

Nov. 23, 1937.

D. E. KEECH

2,100,282

TUCKING MECHANISM

Filed Feb. 12, 1934

4 Sheets-Sheet 1

FIG. 1

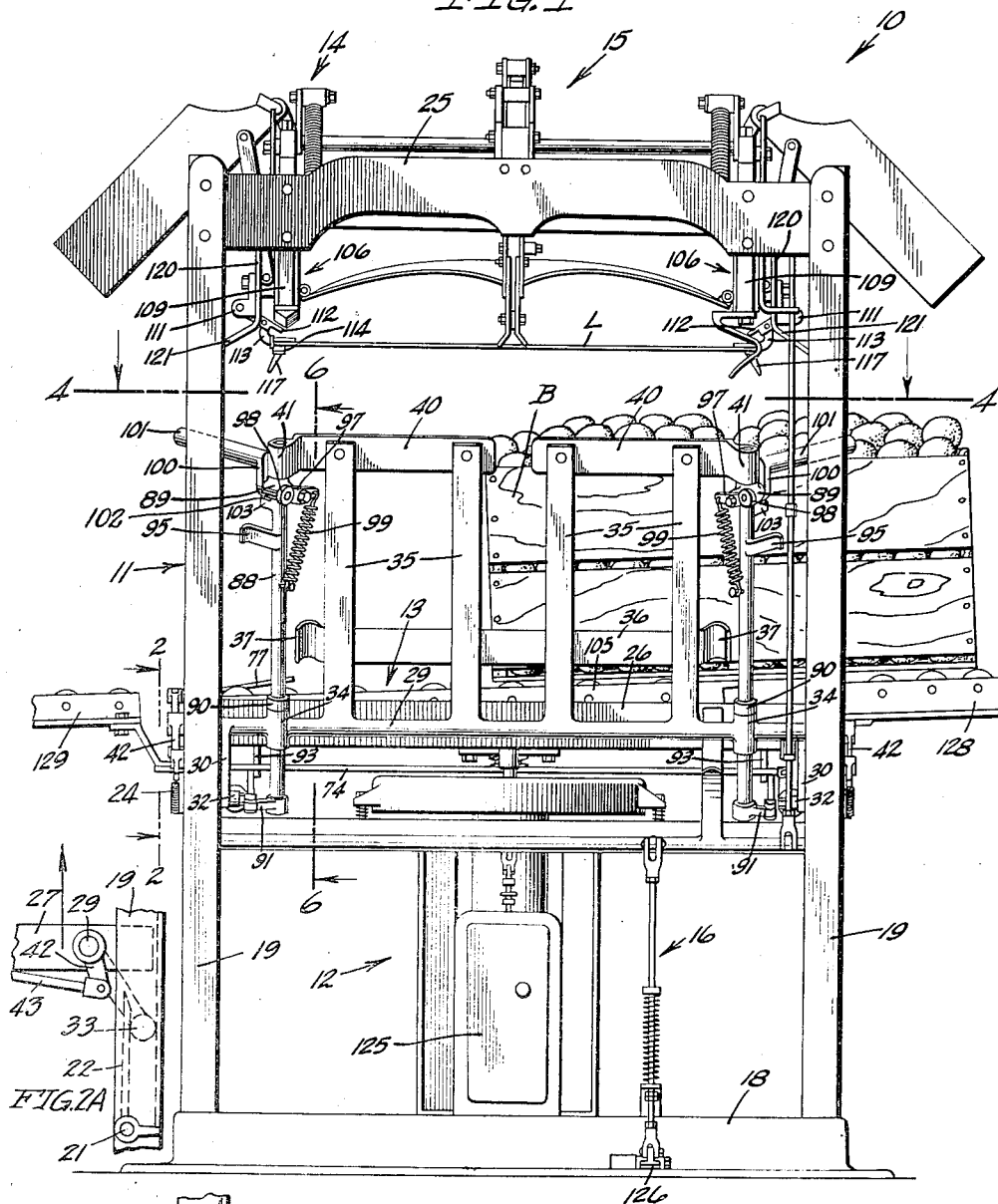


FIG. 2A

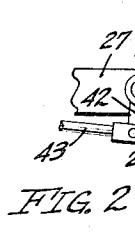
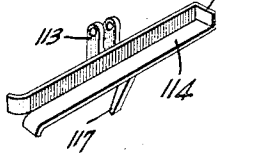


