACHINE

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Fig. 34

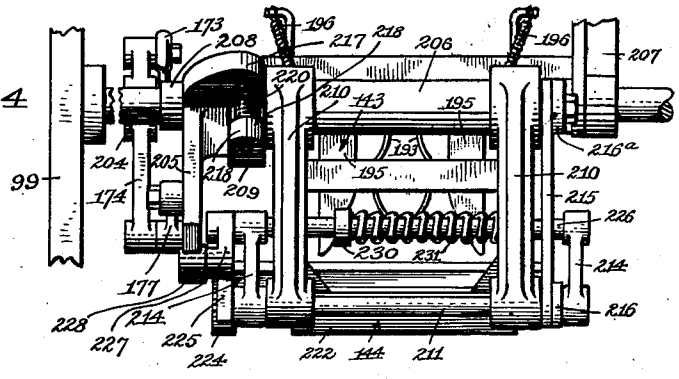


Fig. 35

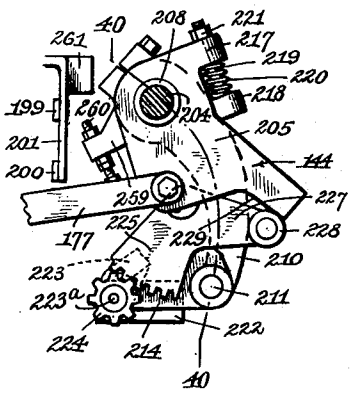


Fig. 36

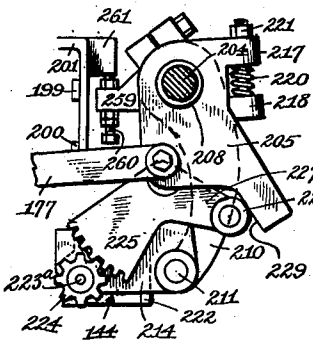


Fig. 37

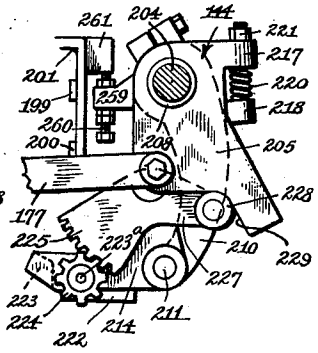


Fig. 38

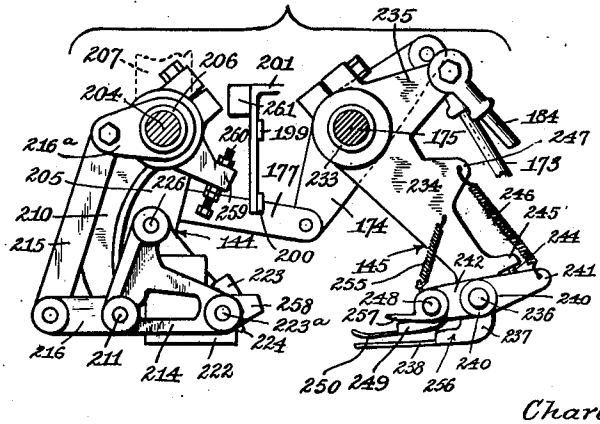
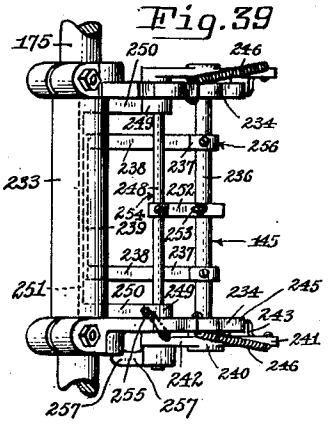


Fig. 39



Charles F. Richard, Inventor

By Emil Kunbark

Attorney.

Patented June 16, 1953 2,641,882

UNITED STATES PATENT OFFICE

2,641,882

BAG PACKAGING MACHINE

Charles F. Richard, Williamsville, N. Y., assignor to Niagara Packaging Machinery Corporation, a corporation of New York

Application December 2, 1949, Serial No. 130,620

15 Claims. (Cl. 53—144)

1

My invention relates to a packaging machine, and more particularly to a machine for packaging foods, confections and other bulk wares, in cellophane or other bags formed of foldable and sealable material.

One of the objects of my invention is to provide a machine of the type mentioned which will automatically pass open partly-filled bags or other flexible containers through the machine, fold the bags over the contents in order to close the same, seal the folded portions of the bags and deliver them from the machine in condition to be marketed, all under a continuous operation of novel parts or assembly of parts of comparatively simple construction and highly effective in operation.

Another object of my invention is to provide a new and novel means for folding the open end of a bag partially filled with a suitable commodity.

A further object is to provide new and novel means for sealing the bag after the open-ends thereof have been folded.

A still further object is to provide new and novel means for advancing bags filled according to bulk or weight during the act of folding the open end of the bag and sealing the same.

Still further objects are to provide means for adjusting parts of the mechanism embodied in the machine to accommodate bags of different sizes.

With the above and other objects to appear hereinafter, my invention consists in the novel features of construction and in the arrangement and combination of parts or assemblies to be hereinafter described and more particularly pointed out in the subjoined claims.

In the drawings:

Fig. 1 is a front elevation of the machine.

Fig. 2 is a rear elevation of the same.

Fig. 3 is a transverse section taken on or about line 3—3, Fig. 1, looking to the left or in the direction of the arrow crossing said line.

Fig. 4 is a transverse section taken on or about line 4—4, Fig. 2, looking in the direction of the arrow crossing said line.

Fig. 5 is a horizontal section taken on or about line 5—5 of Fig. 1.

Fig. 6 is a horizontal section, taken on or about line 6—6, Fig. 1.

Fig. 7 is an enlarged top plan view of the driving mechanism common to the various operating parts of the machine.

Fig. 8 is a detail showing the switch track in plan view whereby the pusher elements are actuated to cause the packages to be moved through the machine.

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Fig. 9 is a transverse section taken on line 9—9, Fig. 7.

Fig. 10 is a transverse section taken on line 10—10, Fig. 7.

Fig. 11 is a transverse section taken on line 11—11, Fig. 7.

Fig. 12 is a transverse section taken on line 12—12, Fig. 7.

Fig. 13 is a transverse section through a portion of the machine, showing the mechanisms of the bag-folding and sealing assembly in normal positions, permitting the open bags to be moved into the assembly preparatory to folding the free wall portions of the bag over the material contained therein.

Fig. 14 is a similar view, showing the crimping or gusset-folding portion of the folding and sealing assembly lowered into the bag and parts thereof actuated to crimp the sides of the upper free wall portions preparatory to further folding, closing and sealing the bag.

Fig. 15 is a view similar to Figs. 13 and 14, showing the flap-folding mechanism of the folding and sealing assembly in the act of flap-folding the bag preparatory to pressing and sealing the so folded portion of the bag; the crimping or gusset-folding mechanism being returned to normal position.

Fig. 16 is a similar view, showing the fold-gage portion of the assembly withdrawn from the bag and the pressing and sealing portion thereof in action to press the folded portions of the bag together and hermetically seal the same; the crimping or gusset-folding mechanism of the folding assembly being in normal position.

Figs. 16^a and 16^b are detail views, showing different positions of the fold-gage wires which they assume between the positions shown for them in Figs. 15 and 16.

Fig. 17 is a front elevation of the crimping or gusset-folding mechanism forming part of the folding and sealing assembly, the parts being in normal position; also a front elevation of the fold-gage portion of said assembly.

Fig. 18 is a view similar to Fig. 17, showing parts of the crimping or gusset-folding mechanism lowered to the positions they assume when certain parts thereof are entered in the open end of a bag and other parts cause portions of the bag to be crimped or gusset-folded inwardly; the positions of the parts corresponding to those of like parts shown in Fig. 14.

Fig. 19 is a rear elevation of the crimping or gusset-folding mechanism of the folding and sealing assembly.

Fig. 20 is a detail view of the mechanism em-

ployed for raising or lowering the package or bag-supporting track or rail along which the bags are moved.

Fig. 21 is an elevational view showing the raising mechanism shown in Fig. 20 as viewed from the right.

Fig. 22 is a diagrammatic view showing the positions of parts of the crimping or gusset-folding mechanism prior to crimping or gusset-folding the sides of the bag inwardly, the parts shown corresponding with like parts shown in Figs. 13 and 17.

Fig. 23 is a top plan view of a bag crimped or gusset-folded and showing diagrammatically, parts of crimping or gusset-folding mechanism advanced in their operating movement from that shown in Figs. 13 and 17, the positions of the parts corresponding with like parts shown in Figs. 14 and 18.

Fig. 24 is a top plan view of the bag and diagrammatically shows parts of the flap folding mechanism and the fold-gage mechanism, the parts being illustrated in positions they assume while flap-folding the crimped or gusset-folded free end walls in the manner shown in Fig. 15.

Fig. 25 is a similar view, showing the bag flap-folded preparatory to sealing the same, the positions of the parts corresponding with like parts shown in Fig. 16.

Fig. 26 is a top plan view of a bag flap-folded and sealed to so market the same, or optionally, preparatory to pressing the flap-folded portion of the bag downwardly in compact form and supplementarily sealing the same; the bag as shown in this figure being in the form shown in Fig. 16.

Fig. 27 is a plan view of a bag folded and sealed with supplementary action thereon.

Fig. 28 is a side elevation of a bag flap-folded in the manner shown in Figs. 16 and 26 and showing a supplementary folding and sealing element or shoe in the act of pressing the flap-folded portion of the bag downwardly, as shown for example in Fig. 29.