FIG. 3



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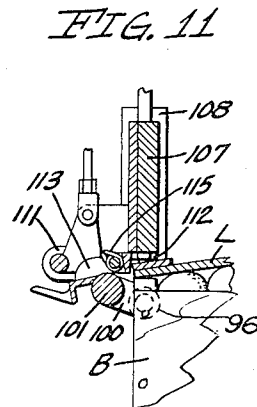
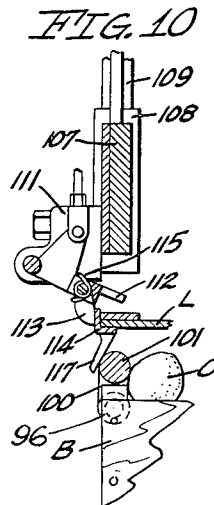
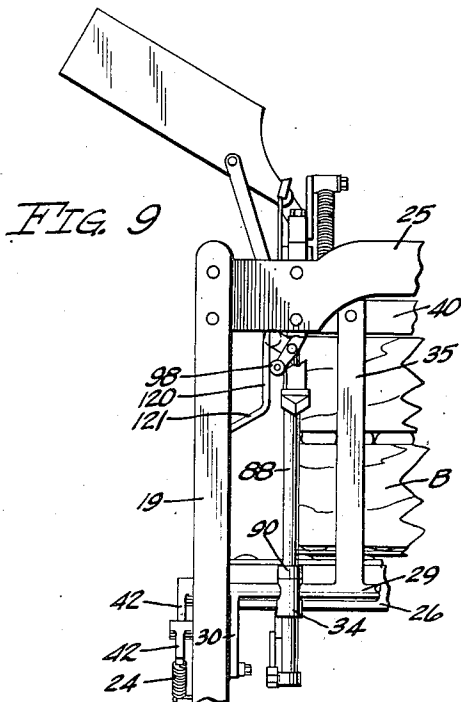
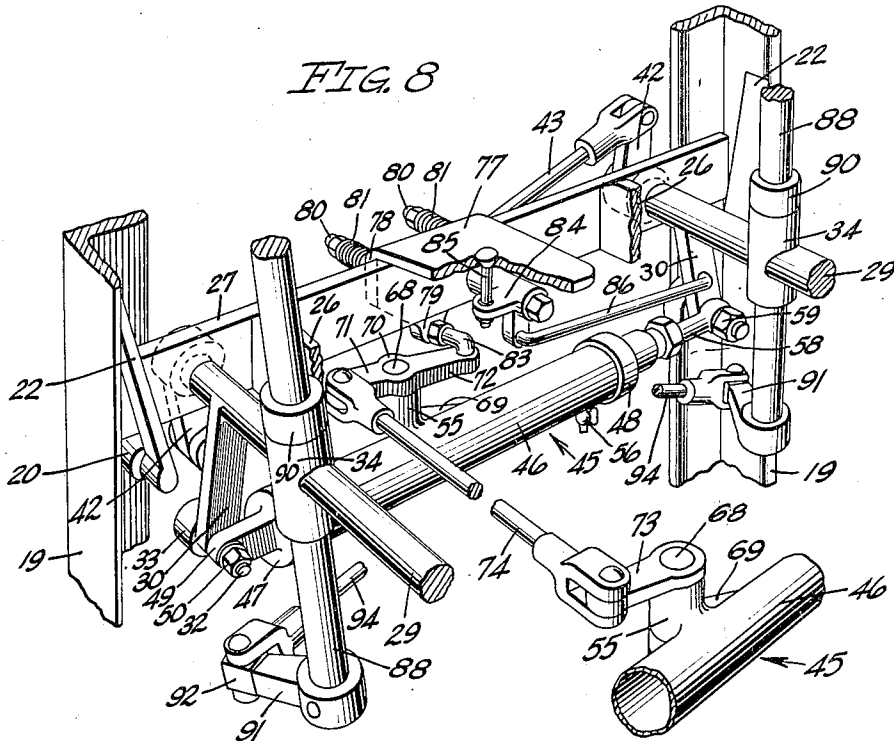
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TUCKING MECHANISM

Filed Feb. 12, 1934

4 Sheets-Sheet 3



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2,100,282

TUCKING MECHANISM

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mesne assignments, to Food Machinery Cor-
poration, a corporation of Delaware

Application February 12, 1934, Serial No. 710,845

22 Claims. (Cl. 1—10)

My invention relates to the art of lidding over-
filled boxes and the like and is particularly use-
ful in the fruit and vegetable packing industries.