Fig. 29 is an elevation of the bag taken at a right angle to Fig. 28 and showing the supplemental folding and sealing mechanism in action to press the flap-folded portion of the bag downwardly preparatory to supplementarily sealing the same.

Fig. 30 is a view similar to Fig. 29 showing the flap-folded portion of the bag pressed downwardly and the supplemental heater in the act of sealing the bag.

Fig. 31 is a sectional elevation of one of the bag pushing units of the bag pushing or feeding assembly.

Fig. 32 is a vertical sectional view of the same, taken on line **32—32**, Fig. 31.

Fig. 33 is a plan view of the bag pushing or feeding assembly, on a reduced scale.

Fig. 34 is a front elevation of the flap-folding mechanism and a portion of the crimping or gusset-folding mechanism behind the same.

Figs. 35, 36 and 37 are end views of the flap-folding mechanism, showing different positions for parts thereof.

Fig. 38 is an end view of the flap-folding mechanism viewed from the end opposite the end views shown in Figs. 35, 36 and 37, said mechanism being shown in association with and in proper relation to the fold-gage mechanism shown in similar end view.

Fig. 39 is a plan view of the fold-gage mechanism.

Fig. 40, Sheet 8 of the drawings, is a section taken on or about line **40—40**, Fig. 35.

Having reference to the drawings in detail, the numeral **50** designates the frame of the machine, which comprises a base member **51** and a superstructure **52** mounted on the base member and secured thereto in any approved manner.

The frame, and more particularly the superstructure of the frame, comprises end members **53, 54** connected at the top by a longitudinal frame member **55** and by longitudinal connector members **56, 57** disposed between the base member and the top longitudinal frame member **55**. A cylindrical tie rod **58** serving as a guide rod also ties said end members **53** and **54** together.

59 is a table frame-member which connects the end members **53, 54** together. This frame member **59** is disposed along the rear of the machine and on it is mounted the primary actuating mechanism of the machine. On this table frame-member, or elongated platform as it may be termed, supporting uprights **60, 61** are secured, on which are mounted a variable speed motor **62** and reduction gear mechanism within a reduction gear casing **63**.

An electric switch of any common construction, indicated at **64**, is supported by the longitudinal frame member **55** and current-conducting wires passing from said switch to the motor **62** through a conduit **65** serve as a means to operate said motor.

A shaft **66** extends outwardly from the reduction gear casing **63**, which is driven at desired speed by the motor, and this shaft has a sprocket wheel **67** secured thereto around which a sprocket chain **68** is passed; said sprocket chain trending around a sprocket wheel **69** secured to a counter-shaft **70** journaled in suitable bearings **71** rising from the table frame-member or platform **59**.

Secured to the counter-shaft **70**, which may be termed the "driving shaft," at spaced-apart points along the length thereof are cams **72, 73, 74** and **75** which are adapted, through the medium of intervening mechanical parts forming actuating mechanism of various kinds, to operate the bag-feeding mechanism, and in part to control and in part to actuate folding and sealing mechanisms, as will be explained hereinafter.

Disposed in a plane above and parallel with the counter-shaft **70** is a rod **76** non-rotatably secured in the supporting upright **61** and in the end member **54**. Mounted for rocking movement on the rod **76** between collars **77** secured thereto in any approved manner are angular rock levers **78, 79, 80,** and **81**; each of said rock levers having a cam-contacting roller **82** adapted to ride in contact with the peripheral edge of its co-acting cam on the driving or countershaft **70**.

Rock lever **78** comprises two arms **78a, 78b** which are disposed at an acute angle to each other; arm **78b** extending forwardly and downwardly and having its cam-contacting-roller **82** mounted to travel in contact with the peripheral edge of the cam **72**; a retractile spring **83** being secured to the outer end of the arm **78a** which extends forwardly from the rod on which said rock lever is mounted, said spring **83** being comparatively long and extending downwardly through an opening in the table frame-member or platform **59** and having its lower end secured to some fixed point of the machine.

Rock lever **79** comprises two arms **79a, 79b** disposed at an obtuse angle to each other; arm **79b** extending downwardly and rearwardly from the rod **76** and having its cam-contacting roller **82** in contact with the peripheral edge of the cam **73** in rear of a plane passing vertically through the driving or countershaft **70**, while its other arm

79a extends in a forward direction from rod 76, all as best shown in Fig. 9. The cam-contacting roller 82 is maintained in contact with the peripheral edge of the cam 73 by means of a retractile spring 84 secured at one end thereof to the outer end of the arm 79b and its other end to the table-member or platform 59. The outer end of arm 79a is adapted for connection with a mechanical part to be described hereinafter for actuating certain mechanism mounted within the frame structure and forming one part of what may be termed a primary crimping, folding and sealing assembly.

Rock lever 80 comprises two arms 80a, 80b which are disposed at an obtuse angle to each other. Arm 80b extends forwardly and downwardly and its cam-contacting roller 82 is maintained in contact with the peripheral edge of the cam 74 by a retractile spring 85 having one end thereof secured to the outer end of the arm 80b and its other end secured to the table frame-member or platform 59, as clearly shown in Fig. 10. The outer end of the arm 80a is adapted for connection with a mechanical part, to be described hereinafter, for actuating part of mechanism mounted within the frame structure and also forming part of the crimping, folding and sealing assembly.

Rock lever 81 comprises two arms 81a, 81b which are disposed at an obtuse angle to each other. Arm 81b extends rearwardly and downwardly and its cam-contacting-roller 82 is mounted to travel in contact with the peripheral edge of the cam 75 and is so maintained by a retractile spring 86 having one end secured to the outer end of the arm 81b and its other end secured to the table frame-member or platform 59. The other arm 81a of said rock lever extends forwardly and has a mechanical element, to be hereinafter described, secured to its outer end which controls the movement under gravity of certain mechanism mounted in the frame structure and serving as a supplementary folding, and sealing mechanism.

The relative positions of the arms of the respective rock levers shown in Figs. 9 to 12, vary under operation of the machine, depending on the throw or throws of the respective cams 72, 73, 74 and 75 under rotation and are designed to effect the step-by-step feeding of partially filled bags, designated by the letter A, through the machine and the crimping, folding and sealing of the bags in sequence as they progress through the machine.

Secured to the end of the driving or countershaft 70 distant from the motor 62 is a bevel gear wheel 87 which is in mesh with a bevel gear wheel 88 secured to a shaft 89 disposed at a right angle to the driving or countershaft 70 and arranged in the same horizontal plane as the latter.

The shaft 89 is mounted in bearings 90 secured to the inner side of the end frame member 54 and on the forward end of said shaft a crank arm 91 is secured; the end frame member 54 having an opening 92 therein through which the crank arm travels in its rotary motion, caused under rotation of the shaft 89. Pivotally secured to the free end of said crank arm 91 is one end of a rod or pitman 93 which extends lengthwise along the machine and at its distant end has pivotal connection with a lever 94 approximately mid-length thereof, said lever being pivotally connected at its lower end to the table frame-member 59, as at 95, and has one end of a rod 96, substantially horizontally disposed, pivotally connected to its upper end, as at 97 (see Fig. 2);

said rod 96 being adjustable to increase or diminish the length of the same. The opposite end of said rod 96 is pivotally connected to a slide header 98 horizontally movable on the tie rod 58, said slide header being also slidable on the longitudinal connector member 56 which is formed of a flat and comparatively wide bar of metal disposed vertically and serving as a guide rail for said slide header and parts associated therewith, in addition to serving as a connector member for the end members 53, 54 of the frame structure and an intermediate frame member 99 of said structure. The connector member or guide rail 56 is disposed beneath the tie rod 58 and is coextensive therewith.

The tie rod 58 and connector member or guide rail 57 are disposed in parallelism and serve as guides for the slide header 98 and for cooperating slide headers 100, 101 movable with slide header 98.

These slide headers are spaced apart and maintained in spaced relation by any suitable means so that they travel along the tie rod 58 and connector member or guide rail 56 as a unit; but it will be apparent that guides for said slide headers may be otherwise constructed and fastened in the frame of the machine. Each of the slide headers carries one or more pusher arms 102 which are pivotally connected thereto and maintained in retracted position, shown in Fig. 8, by means to be presently described. Said slide headers and pusher arms serve as part of bag or package-feeding mechanism and are associated with a bag or package-supporting rail or track 104 disposed underneath the free ends of the pusher arms when the latter are in extended positions, as shown in Fig. 6.

Extending forwardly from one end of the bag or package-supporting rail or track 104 is a bag-receiving table or platform 105 having guides 106, 107 at opposite sides thereof between which partially filled bags A to be closed and sealed are passed. The bags used are preferably constructed of cellophane or some coated material which, when two layers thereof are brought together and subjected to heat, are sealed; but on occasions, heating of the bags may be dispensed with and the bags otherwise sealed by the closing mechanism provided.