It is a principal object of my invention to pro-
vide improved means for tucking in or gathering
in that portion of the contents of an overfilled
box which tends to overflow the sides and ends of
the box as the lid is being pressed onto the box.

The manner of accomplishing the foregoing
object as well as further objects and advantages
will be made manifest in the following descrip-
tion taken in connection with the accompanying
drawings, in which:

Fig. 1 is a front elevational view of a box lid-
ding machine comprising a preferred embodiment
of my invention.

Fig. 2 is a fragmentary elevational view taken
in the direction of the arrow 2 of Fig. 1.

Fig. 2A is a view similar to Fig. 2 and showing
the nailing table partly lifted.

Fig. 3 is a detail perspective view of one of the
parts included in the machine shown in Fig. 1.

Fig. 4 is a horizontal sectional view taken on
the line 4—4 of Fig. 1.

Fig. 5 is a fragmentary view similar to a por-
tion of Fig. 4 showing the operative position of
certain parts disclosed therein.

Fig. 5A is an enlarged sectional detail view
taken on the line 5A—5A of Fig. 5.

Fig. 6 is a vertical sectional view taken on the
line 6—6 of Fig. 1.

Fig. 7 is an enlarged, horizontal, sectional view
taken on the line 7—7 of Fig. 6.

Fig. 8 is a fragmentary detail perspective view
of a portion of the mechanism included in the
machine of my invention.

Fig. 9 is a fragmentary elevational view of a
portion of the machine shown in Fig. 1 illustrat-
ing the operation of certain parts thereof.

Figs. 10 and 11 are fragmentary semi-diagram-
matical views showing the operation of certain
parts of my invention.

Fig. 12 is a fragmentary front elevational view
of a modified form of lidding machine of my in-
vention.

Fig. 13 is a fragmentary enlarged vertical sec-
tional view taken on the line 13—13 of Fig. 12.

Figs. 14 and 15 are sectional views similar to
Fig. 13 showing successive operative positions of
the mechanism disclosed therein.

Referring specifically to the drawings, a box
lidding machine 10 comprising a preferred em-
bodiment of my invention is shown in Fig. 1, this
machine including a frame 11, a power unit 12, a
nailing table 13, a nailing mechanism 14, a strap-
per 15, and a control mechanism 16.

With the exception of the nailing table 13, the
machine 10 disclosed herein is substantially
identical to the lidding machine shown and de-
scribed in the copending application of Hale Pax-

ton, Gerald C. Paxton, and Harry D. Benson for
Automatic lid nailing and strapping machine,
Serial No. 688,104, filed September 5, 1933. The
frame 11, power unit 12, nailing mechanism 14,
strapper 15, and control mechanism 16 will be de-
scribed but briefly herein, a more detailed de-
scription thereof being set forth in the above re-
ferred to copending application.

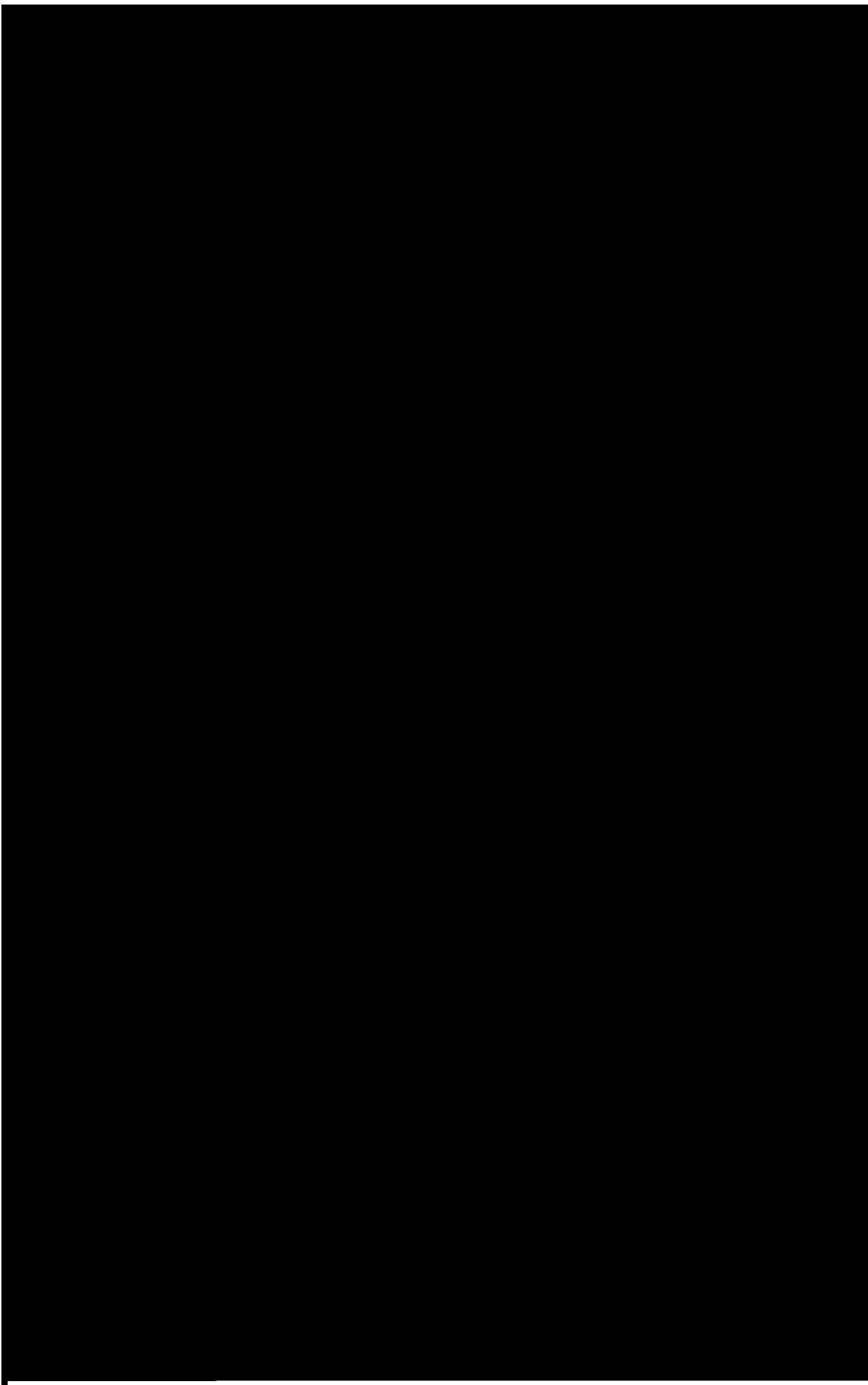
The frame 11 includes a rectangular angle iron
base portion 18 to which the lower ends of four
vertical posts 19 are secured. Provided on each
of the posts 19 is a bearing 20 (Figs. 2 and 8) in
which the trunnion 21 of a cam plate 22 is jour-
nalled. Fixed on the trunnion 21 outside of the
posts 19, as shown in Fig. 2, are levers 23 having
springs 24 attached thereto, the latter urging the
cam plates into the position shown in Fig. 2.
Connected to the upper ends of the posts 19 are
front and rear horizontal plates 25, one of the
latter being shown in Fig. 1.

The power unit 12 is also clearly shown in the
aforesaid application and includes an electric
motor and suitable mechanism for raising and
lowering the nailing table 13 under the power of
said motor.

The nailing table 13 includes front and rear
longitudinal frame members 26 and transverse
members 27 and 28 as shown in Fig. 4, the mem-
bers 26 being fixed to the upper end of the power
unit 12. Journalled at opposite ends thereof in
the transverse members 27 and 28 are front and
rear shafts 29 as shown in Figs. 1, 6, and 8. At
opposite ends of the shafts 29 are depending arms
30, the latter being positioned just inside of the
transverse members 27 and 28 of the table 13 as
shown in Fig. 1. Rotatably mounted on suitable
pins 32 at the lower ends of each of the arms 30
are rollers 33, the latter being positioned so as
to contact the cam plates 22 in a manner to be
described hereinafter.