The bags may be filled by hand, or a filling machine mounted at one end of the frame structure adjacent the bag-receiving table or platform 105, may be employed, such filling machines being in common use and include a hopper into which the commodities or wares to be packed are confined and which are discharged therefrom through a filler spout into the open bags. The commodities or wares being bagged are delivered into the open bags according to measure, or weight, depending on the usual method of marketing the goods. In all cases the bags, which are open at the top, are filled to within a short distance of their upper ends and when so partially filled, the upper portions *a* of the four sides of the bag extend upwardly in substantially flat and free condition so that the bag is fully open, as shown diagrammatically in Fig. 22. The partially filled bags are manually pushed from the bag receiving table or platform 105 onto the supporting rail or track 104, with the inner side of the bag in contact with longitudinally-disposed straight-lined guide rails 108, 109, arranged one above the other and fastened to uprights or brackets 110, two of which are transversely adjustable on transversely-disposed supporting rails

111, the lower guide rail 109 being vertically adjustable on the uprights or brackets 110, for which purpose the uprights are slotted, as at 112. Bolts 113 passed through guide rail 109 and through the slots 112 of said uprights or brackets are tightened by nuts in the usual manner, as best shown in Fig. 1. If desired, both the upper and lower guide rails 108, 109 may be made vertically adjustable on the uprights or brackets 110, or the upper guide rail only be so applied to said uprights or brackets. Said two uprights or brackets 110 are transversely alined and paired with two spaced-apart uprights or brackets 114 slidably arranged on said supporting rails 111. Additional longitudinally disposed guide rails 115, 116 are secured to the uprights or brackets 114. The guide rail 109 is vertically adjustable on the upright or bracket 110 at the left hand end of the machine as viewed in Fig. 1, in addition to being adjustable on the remaining uprights or brackets 110 paired with uprights or brackets 114. It will be apparent that either or both guide-rails 115, 116 may be adjustably fastened to their supporting uprights or brackets. The adjustability of the guide rails enables bags of various heights to be passed through the machine in a properly guided manner. The guide rails 115, 116 cooperate with the guide rails 108, 109, respectively, to form a bag or package passage 117 extending from the table or platform 105 to the distant end of the machine. The guide rails 115, 116 are therefore shorter than the guide rails 108, 109 and thus arranged form an entrance opening to the bag or package passage directly over the table or platform 108.

During the rotation of the crank arm 91, the rod or pitman 93 is caused to reciprocate and by reason of the connection of said rod or pitman with the lever 94, said lever in turn causes reciprocation of the rod 96. Due to the rod 96 being pivotally connected with one of the slide headers, for example slide header 98, of the bag or package-feeding mechanism, and the tying-up of said slide header with the slide headers 100 and 101 by means of a tie-rod 118 (see Fig. 2), the pusher devices which constitute the slide headers and the pusher arms are moved back and forth in the direction of the length of the bag or package supporting rail or track 104. Lengthening or shortening of the rod 96 changes the area of the rail 104 over which the bags travel and enables bags of various cross-sectional dimensions to be transversely centered under the primary crimping, folding and sealing assembly, to be hereinafter described.

During the forward movement of the bag-feeding mechanism, of which said pusher devices form part, the pusher arms 102 are caused to oscillate on their pivots or centers and for this purpose the shaft or pivot of the slide header 98 at the extreme right, as viewed in Fig. 6, has a pinion 119 secured to its lower end, which pinion is in mesh with a gear wheel 120 rotatably mounted on the underside of the slide header last mentioned, and to said gear wheel 120 a lever 121 is secured which extends therefrom and has a guide roller 122 rotatably secured to its outer end.

Underneath the pusher arms of the slide headers is a switch-track 123 provided with parallel intermediate guide grooves 124, 125 separated by a bar 126. At one end of the switch-track a terminal or switch guide groove 127 is provided which is alined with the bar 126 and at the other end of the switch-track a terminal or switch guide groove 128 is arranged which is alined with the guide groove 125.

Switch tongues 129, 130 are pivotally attached to opposite ends of the bar 126 and these are normally spring-retained in any approved manner in positions connecting guide groove 124 with terminal or switch guide groove 128 and guide groove 125 with terminal or switch guide groove 127, as clearly shown in Fig. 8. The grooves 124, 125, therefore merge at opposite ends into the terminal or switch guide grooves 127 and 128.

The guide roller 122 is at all times positioned within some portion of the two-way switch groove assembly thus formed in the switch track and is adapted to travel back and forth. In its forward movement, indicated by the arrow 131 in Fig. 8, it travels from the terminal or switch guide groove 127 along the forward edge or face of the switch tongue 129 into the guide groove 125 and from the latter into the terminal or switch guide groove 128, momentarily moving the switch tongue 130 inwardly so as to permit the roller to enter said terminal or switch guide groove.

The action of the guide roller 122 thus far described takes place during one-half a revolution of the crank arm 91 and during the other half of said revolution said guide roller reverses its movement, traveling from the terminal or switch guide groove 128, along and in contact with the inner edge or face of the switch tongue 130, thence through the guide groove 124 and from the latter into the terminal or switch guide groove 127. During the last portion of its movement so described, the switch tongue 129 is moved forwardly so as to provide the necessary clearance for the passage of the guide roller 122 from the groove portion 124 to the terminal or switch groove portion 127. The switch tongues assume their normal positions under spring force, as above stated, so that normally they are retained in the positions shown in Fig. 8.

In traveling forward and back through the switch track, the guide roller 122 is caused to swing through an arc of a circle componently with its reciprocating movement and in range sufficient to rotate the gear wheel 120 on the slide header 98 and this movement of the gear wheel is sufficient to cause rotation of the pinion 119 to a degree that will cause the shaft of the pusher arm or arms supported on said slide header to oscillate from the position shown in dotted lines in Fig. 8 to the position shown in full lines in Fig. 6.

The pusher arms 102 of the several slide headers are connected together by means of a tie bar 132, or otherwise, so that they swing in unison; the bags A, during the several steps of closing and sealing the same, being advanced through the machine while supported on the rail or track 104.

As clearly shown by dotted lines in Fig. 6, a bag is located at the extreme left of the supporting rail or track 104 inwardly from the bag-receiving table or platform 105 and other bags are shown being advanced along said rail or track under reciprocating movement of the pusher arms 102. During the operation of the machine, the pusher arms 102, while in the positions shown in Fig. 6, are moved rearwardly or to the left and during this action the guide roller 122 travels through the switch track 123 and by reason of the circuitous course of travel by the roller in said track, the pusher arms are moved inwardly from the positions shown in full lines in Fig. 6

to those shown by dotted lines in Fig. 8. Thus, when positioned as shown by said dotted lines, they clear the bags on the supporting rail or track 104 and assume positions in a plane inwardly of the bags, with the result that as the spaced-apart slide headers move forward or to the right, as viewed in Fig. 6, the pusher arms will engage the left or rear sides of the bags and move them forward along the supporting rail or track the distance which such slide headers travel in a forward direction.

Eventually the bags, after being closed and sealed in a manner to appear hereinafter, contact each other at the right hand end of the supporting rail or track 104 and are moved from the latter onto a delivery table or platform 133, from which they are placed in containers for shipping, or otherwise disposed of.

The switch track has an opening 133a in its bottom for such commodities as beans and the like to pass through when over-spilled or when for any reason a bag becomes broken, and thus jambing of the mechanism is prevented.

Any commodities passing through the opening 133a will drop into a pan 134 slidable into and out of the base member 51 and closing the bottom of an elongated hopper-like receptacle 135 formed by a vertical rear wall 136 and a front wall 137 having a downwardly and rearwardly inclined upper portion 138 and a vertical lower portion 139, said walls 136, 137 extending the full length of the machine. Any commodities accumulating in the hopper-like receptacle may therefore be returned to the original supply and bagged; thus avoiding all waste.

When starting the machine in operation, the pusher mechanism will be at the extreme left of its movement when viewed as shown in Fig. 6. A partially filled bag will then be moved manually from the receiving table or platform 105 onto the package supporting rail or track 104, with the result that the pusher arm or arms of the slide header 101 will engage the rear side of the bag and move the latter from the position shown by dotted lines 140 in Fig. 6 to the position shown by dotted lines 141 in said figure. At this time one bag will be on its way along the rail or track 104. During such action, the pusher arm or arms of the slide headers 100 and 98 will move idly in a forward direction, or from left to right as viewed in Fig. 6. During the return movement of the pusher mechanism, the pusher arm or arms of all slide headers will be swung inwardly or in a direction toward the rear of the machine, in which positions they will be retained until the pusher mechanism approaches the end of its return movement. During the final portion of its return movement the pusher arms of the plurality of slide headers are swung in an outward direction to a limited degree preparatory to further movement outwardly during the initial forward or advance movement of the pusher mechanism. As the pusher mechanism reaches its rearmost position, the attendant will move another partially-filled bag from the receiving table or platform 105 onto the rail or track 104 in advance of the pusher arm or arms of slide header 101 and with all pusher arms directed outwardly, or in the positions shown in Fig. 6, the pusher mechanism is moved in a forward direction, during which action the bag shown by dotted lines 141 in said figure is moved to the position of the bag shown by dotted lines 142 and the bag shown by dotted lines 140 is moved to the position of the bag shown by dotted lines 141. At this time two bags are on the rail or track for advancement through the machine.

On the return movement of the pusher mechanism, the bags indicated by dotted lines 141 and 142 will be by-passed by the pusher arms of slide headers 100 and 98, respectively, and a third partially-filled bag will be positioned forward of the arm or arms of slide header 101. As the pusher mechanism is again moved forwardly, the bag in the position shown by dotted lines 142 will be moved to the position indicated by the dotted lines 146; the bag occupying the position indicated by dotted lines 141 will be moved to the position indicated by dotted lines 142, and the newly positioned partially-filled bag indicated by dotted lines 140 will be moved to the position shown by dotted lines 141. It will be apparent that, at this time there are three bags being advanced in spaced-apart relation along the rail or track.

After the next return movement of the pusher device a fourth partially-filled bag having been placed on the receiving platform 105 is moved onto the rail or track in advance of the pusher arm or arms of slide header 101 and during the following forward movement of said pusher mechanism all bags on the rail or track are advanced in the manner stated; the bag advanced to the position indicated by the dotted lines 146 in Fig. 6 being moved directly by a bag following it the distance of the width of each bag so that after the bags reach the positions indicated by dotted lines 103, they are advanced while in contact, one with another, and are moved onto the delivery table or platform 133, where, as above indicated, they are removed and stored, shipped, or otherwise disposed of.