Formed on each of the shafts 29 adjacent the
arms 30 are bearings 34 and extending upward
from each of the shafts 29 between the bearings
34 are four vertical bars 35. Fixed on the bars
35 above the shafts 29 are horizontal bars 36
having arcuate portions 37 at opposite ends
thereof. Bolted to the upper ends of the bars 35
are horizontal flusher plates 40, the outer ends
of which are provided with bearings 41 which are
axially aligned with the bearings 34 of shafts
29. Fixed on the extreme outer ends of the
shafts 29, outside of the transverse members 27,
are arms 42. The arms 42 of the front shaft 29
extend downwardly while the arms 42 of the
rear shaft extend upward as shown in Fig. 8.
Joining the ends of the arms 42 at each end of
the nailing table 13 are diagonal cross-links 43
by means of which the rotational movements of
the shafts 29 are equalized.

Suspended between the lower ends of the arms



bell crank 84, and pulls the stop 77 downward below the bottom of the box B so that the springs 81 urge the stop 77 to extend under the box B as shown and described in the above referred to application. As the stop 77 is thus shifted to the right the pawls 69 of the units 45 are returned to the positions in which they are shown in Fig. 7.

When the shafts 29 rotate, the vertical shafts 88 swing from the positions in which they are shown in Fig. 4 to that shown in Fig. 5. As the shafts 88 are thus moved the links 94 retain the ends of the arms 91 against outward movement, thus rotating the vertical shafts 88 and causing the end flusher bars 101 to be swung over the ends of the box B, as shown in Figs. 5 and 10, so as to move the pack O of the box B inward from over the ends of the box.

While the end flushers 101 are operating, the side flusher plates 40 move inward so as to tuck the pack O inward from over the upper edges of the sides of the box B. It is thus clear that a complete overflow gathering function at the sides and ends of the box B is accomplished in response to movement of the stop 77 by the box B. As the vertical shafts 88 swing inward toward the box B the rotation of these shafts brings the fingers 95 into contact with the ends of the box B and centers the latter longitudinally on the table 13, the bar 36 and its arcuate ends 37 centering the box in transverse relation with the table 13.

As also clearly shown and described in the aforesaid copending application, the high end of the sloping conveyor section 105 of the nailing table 13 is lowered by inward swinging of the side flushers so that this conveyor section is now level.

After the flushers are moved in as shown in Fig. 5, the operator of the machine 10 depresses the foot pedal 126 causing the power unit 12 to elevate the nailing table 13. As the table 13 rises, the rollers 33 on the ends of the arms 30 (Fig. 2A) of the shafts 29 pass upward between the posts 19 of the frame 11 and the cams 22, the latter pivoting about their trunnions 21 to permit this. When the rollers 33 are carried above the cams 22 the latter are returned by the springs 24 to their normal positions as shown in Fig. 2.

As the box B moves upward toward the nailing units 106 the end flusher bars 101 contact the fingers 117 of the lid end supporting bars 114 as shown in Fig. 10 and cause the bars 114 to be swung outward from under the lid L allowing the ends of the lid to be held firmly between the flusher bars 101 and the lid end pressing members 112. At this time the rollers 98 on the levers 97 of the end flushers 101 contact the cam bars 120 as shown in Fig. 9 causing the end flusher bars 101 to be swung from under the ends of the lid L as shown in Fig. 11.

During the balance of the upward movement of the box B the lid L is nailed and strapped to the box, whereupon the operator releases the pedal 126 allowing the nailing table to start down. As the table moves down, the rollers 33 contact the cam plates 22 on the posts 19 of the frame 11 and the shafts 29 are rotated back to their normal position, the springs 66 of the units 45 being compressed and held in the position shown in Fig. 7 by the pawls 69 in readiness for the next lidding operation. After the box B is lidded it is discharged from the machine 10 onto a suitable discharge conveyor 129.

Referring particularly to Figs. 12 to 15 inclusive, I have shown therein a lidding machine 130

which includes a modified form of side tuckers 131. The machine 130 is substantially identical with the aforescribed machine 10 with the exception of the side tuckers 131 and the fact that the machine 130 is designed particularly to lid paper lined vegetable crates. It will be noted that similar parts of the machines 10 and 130 are indicated by the same reference numerals. The side tuckers 131 of the machine 130 include horizontal shafts 135, the latter being mounted and actuated in the same manner as the shafts 29 of the machine 10. Extending upward from the shafts 135 are arms 35, to the upper ends of which horizontal bars 136 are fixed. Also fixed to the arms 35 just below the bars 136 are bars 137, the ends of the latter being bent inward to provide crate positioning fingers 138. Fixed to the bars 136 and 137 are pairs of vertically aligned bearings 140 in which rods 141 are slidably received. Mounted on the upper ends of the rods 141 by means of lugs 142 are side tucker plates 143.

The plates 143 are urged upward to the position shown in Figs. 12, 13, and 14 by compression springs 145, the upper ends of the latter bearing against pins 146 in the rods 141. The pins 146 also limit the upward movement of the rods 141 by contact with the upper bearings 140. When a crate, such as a lettuce crate C, is delivered onto the nailing table 13 of the machine 130, contact of the crate with the stop 77 causes the side tuckers 131 to be swung from the position shown in Fig. 13 to that shown in Fig. 14, it being noted that the plates 143 (only one of these being shown) are positioned inward from over the crate sides so as to move the pack O and paper liner P thereof inward.

After the side tuckers 131 are actuated the crate is raised in the same manner as described relative to the machine 10 and the tucker plates 143 are forced downward between the pack O and the sides of the crate C as shown in Fig. 15 by suitable stationary fingers 147 provided on the machine 130. This causes any surplus portion of the liner P at the sides of the crate C to be neatly tucked behind the crate sides while a lid L is being pressed and nailed to the crate C.

To avoid unnecessary duplication, I have not shown end tuckers on the machine 130, it being understood that the end tuckers 101 shown on the machine 10 might be used on the machine 130.

Although I have shown and described but one preferred and one modified form of my invention, it is to be understood that various changes and modifications might be made in these without departing from the spirit of the invention or the scope of the appended claims. In particular I would note that while the shafts 29 and 135 are shown as spring operated to fold in the tuckers, these shafts might, where considerable resistance confronts the tuckers, be cam actuated as in the aforementioned copending application.

What I claim is:

1. In a machine for pressing covers on over-filled boxes the combination of: cover pressing mechanism; a stop for stopping a box in place in said machine; means for moving overflow portions of the contents of said box inward; and means for actuating said overflow moving means in response to said stop being engaged by a box.

2. In a machine for pressing covers on over-filled boxes the combination of: cover pressing mechanism; a stop for stopping a box in place in said machine; means for moving overflow por-

tions of the contents of said box inward; means for actuating said overflow moving means in response to said stop being engaged by a box; and means to move said overflow moving means to inactive position on said cover pressing mechanism completing its cycle of operation.

3. In a machine for pressing covers on overflowed boxes the combination of: cover pressing mechanism; a stop for stopping a box in place in said machine; means for moving overflow portions of the contents of said box over the sides thereof inward; and means for actuating said overflow moving means in response to said stop being engaged by a box.

4. In a machine for pressing covers on overflowed boxes the combination of: cover pressing mechanism; a stop for stopping a box in place in said machine; tucker means for moving overflow portions of the contents of said box over the ends thereof inward; and means for actuating said overflow moving means in response to said stop being engaged by a box.

5. In a machine for pressing covers on overflowed boxes the combination of: cover pressing mechanism; a stop for stopping a box in place in said machine; means for moving overflow portions of the contents of said box over the sides and ends thereof inward; and means for actuating said overflow moving means in response to said stop being engaged by a box.

6. In a machine for pressing covers on overflowed boxes, the combination of: cover pressing mechanism; gathering means mounted on said machine for movement inward toward a side of a box in said machine to move overflow inward from over said side; a second gathering means mounted with said first gathering means so that said two gathering means move as a unit, said second gathering means being adapted to gather overflow inwardly from over an end of said box when in inward position; and means to coordinately move said two gathering means to cause these to perform their respective gathering functions.