When the bags are successively positioned at the point indicated by dotted lines 142 in Fig. 6, crimping or gusset-folding mechanism 143, flap-folding mechanism 144, and the fold-gaging mechanism 145 will be brought into action. The bags so positioned will be transversely and centrally in line with a crimping, folding and sealing assembly formed by said mechanisms 143, 144 and 145 and be advanced step-by-step along the bag or package supporting rail or track 104 in the manner described during each reciprocating movement of the pusher mechanism, with the result that the bags will eventually assume the positions shown by dotted lines 146, Fig. 6, at which point supplemental folding, and sealing mechanism 147 is brought into action, when the bags, due to the nature of the material therein, require additional folding and sealing of the same. As the position of the bags indicated by dotted lines 146 is the last step of their passage through the machine by direct operation of the pusher mechanism thereagainst, the bags, as above stated, are assembled at the discharge end of the bag or package supporting rail or track 104 and are forced out of the machine while in contact with each other and are delivered onto the delivery table or platform 133.

It will thus be seen that the feeding of the bags through the machine is a successive operation and is accomplished under action of the crank arm 91 and mechanism transferring movement from said crank arm to the slide headers 98, 100, and 101 which, with the pusher arms 102 of said headers, the switch track 123, and the mechanism intermediate said slide header and switch track constitute package or bag feeding mechanism. Each slide header and its pivotally attached pusher arm or arms, may for convenience, be termed a "pusher device," and the pusher de-

vices with parts attached thereto may be referred to as the pusher mechanism of the machine.

The bags are, therefore, advanced through the bag or package passage 117 step-by-step under reciprocating movement of said slide headers and under control of the lever 121 and its guide roller 122 in coaction with the movement-transferring mechanism between said lever and at least one of the slide headers, in conjunction with the switch-track provided for causing actuation of the pusher arms of the slide headers.

As clearly shown in Figs. 4, 31 and 32, each pusher device is preferably provided with a plurality of arm-sections, four being shown in the two last-mentioned figures. The arm-sections mounted on the slide header 98 are secured to the shaft to which the pinion 119 is secured so that when said pinion is rotated counter-clockwise and clockwise, the arm-sections of said pusher device will have been oscillating to complete a full cycle of movement. Thus the commodities or wares within the bag will not be subjected to pressure along the full height of the bag, and if desired, one or more arm-sections of each of these pusher devices may be omitted, depending on the height of the bags passing through the machine, and at times on the material being bagged.

Provision is also made for raising and lowering the bag or package supporting rail or track 104, and for this purpose the rail or track is provided with depending arms 149 having a vertical series of teeth serving as a gear rack 150; each of the depending arms being slidable within a housing 151 secured to the longitudinal connector member 57, or otherwise. The arms 149 extend downwardly from the supporting rail or track near opposite ends thereof. Mounted in each housing is a shaft 152 having a pinion 153 secured thereto in mesh with the gear rack 150 and having also a sprocket wheel 154 fastened thereto. Traveling over the sprocket wheels 154 is a sprocket chain 155 (see Fig. 1). The shaft in one of said housings 151 has a knob or handle 156 secured thereto for rotating the shafts 152 and causing the pinions 153 beneath opposite ends of the supporting rail or track to raise and lower the arms 149 and thereby raise or lower the supporting rail or track 104.

The shaft 152 having the knob or handle 156 secured thereto has a ratchet wheel 157 fastened thereon which is engaged by a lock dog 158 secured to a shaft 159 having a handle by means of which the lock dog may be disengaged from the ratchet wheel and thus the shaft 152 freely rotated for adjusting the supporting rail or track 104 vertically so as to accommodate bags of different heights passed through the machine. It will thus be seen that the bag or package-supporting rail or track 104 may be elevated and lowered in relation to the guide rails 108, 109, 115 and 116.

Adjustment of the width of the bag or package passage 117 over the supporting rail or track 104 may be effected to increase or diminish the width of said passage by moving the uprights or brackets 110, 114 to which the guide rails 108, 109, and 115, 116, respectively, are attached towards or away from a plane passing longitudinally through the center of the rail or track 104; and for this purpose an adjusting screw or rod 160 (see Fig. 3) is rotatable in bearings 160^a, 160^b and threaded through each pair of transversely alined uprights or brackets 110, 114. A third and shorter adjusting screw or rod 160^c, best shown in Fig. 6, is adjustable in suitable bearings 160^d carried by the end member 53 of the frame, or otherwise supported, and this third and shorter adjusting screw or rod is for adjusting the single bracket 110 at the bag-receiving end of the machine. The portion of each adjusting screw or rod passing through one of each pair of transversely alined uprights or brackets is provided with a left-hand screw thread 161, while the portion passing through the other of each pair of said transversely alined brackets is provided with a right-hand screw thread 162, as best shown in Fig. 3. A portion of said third or shorter adjusting screw is also provided with left-hand screw threads to conform to the left-hand screw threads of the adjusting screws or rods provided for adjusting the brackets 110 transversely alined with brackets 114. Thus, in rotating the adjusting screw or rod of the pair of brackets at the right-hand or delivery end of the machine by means of a hand wheel 163, accessible from the front of the machine, the adjusting screw or rods may be turned in one direction to increase the width of the passage 117 or in the opposite direction to diminish the width of the same, as will presently appear.

From the foregoing it will be clear that the uprights or brackets 110 having the guide rails 108 and 109 secured thereto, form the inner or rear wall of the bag or package passage 117 and that the uprights or brackets 114 having the guide rails 115, 116 attached thereto form the front or outer wall of said passage; the inner or rear wall being extended beyond the outer or front wall at the bag-receiving end of the machine, while uprights or brackets 114 form the outer or front wall of said passage and provide an opening at the receiving end of the machine in line with the receiving table or platform 105.

So that the adjustment may be equalized along the entire length of the passage, the adjusting screws or rods 160 and the adjusting screw or rod 160^c have sprocket wheels 164 secured thereto over which a sprocket chain 165 is passed. However the adjusting screw or rod 160^c for the upright or bracket 110 at the extreme left or bag-receiving end of the machine is provided with a left-hand thread only, since it functions to adjust said bracket so as to move the same in unison with the brackets 110 longitudinally alined therewith. To maintain the sprocket chain 165 in mesh with the sprocket wheels 164, an idler sprocket wheel 166 (see Fig. 2) is rotatably mounted on a shaft receiving support from the longitudinal connector member 57, thus taking up slackness in said chain which would otherwise occur because of the length of the same.

In some instances I find it advisable to attach pressure fingers 167 to the outer guide rails 115, 116 of the bag or package passage 117 and these are comparatively resilient and arranged to exert slight pressure inwardly so that the bags or packages travel in contact with the straight-edge guide rails 108, 109. For this purpose flat plates 168 may be secured to the outer sides of the outer guide rails 115, 116, or to either of them, so that they have the resilient pressure fingers 167 occupy the space between the upper and lower outer guide rails, as clearly shown in Fig. 1.

As stated, the pusher devices are connected together by the tie-rod 118 so that when the pusher device at the right of the bag pusher mechanism is actuated by the guide roller 122 traveling in the switch-track 123, the remaining pusher devices 100, 101 will be actuated. The pusher arms of the pusher devices 98 and 100 are pivotally connected together by the tie-bar

132 and the latter is in yielding contact with the pusher arm or one of the arms of the slide header 101 at the left of the pusher mechanism. The extreme left hand end of the tie-bar 132, as shown in Figs. 6 and 33, abuts against the pusher arm or one of the pusher arms of the slide header 101 and is so maintained by a long retractile spring 170 having one end secured to said last-mentioned arm and its other end connected to said tie-bar a distance from its free or abutting end. Thus the pusher assembly, when moved to its position at the extreme left, as viewed in Fig. 1, will cause the pusher device 102 at the extreme left to engage a bag or package delivered onto the bag or package supporting rail or track from the receiving table or platform 105 and will assure continued operation of the machine, even though advancement of the bag at the extreme left is not made due to the operator coming in contact with the pusher arm or arms of said left-hand pusher device, or for other reasons, and when such a condition arises, the pusher arm or arms of the remaining pusher devices will be swung on their pivots while straining the long retractile spring 170. Thus the remaining pusher devices of the pusher assembly will function properly and intermittent forward movement of the packages or bags will be effected without any possibility of the operator's hand being injured, or operation of the machine being affected. The bag at the extreme left being so momentarily held against advancement may be manually moved forward in the passage 117 after the operator's hand is withdrawn from contact with the pusher arm or arms intended to actuate said package, in which event the packages will be properly spaced apart and remain so spaced while the pusher arms of all pusher devices recede and return to their normal or inoperative positions.

It will be apparent, therefore, that with each forward movement of the pusher assembly, the pusher arms engage the bags or packages mounted on the rail or track 104 and advance the same a predetermined distance; momentarily retaining the bags in such positions for operation thereon, while in one position, by other mechanisms to be presently described. The pusher mechanism functions in the manner of a ratchet mechanism, in that when moved in one direction it advances the bags through the passage 117 and when moved in the opposite direction travels idly inwardly of the bags to enable it to again engage and push the bags in a forward direction. When the bags are positioned for closing and sealing the same, the pusher assembly will be returning to its normal position and for a period of time, governed by the cams on the driving or countershaft 70, will be so retained until certain closing and sealing operations have been effected.

Secured to the underside of the bag or supporting rail or track 104 is a vibrator 171 of any common type, controlled by a switch 172 through suitable current-conducting wires; the purpose of this vibrator being to cause the rail or track 104 to vibrate and compact the contents of the bag or package supported thereby.

The rock lever 78 has the lower end of a rod 173 pivotally connected to the outer or forward end of the arm 78a; said rod being lengthwise adjustable and for this purpose is formed of two sections, as best shown in Fig. 4, one section being threaded into the other so that the rod may be shortened or lengthened, as may be desired. The upper end of the rod 173 is secured to the outer end of one arm of an angle lever 174 rockable on a rod or fixed shaft 175 extending longitudinally of the machine and having one end fastened in the end frame member 54 and its other end in the intermediate frame member 99. The other arm of said angle lever 174 has one end of a link 177 pivotally connected thereto, the other end of which is pivotally connected to the flap-folding mechanism 144 designed to flap-fold the upper open ends of bags after crimping or gusset folding the same, as will appear hereinafter; said mechanism forming part of the primary crimping, folding and sealing assembly of the machine.

Pivotally connected to the rock lever 79, and more particularly to the outer end of the arm 79a of said lever, is a rod 179, which extends upwardly and forwardly and has its upper end pivotally connected to a lever 180 secured to a transverse shaft 181 (see Figs. 1 and 2) which is journaled in a bearing 182 fastened to the top frame member 55 and designed to actuate other parts of the primary crimping, folding and sealing assembly, which parts I prefer to term crimping or gusset-folding mechanism and which I have hereinbefore designated by the numeral 143.

Pivotally connected to the rock lever 80, and more particularly to the outer end of the arm 80a thereof, is a rod 184 which extends upwardly and has pivotal connection at its upper end with the fold-gage mechanism 145.

Pivotally connected to the rock lever 81, and more particularly to the outer end of the arm 81a thereof is a rod 186 which extends upwardly therefrom and at its upper end is pivotally connected to the supplemental folding and sealing mechanism 147.

The transverse shaft 181 extends through the bearing 182 on the top frame member 55 and at the outer side of said member has a lever 188 secured thereto, the outer or free end of which is pivotally connected to the lower end of a link 189 whose upper end is pivotally secured to a slide plate or carrier 190 vertically reciprocable in guides 191 fastened to the front face of the top frame member 55. This slide plate or carrier forms part of the crimping or gusset-folding mechanism 143 which includes a frame 192 secured to the bottom of said slide plate and having two pairs of spaced-apart wire fingers or gages 193, 194 depending therefrom. Said frame also has pivotally secured thereto crimping or gusset-folding arms 195 which are retained in vertical position at opposite sides of the wire fingers or gages 193, 194 and these crimping or gusset-folding arms are disposed in a plane between each of the two pairs of wire fingers 193, and 194. When said slide plate or carrier 190 is lowered by action of the lever 188, said crimping or gusset-folding arms are swung inwardly between each pair of wire fingers or gages and while so positioned, the flap folding and sealing mechanism 144 is brought into action.

It is, of course, understood that with the parts of the crimping and gusset-folding mechanism in the positions shown in Fig. 17, a bag reaching the position indicated by dotted lines 142 in Fig. 6 will be directly beneath said crimping and gusset-folding mechanism and in a plane in rear of the flap-folding mechanism 144 and forward of the fold-gaging mechanism 145; the bag having the free upper ends of its walls extending above the contents thereof and forming a rectangular void or open space into which the wire fingers or gages 193, 194 are entered upon downward movement of the slide plate or carrier 190, as best shown in Figs. 14 and 22. When so entered, the crimp-

ing and gusset-folding arms 195 are located outside of the free ends of two opposite walls of said bag, as best shown in Fig. 22. Thus when said arms are swung inwardly, said walls are crimped or folded between each of the two pairs of wire fingers or gages 193, 194, as best shown in Figs. 14 and 23 and are so maintained until acted upon by other mechanism forming part of the crimping, folding and sealing assembly.

The crimping or gusset-folding arms 195 are held in their vertical or outer positions by retractile springs 196, so connected to the frame 192 and to said arms that the latter are held off-center when in such positions.

The crimping or gusset-folding arms have inwardly-extending arms 197 provided with forwardly-directed toes 198, the ends of which latter travel between spaced-apart upper and lower stop bars 199, 200 secured to a bracket 201 depending from the longitudinal top frame member 55, or otherwise fastened in a fixed manner. Thus when the slide plate or carrier 190 and the frame 192 carried thereby are lowered, the two pairs of wire fingers or gages 193, 194 enter the open upper end of the bag, while the crimping or gusset-folding arms 195 are moved to positions outside of opposite free upper end portions of the walls of said bag until the forwardly-directed terminal arms 198 engage the lower stop bar 200, whereupon said crimping or gusset-folding arms are swung inwardly against the resistance of the retractile springs 196, forcing each of opposite free wall portions of the bag inwardly between each of the two pairs of wire fingers to crimp or gusset-fold said wall portions in the manner shown diagrammatically in Fig. 23; said arms being so held until the slide-plate or carrier 190 moves upwardly, under the control of the cam 73 and strikes the upper stop bar 199, at which time said arms are swung outwardly to their normal positions, the springs 196 accelerating the final portion of the swinging movement of said arms.

It is understood that due to the operative connection of the slide plate or carrier 190 with the cam 73 on the counter or driving shaft 70, said slide plate or carrier is moved through a complete cycle of movement during each revolution of said cam.

The range of oscillating movement of the crimping or gusset-folding arms 195 is controlled by providing said arms with inwardly-directed toes 202 disosed above their pivotal points and inwardly-directed toes 203 disposed below such pivotal points; stop screws being adjustably threaded through said toes 202, 203 and arranged to strike the upper and lower edges of a cross bar 192a forming part of the frame 192 to which slide plate or carrier 190 is secured. Upon adjusting these stop screws, the swinging movement of the crimping and gusset-folding arms may be increased or diminished to meet the requirements of larger or smaller bags being passed through the machine, while the wire fingers or gages 193, 194 are inwardly entered in the upper open end of the bag and the crimping or gusset-folding arms 195 are swung inwardly between the pairs of said wire fingers or gages in the manner shown in Figs. 14 and 23. Portions of opposite side walls of the bag are thus crimped or folded inwardly, while the intervening side walls are momentarily held separated in close relationship by the wire fingers or gages lying in contact with the inner sides of said walls.

As the wire fingers or gages 193, 194 and the crimping or folding arms 195 are being moved upwardly with the slide plate or carrier 190, the flap-folding mechanism 144 is moved rearwardly and the fold-gage mechanism 145 forwardly under the action of their respective actuating cams 72 and 74, under which action the crimped or gusset-folded upper end of the bag is gripped between said two mechanisms.

The flap-folding mechanism 144 is carried on a fixed shaft 204 and the link 177 is pivotally connected to a cam member 205 forming part of said mechanism and rockably mounted on said fixed shaft. Rotatable on said fixed shaft 204 is a sleeve 206 which bears at one end against said cam member and at its other end against a hanger 207 depending from and fastened to the longitudinal top frame member 55.

A collar 208 is secured to the shaft 204 and bears against the cam member 205. Thus all parts of the flap-folding mechanism are carried by the fixed shaft 204 and confined between the collar 208 and the hanger 207 or some other fixed portion of the frame.

Clamped or otherwise fastened on one end of the sleeve 206 so that it is flush with one end edge of said sleeve and also bears against the cam member 205, is a tensioning rock collar 209. Secured to the sleeve 206 are the upper ends of two spaced-apart arms or side members 210, in the lower ends of which a rock shaft 211 is mounted. The shaft 204, the sleeve 206 rotatably mounted on said shaft, the arms or side members 210 secured to said sleeve in spaced-apart relation, the tensioning rock collar 209 secured to said sleeve and the cam member 205 yieldingly connected with said tensioning rock collar constitute what I term the rockable primary or main frame of the flap-folding mechanism.

Secured to said rock shaft 211 is the lower end of a rockable auxiliary frame which includes side arms or frame members 214 disposed outside of the arms or side members 210 of the rockable primary or main frame and extending upwardly from said shaft 211. 215 designates a link having its lower end pivotally connected to the outer end of an arm 216 whose inner end is secured to the rock shaft 211, said link having its upper end pivotally secured to an arm 216a projecting outwardly from the hanger 207. This link connection assures a straight-lined inward movement of the flap-folding mechanism.

The cam member 205 has a spring-loaded lug 217 extending forwardly and upwardly therefrom in a plane above the axis of the fixed shaft 204 and the tensioning rock collar 209 has a similarly disposed lug 218 extending therefrom beneath the lug 217 and in spaced relationship thereto.

The lug 218 has a screw-stud 219 fastened thereinto and extending upwardly through lug 217, and surrounding said screw-stud between said lugs 217 and 218 is a spiral spring 220, the tension of which is regulated by means of a nut 221 threaded onto the upper end of said screw stud and bearing against the upper face of lug 217. Thus by reason of the tensioning rock-collar 209 being secured to the sleeve 206 and the cam member 205 being loosely mounted on the shaft 204, said cam member is normally held in its rearmost and uppermost position, as best shown in Fig. 35.

Fastened between the side arms or frame members 214 of the rockable auxiliary frame is an electric heater 222 of any suitable type, to which is pivotally secured a fold bar 223 adapted to

move from the position shown in Fig. 13 to that shown in Fig. 16, and to the pivot or shaft 223a of said fold bar outside of one side arm of the rockable auxiliary frame, a pinion 224 is secured. This pinion is in mesh with a gear segment 225 secured to one end of a shaft 226 rockable in the upper or free ends of the side arms 214 of said rockable auxiliary frame. Said gear segment 225 has a forwardly extending roller supporting arm 227, on the front or outer end of which a roller 228 is rotatably secured; said roller being retained in contact with the cam edge 229 of the cam member 205.