7. In a machine for pressing covers on overflowed boxes, the combination of: cover pressing mechanism, gathering means movably mounted on said machine for movement inward toward a side of a box in said machine to move overflow inwardly from over said side; a second gathering means pivotally mounted on one end of said first gathering means for movement inwardly therewith; said second gathering means being adapted to gather overflow inwardly from over an end of said box when in inward position and when rotated about the axis of its mounting; and means for coordinately moving said two gathering means inwardly and rotating said second gathering means as aforesaid to cause said two gathering means to perform their respective gathering functions.

8. In a machine for pressing covers on overflow boxes, the combination of: cover pressing mechanism; a pair of side gathering means mounted on said machine for movement inwardly from laterally retracted positions toward opposite sides of a box in said machine to move overflow inwardly from over said sides; a pair of end gathering means one of which is mounted with each of said side gathering means so that each such end and side gathering means move inwardly as a unit, said pair of end gathering means being adapted to cooperatively gather overflow inwardly from over an end of said box when in inward positions; and means to coordinately move said two pairs of gathering means

inwardly to cause these to perform their respective gathering functions as aforesaid.

9. In a machine for pressing covers on overflowed boxes, the combination of: cover pressing mechanism; a pair of gathering members pivotally mounted on different axes to swing in towards each other and against the overflow along a single given straight edge of the top of a box in said machine, said edge constituting the upper boundary of one face only of said box; and means for coordinately actuating said gathering members to gather in the overflow along said edge.

10. A combination as in claim 9 in which said edge is at an end of said box; and means for moving said members out from over said box end just before the consummation of the cover pressing operation.

11. In a machine for pressing covers on overflowed boxes the combination of: a crate supporting table; an overhead structure having cover end engaging surfaces; means causing relative vertical movement between said table and said structure to press the ends of a cover onto ends of a crate resting on said table; a side tucker; means provided on said table and supporting said side tucker adjacent the overflow along one side of a crate resting on said table, said tucker supporting means being adapted to be actuated to shift said tucker inwardly against said overflow and to permit relative vertical movement between said tucker and said table; means for actuating said tucker supporting means for shifting said tucker inward to tuck said overflow over the interior of said crate; and means for thereafter causing said tucker to extend vertically into said crate just inside an adjacent upper side slat thereof.

12. In a machine for pressing covers on overflowed boxes the combination of: a crate supporting table; an overhead structure; means causing relative vertical movement between said table and said overhead structure to press the ends of the cover onto ends of the crate; tucker supporting arms pivotally mounted on said table; a side tucker; yieldable means on the upper ends of said arms for supporting said tucker with the latter disposed horizontally opposite the overflow along one side of a crate resting on said table, said yieldable means permitting relative vertical movement between said tucker and said table; means for swinging said arms inward to cause said tucker to engage said overflow and to shift the tucker and the overflow inwardly over the interior of said crate; and means on said overhead structure for engaging said tucker incidental to said cover pressing operation to cause relative vertical movement between said table and said tucker to extend the latter into the interior of said crate just within an adjacent upper side slat thereof.

13. In a machine for pressing covers on overflowed boxes the combination of: a crate supporting table; an overhead structure having cover end engaging surfaces; means causing relative vertical movement between said table and said structure to press the ends of a cover onto ends of a crate resting on said table; a side tucker; means provided on said table and supporting said side tucker adjacent the overflow along one side of a crate resting on said table, said tucker supporting means being adapted to be actuated to shift said tucker inwardly against said overflow and to permit relative vertical movement between said tucker and said table; means for automatically actuating said tucker supporting means for shifting said tucker inward to tuck

said overflow over the interior of said crate before said lid is pressed onto the contents of said crate with a substantial pressure; and means for thereafter actuating said tucker supporting means in timed relation with said lid end pressing operation to cause said tucker to extend vertically into said crate just inside an adjacent upper side slat thereof.