Secured to the rockable shaft 226 is a collar 230 to which one end of a torsion spring 231 surrounding said shaft is secured, the other end of said spring being secured to one of the side arms or frame members 214 of the rockable auxiliary frame. Thus, when the rod 173 is actuated by the cam 72, the rockable main frame and the rockable auxiliary frame are caused to rock on their centers and in turn cause the flap-folding mechanism, forming part of the crimping, folding and sealing assembly, to be brought into action. The flap-folding mechanism thus described consists of the rockable main frame on shaft 204, the auxiliary frame rockable with the rock shaft 211, and parts carried by said frames.

The rockable auxiliary frame comprises the rock shaft 211 rotatably mounted in the lower or outer ends of the arms or side members 210 of the rockable primary or main frame, the side arms or frame members 214 secured to said rock shaft, the rock shaft 226, the pinion 224, the gear segment 225 with its roller supporting arm, and the torsion spring 231 and its associated collar 230, all controlled by the action of the cam member 205.

The fold-gage mechanism 145 is carried by the rod or fixed shaft 175 and comprises a sleeve 233 rockable on said rod or shaft and spaced-apart downwardly and rearwardly trending arms or frame members 234 having their upper ends clamped or otherwise secured to said sleeve. At least one of said arms or frame members has an upwardly and rearwardly extending arm 235 projecting therefrom to which the upper end of the rod 184 is pivotally connected; said rod being actuated by the cam 74 through the medium of the rock lever 80.

Journaled in the lower ends of the arms or frame members 234 is a rock shaft 236 having angular fittings 237 secured thereto to which forwardly extending arms 238 are fastened in any suitable manner; said angular fittings 237 and arms 238 are spaced apart and at their forward ends are connected by a gage wire 239. Arranged inside and adjacent the arms or frame members 234 and rockable with the rock shaft 236 are levers 240, the levers being mounted between their ends on the rock shaft 236 so as to provide rearwardly extending arms 241 and forwardly extending arms 242. Each arm 241 has an inwardly projecting lug 243 through which an adjustable stop screw is threaded; said stop screws normally abutting against stop lugs 245 projecting from the rear edge of the arms or frame members 234 and being so held by retractile springs 246 secured at their lower ends to the rear ends of the arms 241 and their upper ends to lugs 247 projecting rearwardly from the arm or frame members 234. Secured in the front ends of the arms 242 is a rock shaft 248 and fastened to said shaft are spaced-apart angular fittings 249 to which the rear end or forwardly projecting arms 250 are secured; the front ends of which are connected by a gage wire 251.

Fastened to the rock shaft 248 is a stop arm 252 which projects rearwardly therefrom and overlies the rock shaft 236; said stop arm having a stop screw 253 threaded adjustably therethrough and engaging with its lower end against the rock shaft 236, thus limiting the upward movement of the gage member 254, comprising the fittings 249, the forwardly projecting arms 250 and the gage wire 251. A retractile spring 255 is connected at its lower end to an angular fitting 249 and at its upper end to an arm or frame member 234. The retractile spring 255 serves to swing the gage-member 254 upwardly while the stop screw 253 limits the upward swinging movement of said gage member. The angular fittings 237, the arms 238, and the gage wires 239 also constitute a gage member, which I have designated by the number 256, and the gage members 254 and 256 are normally held in the positions shown in Figs. 13 and 14. I have in some figures of the drawing shown one retractile spring 246, one retractile spring 255, and one lug 243 with its stop screw; and in other figures, two such springs and lugs are shown. This makes it apparent that either one or two of each of such parts may be employed.

Fastened to the rock shaft 248 at one side of the frame of the fold-gage mechanism 145 is a trip lever 257 and on the pivot or shaft 233a of the fold bar 223 is a trip arm 258 adapted to engage and trip the lever so as to rock the gage member 254, for a purpose to appear hereinafter.

It will be clear from the foregoing, therefore, that the cams 72, 73, 74 and 75 are synchronized in action and that each cam has a concentric portion or portions under control of which mechanisms operated by it as a unit are momentarily held in immovable position, parts of the mechanisms controlled by cams 72, 74 and 75 being brought into action during such times to serve their respective purposes. The concentric portions of the cam 73 serve to momentarily hold the crimping and gusset folding mechanism in elevated and lowered positions, respectively, and parts of such mechanism are actuated during the ascending and descending movements thereof. The cam 73, through the intervention of the rock lever 79 actuates rod 179, lever 180, transverse shaft 181, lever 185 and link 189 so as to operate the slide plate or carrier 190, which in turn lowers the wire fingers or gages 193, 194 and the crimping or gusset-folding arms 195 attached thereto, causing said fingers or gages to enter the open end of the bag and the crimping or gusset-folding arms to assume positions outside of and at opposite sides of the free upper wall portions of the bag.

During the lowering of the wire fingers or gages 193, 194 and arms 195, the forwardly-directed toes 198 of the arms 197 are caused to engage the lower stop or stop bar 200 and thus swing said arms inwardly between the two pairs of wire fingers or gages 193, 194, forcing the upper free ends of the side walls of the bag inwardly between said wires or gages to crimp or gusset-fold the same, as shown in Figs. 14 and 23. This action occurs during a portion of each revolution of the cam 73, and the parts so actuated are momentarily retained in actuated positions during the immediately following portion of each revolution of the cam. At such times the slide plate or carrier is in its depressed position and during the next

following portion of the revolution of the cam 73, the slide plate or carrier 190 is caused to ascend to its uppermost or normal position, during which action the forwardly-extending toes 198 contact the upper stop or stop bar 199 and cause the crimping or gusset-folding arms 195 to be returned to their normal positions, in which positions said arms are retained until the slide plate or carrier is again depressed and reaches a point at which the forwardly extending toes 198 thereof engage the lower stop or stop bar 200 and again cause the arms 195 to swing inwardly or toward each other and thus crimp or gusset fold the upper free wall portions of a partially filled bag.

When the wire fingers or gages 193, 194 are entered in the upper open end of a bag and the crimping or gusset folding arms 195 are swung inwardly to crimp or gusset fold a bag in the manner described and as shown in Figs. 14 and 23, the front and rear free wall portions at the upper end of the bag are moved toward each other. The relationship of the several cams on the driving or countershaft is such that at this time the flap-folding mechanism 144 and fold-gage mechanism 145 are swung into contact with said last-mentioned wall portions to press them together, utilizing the electric heater 222 as a contact or pressure member engaging the front of the bag above the contents therein and the gage wires 239 and 251 as counteracting pressure elements contacting the inner wall of the bag above the contents therein and pressing the free wall portions of the bag against the electric heater 222 and at the same time establishing a line along which the gusset-folded wall portions extending upwardly above the contents of the bag are folded; said gage wires 239 and 251 contacting the bag in spaced-apart relation, as best shown in Fig. 15.

From the foregoing it will be apparent that the flap-folding mechanism 144 is moved inwardly in operating relation to the bag under the action of the link 177 drawing the same toward the bag, said link being actuated under operation of the cam 72 on the driving or countershaft 70. The inward movement of the flap-folding mechanism toward the bag is definitely fixed with regard to the size of the bag being operated upon and for this purpose one or both arms or side members 210 are provided with inwardly-extending lugs 259 at their upper ends through which a stop screw 260 is passed which is adjustably held within said lug and is adapted to strike a stop element 261 carried by the bracket 201, or otherwise. The degree of extension of said stop screw upwardly from said lug determines the range of the inwardly swinging movement of the flap-folding mechanism 144 and said stop screw or screws, as the case may be, has a further purpose in that it limits the rockable movement of the primary or main frame of the flap-folding mechanism, while permitting independent action of the rockable auxiliary frame of said flap-folding mechanism, the independent movement of said rockable auxiliary frame following the movement of the rockable primary or main frame. After the inward movement of the primary or main frame is arrested by the stop screw or screws 260 engaging the stop element 261, the cam 72 continues to exert pulling action on the link 177, with the result that the cam member 205, to which said link is pivotally secured, is drawn inwardly and in turn through its action on the roller 28 carried by gear segment 225 causes said gear segment to rotate the pinion 224 and as said pinion is secured to the pivot or shaft 223a of the fold bar 223, said bar is caused to turn and depress the free upper ends of the pressed together gusset-folded walls of the bag and cause said ends to be folded over the gage wire 251, while the gage wire 239 beneath the wire 251 establishes a fold line pressing downwardly and inwardly against the covered contents of the bag. Thus a transverse fold is formed along the top of the bag in horizontal alinement with the underside of the heater, or approximately thereto, as shown at 262, Figs. 16a and 16b. As the fold bar 223 has its pressure face 223a swinging toward the inner side or face of the heater 222, the trip arm 253 on the pivot or shaft 251 of the fold bar 223 will engage the trip lever 257 on the fold-gage mechanism 145 and cause the gage wire 251 to swing downwardly out of the portion of the walls of the bag being folded, as clearly shown in Fig. 16a. By the time the fold is completed in the manner shown in Fig. 16b, the gage wire 251 will have been withdrawn from the fold and will have closely approached the gage wire 239, both of which are now in positions to move rearwardly away from the bag as the fold-gage mechanism 145 is swung in that direction under action of its associated cam 74.

Since the bags are made of cellophane, wax-coated material, or some other suitable material that will be self-sealing under application of heat, the folds established under action of the fold bar 223 will be sealed, since when folded in the manner shown in Fig. 16b the fold will be thoroughly heated by the heater 222 and by the heat of the fold bar, established by induction from said heater.

Under the final portion of each revolution of the cams 72 and 74, the flap-fold mechanism 144 and the gage-fold mechanism 145 are swung away from each other and during this time the secondary frame member will be returned to normal position within the primary frame member of the flap-folding mechanism under action of the spring 231, and such independent action caused by said spring will result in the gear segment 225 returning the fold bar 223 from position shown in Figs. 16 and 16b to the position shown in Figs. 13 and 14.

As clearly shown in Fig. 16b and Fig. 26 a single sealed fold or flap-fold 262 will have been formed in which the wall portions in contact with each other and the folded parts of said wall portions will adhere to each other and the bag will not only be properly closed but will be sealed in an air-tight manner; the free ends of the bag walls extending at a right angle to the single sealed fold 263 in the form of a free terminal 264. The sealed flap-fold so formed extends upwardly from the top of the closed bag.

For most kinds of commodities the closing and sealing of the bag in the manner shown in Fig. 16b, or as shown in plan view in Fig. 26, is considered to meet all requirements. In some instances, however, a fold or flap-fold projecting upwardly from the closed bag is not considered desirable and for this reason, the bags being carried through the machine step-by-step may be subjected, when required, to the action of the supplemental folding and sealing mechanism 147 which is disposed above the line of travel of the bags through the machine and is brought into action against the bags when the latter reach the positions indicated by dotted lines 146 in Fig. 6.

When in such positions, the bags are centrally disposed underneath the supplemental folding and sealing mechanism. The upper end of the

rod 186, which has its lower end pivotally connected to the rock lever 81, is pivotally connected to a lever 265 which in turn is pivotally connected between its ends, as at 266, to the lower end of a bracket 267 (see Fig. 2), depending from the rod or fixed shaft 175 to which said bracket is secured in any approved manner. At the end of the lever 265 opposite that to which the rod 186 is pivotally connected, an electric heater 268 is secured, the weight of which tends to maintain said heater in depressed position, but said heater is held elevated by the cam 75 on the driving or countershaft 70.

On the bracket 266 a flap or flap-fold turning shoe 269 is secured which depends from the bracket a distance beneath the lower end of the electric heater 268 when said heater is elevated.

As the bags travel through the bag or package passage 117 after being flap-folded by the flap-folding mechanism 144, the flap fold formed as shown in Fig. 16^b engages the forwardly sloping under side 270 of said flap or flap-fold turning shoe so as to turn the sealing flap 263 downwardly in the manner illustrated in Figs. 28 and 29, until the said single sealing flap is folded over and pressed downwardly to assume the position shown in Fig. 30. While the bag is moving and leaving said flap or fold turning shoe, the electric heater 268 controlled in action by the cam 75 gravitates under its own weight, forcing the closed top of the bag downwardly against the goods or commodities in the bag and causing a double seal to be formed with a flat closure fold 271, as clearly shown in Fig. 30. When, however, a single sealed fold, such as 263, is sufficient to meet the requirements of folding and sealing the bags, the supplemental folding and sealing mechanism 147 and the actuating parts associated therewith are dispensed with.

It is apparent that it is within the province of my invention to substitute crimping or gusset-folding mechanism, flap-folding and sealing mechanism, as well as fold-gage mechanism constructed differently from those herein illustrated and described, and yet remain fully within the scope of the appended claims and that mechanism different from that illustrated and described serving as supplemental folding and sealing mechanism may be employed for double sealing packages or bags without departing from the scope of my invention as defined in said claims.

It will also be apparent that certain parts of my improved bag packaging machine may be employed without utilizing other parts shown and described as associated with said certain parts, since, basically considered, some kinds of commodities or goods may not require sealing of the bags and the closing of the same by folding the upper open ends of the partially filled bags may suffice. For this reason the term "bag closing machine" is sometimes employed in the appended claims.

Where the closing of the bags is sufficient without sealing the same, the bags may be constructed of paper or other material which is not self-sealing under the application of heat, pressure, or for other reasons when two layers of the material are brought into contact with each other. At times it may be found desirable to close bags by flap-folding only, without sealing in the manner illustrated in Figs. 16^a and 16^b. Bags so folded may be delivered from the machine and by means of stapling machines or devices, the flap-folds so formed may be stapled to hold them in folded condition.

Stapling or other fold-retaining mechanism may be embodied in the construction of the machine without departing from my invention or sacrificing any of the advantages thereof in so far as the method of folding and the means for so folding the open ends of bags are concerned, when construed in accordance with the appended claims.

Having thus described my invention what I claim is:

1. In a bag closing machine, a bag supporting rail, a guide element parallel with said rail, pusher mechanism reciprocal on said guide element and having at least three pusher arms pivotally connected thereto in spaced-apart relation, a tie bar pivotally connecting the forward and intermediate pusher arms together and extending rearwardly from said intermediate pusher arm to the rearmost pusher arm, said rearmost pusher arm being normally in contact with the rear end of said tie bar, a retractile spring connected to said rearmost pusher arm and to said tie bar a distance forward of the rear end of the latter, and means to cause said pusher arms to move in unison, said means actuating said pusher arms to swing the same into bag-engaging position while said pusher mechanism travels in one direction and to swing said pusher arms out of bag engaging position while said pusher mechanism swings in its opposite direction whereby the bags are advanced intermittently in a forward direction under ratchet action of said pusher mechanism, and means to close said bags as they reach a predetermined station along said supporting rail.

2. In a bag closing machine, a suitable support, gusset-folding mechanism guided for vertically reciprocating movement on said support and having two pairs of spaced-apart gages depending therefrom adapted to enter the upper open end of a partially filled bag to be closed, gusset-folding arms adapted to extend downwardly alongside opposite free upper end walls of said bag in a plane passing between each of said two pairs of gages when the latter are entered in said bag, and means to cause said gusset-folding arms to swing inwardly when said gusset-folding mechanism reaches a predetermined point in its descending movement to thereby fold opposite walls of said bag inwardly between said two pairs of gages, and flap-folding mechanism brought into action to fold the gusset folding portions of the walls of said bag upon themselves after said gages are withdrawn and said gusset-folding arms are moved outwardly during a predetermined portion of the ascending movement of said gusset-folding mechanism.

3. In a bag closing machine, a suitable support having guides, a slide vertically reciprocable in said guides and having a frame at its lower end, two pairs of gage elements depending from said frame member and having the elements of each pair spaced-apart and adapted to enter the unoccupied space at the upper end of a partially filled bag, gusset-folding arms pivotally connected to said frame and having trip toes extending therefrom, spaced-apart elements between which said trip toes are movable and upon contact with one of which said gusset-folding arms are swung through an arc of a circle to gusset-fold opposite free wall portions at the upper end of said bag and upon contact of the other of said spaced-apart elements said gusset-folding arms are swung outwardly away from said wall portions,

means to increase or diminish the swinging movement of said gusset-folding arms, and flap-folding mechanism following in action that of said gusset-folding mechanism to fold over the gusset-folded portions of the bag at a predetermined point in the ascending movement of said gusset-folding mechanism.

4. In a bag closing machine, a suitable support having guides, a slide vertically reciprocable in said guides and having a frame member transversely disposed at its lower end, two pairs of spaced-apart gage wires depending from said frame member and adapted to enter the upper open end of a partially filled bag, gusset-folding arms pivotally secured to said frame member and upon downward movement of said slide member being positioned outside of opposite free wall portions at the upper end of said bag, said gusset-folding arms being disposed in a plane passing between each pair of said gage wires, spaced-apart bars carried by said support and adapted to cause said gusset-folding arms to swing inwardly between the wires of each pair of gage wires with the material of the bag during the descending movement of said slide plate and to cause said gusset-folding arms to be moved outwardly at a predetermined point in the upward movement of said slide plate, springs to maintain said gusset-folding arms in their normal outer positions, and folding mechanism adapted to engage the gusset-folded portions at the upper end of said bag and fold the same after said gage wires and gusset-folding arms are moved upwardly above said bag.

5. In a bag packaging machine, a bag-supporting rail along which partially filled open bags are adapted to be moved, bag-closing mechanism disposed above a certain point along said bag-supporting rail, depending arms at each end of said bag-supporting rail, a vertical series of gear teeth on each of said arms, a shaft associated with each depending arm, supports for said shaft, a pinion on each of said shafts, sprocket wheels secured to said shafts, a sprocket chain passing around said sprocket wheels, and means to rotate one of said shafts and through the medium of said sprocket wheels and sprocket chain cause both depending arms of said bag-supporting rail to be raised or lowered to like degrees whereby said bag-supporting rail is brought closer to or moved more distantly from said bag-closing mechanism and thus bags of various heights be effectively closed by said bag-closing mechanism.

6. In a bag packaging machine, a bag-supporting rail along which partially filled open bags are intermittently moved from station to station, bag-closing mechanism disposed above one of said stations and adapted to close a bag when reaching such station, arms depending from opposite ends of said rail and having a vertical series of gear teeth thereon, a suitable support adjacent each of said depending arms, a housing guided by one of said supports, a shaft journaled in the other support, a second shaft journaled in said housing, a pinion secured to each of said shafts and in mesh with the gear teeth of its co-acting depending arm, a sprocket wheel on each of said shafts, a sprocket chain passing around each of said sprocket wheels, a ratchet wheel on the shaft journaled in said housing, a handle to rotate said last-mentioned shaft and thus through the medium of sprocket wheels and sprocket chains cause said pinions to actuate said depending arms and raise or lower said bag-supporting rail evenly throughout its length, and a lock dog for locking said ratchet wheel and preventing rotation of said shafts.