14. In a machine for pressing covers on over-filled boxes the combination of: a crate supporting table; an overhead structure having cover end engaging surfaces; means for elevating said table towards said overhead structure to press the ends of a cover onto ends of a crate resting on said table; a side tucker; means provided on said table and supporting said side tucker adjacent the overflow along one side of a crate resting on said table, said tucker supporting means being adapted to be actuated to shift said tucker inwardly against said overflow and to permit relative vertical movement between said tucker and said table; means for actuating said tucker supporting means for shifting said tucker inward to tuck said overflow over the interior of said crate; and means on said overhead structure for thereafter actuating said tucker supporting means to cause relative vertical movement between said table and said tucker to extend the latter vertically into said crate just inside an adjacent upper side slat thereof.

15. In a cover press the combination of: means for pressing opposite ends of a cover onto opposite ends of an overfilled box; an end gathering member for pressing overflow product inward from over an end of said box to prevent said overflow being pinched in said cover pressing operation; means for mounting said gathering member on a substantially vertical axis to swing about said axis between gathering and non-gathering positions; and means on said last aforementioned means to permit said gathering member to shift from gathering position to a non-gathering position without substantial rotation of said gathering member about said vertical axis.

16. In a machine for pressing covers onto over-filled boxes, the combination of: a table; an overhead structure having cover end engaging means; means causing relative vertical movement between said table and said structure to press the ends of a cover onto ends of a crate resting on said table; end gathering member supporting means on said table; and an end gathering member mounted on said supporting means to swing relative to said supporting means about a substantially vertical axis between gathering and non-gathering positions; and means for moving said end gathering member supporting means towards a crate resting on said table and, coordinately with said movement, swinging said gathering member into gathering position.

17. In a machine for pressing covers onto over-filled boxes, the combination of: a table; an overhead structure having cover end engaging means; means causing relative vertical movement between said table and said structure to press the ends of a cover onto ends of a crate resting on said table; a pair of end gathering members for gathering overflow inwardly from over the ends of said crate; means for mounting said end gathering members on said table; means extending under and supporting ends of a cover over ends of said crate during said cover pressing operation, said end gathering members engaging and

dislodging said cover supporting means from between said box and said cover towards the conclusion of said cover pressing operation.

18. In a machine for pressing covers onto over-filled boxes, the combination of: a table; an overhead structure having cover end engaging means; means causing relative vertical movement between said table and said structure to press the ends of a cover onto ends of a crate resting on said table; a pair of end gathering members for gathering overflow inwardly from over the ends of said crate; means for mounting said end gathering members on said table; means for shifting said end gathering members into operative positions to move overflow inwardly from over the ends of said crate; and means, associated in the aforesaid relative movement with said overhead structure, for shifting said end gathering members out from between said box ends and the ends of said cover during a concluding portion of the relative movement of said table and structure to press said cover on said crate.

19. In a machine for pressing covers onto over-filled boxes, the combination of: a table; an overhead structure having cover end engaging means; means causing relative vertical movement between said table and said structure to press the ends of a cover onto ends of a crate resting on said table; means for moving overflow inwardly from over the upper edges of said crate; and crate responsive means for automatically operating said last mentioned means to move said overflow as aforesaid in timed relation to the delivery of said crate to said table and prior to the operation of said relative movement means.

20. A combination as in claim 19 in which said automatic moving means includes power storage means in which power is stored by said relative movement means during one cover pressing cycle, said power being expended in the operation of said overflow moving means incidental to a subsequent cover pressing cycle.

21. In a machine for pressing covers on overflow boxes, the combination of: cover pressing mechanism; side gathering means normally spaced laterally from a side of said box and adapted when moved inwardly toward said side to move overflow inwardly from over said side; and end gathering means normally spaced laterally away from the aforesaid side of said box and adapted when shifted inwardly toward said side adjacent one of the ends of said box to gather overflow inwardly from over said end; and means for coordinately shifting said gathering means from their laterally spaced positions inwardly to cause them to perform their respective gathering functions as aforesaid.

22. In a machine for pressing covers on overflow boxes, the combination of: cover pressing mechanism; side gathering means normally spaced laterally from a side of said box and adapted when moved inwardly toward said side to move overflow inwardly from over said side; and end gathering means normally spaced laterally away from the aforesaid side of said box and adapted when shifted inwardly toward said side adjacent one of the ends of said box to gather overflow inwardly from over said end; and means for simultaneously shifting said gathering means from their laterally spaced positions inwardly to cause them to perform their respective gathering functions as aforesaid.

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