7. In a bag packaging machine adapted to fold and seal partially filled open bags formed of material sealable under heat, a bag support on which such a partially filled open bag is positioned, flap-folding mechanism and fold-gage mechanism disposed in a plane above the filled portion of said bag and relatively movable to collapse the upper end wall portions above the filled portion to said bag so as to bring opposite end walls in contact with each other, said flap-folding mechanism including a heater brought into contact with the confronting surface of said contacting walls and said fold gage mechanism having an element co-acting with said heater to grip said walls and to establish a fold line along which the bag is to be folded, and a fold bar adapted to swing in an arc of a circle while in contact with the portions of said contacting walls above said fold-gage element so as to turn down the upper free ends of said contacting walls to thereby heat the same and seal the bag after folding the same, and means on said fold-gage mechanism engaged by said flap-folding mechanism to cause said fold-gage element to be withdrawn from said fold prior to heating and sealing the same.

8. In a bag packaging machine adapted to fold and seal partially filled open bags formed of material sealable under heat, a bag support on which such a partially filled open bag is positioned, flap-folding mechanism and fold-gage mechanism disposed in a plane above said bag and relatively movable to collapse the upper end wall portions of the bag so as to bring opposite walls in contact with each other, said flap-folding mechanism including an electric heater brought into contact with the confronting surface of said contacting walls and said fold-gage mechanism having an element co-acting with said heater to grip said walls a predetermined distance below the free upper ends and to establish a fold line along which the bag is to be folded, a fold bar heated from said electric heater and adapted to swing in an arc of a circle while in contact with the portions of said contact walls above said fold-gage element so as to turn down the upper free ends of said contacting walls to thereby heat the same and seal the bags under opposite pressures exerted by said electric heater and said fold bar, and means on said fold-gage mechanism engaged by said flap-folding mechanism to cause said fold-gage element to be withdrawn from said fold prior to heating and sealing the same.

9. In a bag packaging machine, a bag support on which a partially filled open bag is positioned, gusset-folding mechanism disposed above the bag so positioned, flap-folding mechanism in a plane above the filled portion of said bag and to one side of the plane in which said gusset-folding mechanism is positioned, fold-gage mechanism in the plane in which said flap-folding mechanism is positioned, said flap-folding mechanism and said fold-gage mechanism being disposed at the opposite side of the plane in which said gusset-folding mechanism is positioned, said gusset-folding mechanism being adapted to gusset-fold opposite free upper wall portions of said bag inwardly and said flap-folding mechanism and fold-gage mechanism being adapted to force the remaining sides of said free upper wall portions inwardly toward each other and grip the same while folding said wall portions above the line at which they are gripped, said flap-folding mechanism including a primary frame movable toward said gripped

wall portions and a pivotal fold bar adapted to fold said wall portions upon themselves and serve in conjunction with a rigid portion of said primary frame to exert opposite pressures against the so folded wall portions, a spring-loaded secondary frame carried by said primary frame and adapted to prevent swinging movement of said fold bar during the movement of said primary frame against the gusset-folding wall portions of said bag, and means to overcome the resistance of said spring-loaded secondary frame and cause actuation of said fold bar after said primary frame is under co-action with said fold-gage mechanism to grip the gusset-folded walls of said bag.

10. In a bag packaging machine, a bag support on which an open partially-filled bag is positioned, gusset-folding mechanism disposed above said bag and operating to inwardly gusset-fold opposite free side walls at the upper end of said bag, swingable flap-folding mechanism to bear against the gusset-folded wall portions of said bag against counterpressure exerted from the opposite side of said wall portions, said flap-folding mechanism comprising a primary frame having a fixed shaft on which it is swingably mounted and an electric heating-element serving as a contact member to bear against the gusset-folded side walls of said bag, a cam member independently mounted on said fixed shaft, actuating mechanism for rocking said cam member and said primary frame in unison, a secondary frame member for said flap-folding mechanism having a shaft journaled in the lower end of said primary frame member, a fold-bar co-extensive with said heating-element, a pivot for said fold bar, a pinion having said pivot as its center, arms secured to said last-mentioned shaft and extending upwardly therefrom, a shaft journaled in the upper ends of said arms, a gear segment secured to said last-mentioned shaft and in mesh with said pinion to oscillate said fold-bar so as to cooperate with said heater, a roller extending from said gear segment and in engagement with said cam member to cause actuation of said primary frame, a torsion spring surrounding the shaft journaled in said arms and serving to restrain said secondary frame member from moving independently of said primary frame member after the latter bears against the gusset-folded wall portions of said bag, the force of said spring being overcome during the final swinging movement of said cam member through the action thereon of said roller causing said gear segment to oscillate and rotate said pinion and thereby swing said fold-bar through an arc of a circle to fold the free end portions of said gusset-folded wall portions against said heater.

11. In a bag packaging machine adapted to fold and seal partially filled open bags formed of material sealable under heat, comprising means to support a bag in vertical position, swingable flap-folding mechanism and fold-gage mechanism disposed at opposite sides of said plane, actuating means to swing said mechanism toward each other to cause the upper ends of opposite sides of the bag to be brought in contact with each other and certain regions of the walls of the bag to be passed downwardly against the contents of the bag to thereby provide upstanding free wall terminals, said fold-gage mechanism having a fold-gage element engaging the pressed together wall portions of the bag and said flap-folding mechanism having an electric heater serving as an abutment against which said last-mentioned wall portions are forced and a fold bar movable in an arc of a circle and arranged to carry the upper free terminals of said pressed together wall portions around said fold gage element, said fold-gage mechanism including means to cause withdrawal of said fold gage element from the fold so being formed to permit the fold-bar to press the folded bag portion against said electric heater, thereby causing the folded portion of the bag to be subjected to heat from said electric heater at one side of said folded portion and to heat of the fold-bar from said electric heater.

12. In a bag packaging machine adapted to fold partially filled open bags, means to press opposite side walls at the upper end of said bag inwardly in contact with each other, said means including an element at one side of the bag serving as an abutment and two spaced-apart fold gage elements swingable on different centers and movable toward said bag to force the opposite contacting side wall portions of the bag against said abutment at different elevations, means to fold the upper free terminals of said side walls downwardly over the upper of said fold gage elements and to cause the downwardly folded portion of the bag to be fashioned into angular form so as to provide an upstanding folded portion with a free lateral terminal, and means to cause downward movement of said upper fold gage element prior to completing the downward fold of said upper wall terminals so as to bring said fold gage elements into close proximity and permit withdrawal of the two elements from said bag.

13. In a bag packaging machine adapted to fold partially filled open bags, means to press opposite side walls at the upper end of said bag inwardly in contact with each other, said means including an element at one side of the bag serving as an abutment and two spaced-apart fold gage elements swingable on different centers and movable together toward said bag to press the opposite contacting side wall portions of the bag against said abutment at different elevations, means to fold the upper free terminals of said side walls downwardly over the upper of said fold gage elements and to cause the downwardly folded portion to be fashioned into angular form so as to provide an upstanding folded portion with a free lateral terminal, means to cause downward movement of said upper fold gage element prior to completing the downward fold of said upper wall terminals so as to bring said fold gage elements into close proximity and permit withdrawal of the two elements from said bag, and supplemental folding mechanism causing the upstanding folded portion of the bag to be folded downwardly against the lateral free wall terminals and thus form a flat fold for said bag.

14. In a bag packaging machine adapted to close partially filled open bags by folding the upper free wall portions of the bag, including fold-gage mechanism and flap-folding mechanism cooperating with said fold gage mechanism and serving as an abutment for the latter while in operation to fold said free wall portions, said fold-gage mechanism comprising a swingable frame having a rock shaft journaled in its lower end, rock levers at opposite ends of said rock shaft and extending in opposite directions therefrom to form opposite arms, a rock shaft journaled in the ends of corresponding arms of said levers and disposed between said first-mentioned rock shaft and the bag to be folded, a gage member rockable on said first-mentioned rock shaft having spaced-apart arms extending toward said

bag and a slender gage element connecting the outer ends of said arms and a gage member carried by said second mentioned rock shaft and having spaced-apart arms extending therefrom and a slender gage element connecting the outer ends of said arms, said gage elements being normally disposed at different levels and adapted to be swung inwardly against the free end wall portions of said bag so as to press opposite free end wall portions of the bag together, said flap-folding mechanism including means for folding said pressed together free end wall portions over the upper of said slender gage elements, and means to move said last-mentioned gage element downwardly into proximity to the other gage element so as to free said gage elements from said folded package portion and permit withdrawal of said fold gage mechanism from said bag.

15. In a bag packaging machine adapted to close a bag by folding and sealing the upper free end wall portions of partially filled bags, means for gripping opposite side walls of said bag above the contents therein so as to press the upper free portions of said side walls downwardly into contact with the contents of the bag and to force said side walls above said downwardly-pressed portions thereof together to form an upwardly extending flap, said means including flap-folding mechanism movable toward and from said bag at one side thereof including means to fold and heat said upstanding flap and fold-gage mechanism at the opposite of said bag to urge said flap

against said folding mechanism while establishing a straight-lined contact at which said flap is to be folded, said fold-gage mechanism including a pair of spaced-apart arms pivotally secured at their upper ends and having a rock shaft journaled in their lower ends connecting said arms, rock levers mounted on said rock shaft and having arms extending respectively inwardly toward said bag and outwardly away from the same, a rock shaft connecting the inwardly-extending arms, a gage member mounted on each of said rock shafts, said gage members including normally spaced-apart gage wires at their inner ends adapted to engage the free walls at the confronting side of said bag, and means to change the relative positions of said gage elements, said rock levers and said last-mentioned means being spring controlled.

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