Sept. 17, 1940. J. W. DE MARS 2,215,094

LETTUCE PACKING MACHINE

Original Filed March 15, 1932 4 Sheets-Sheet 1

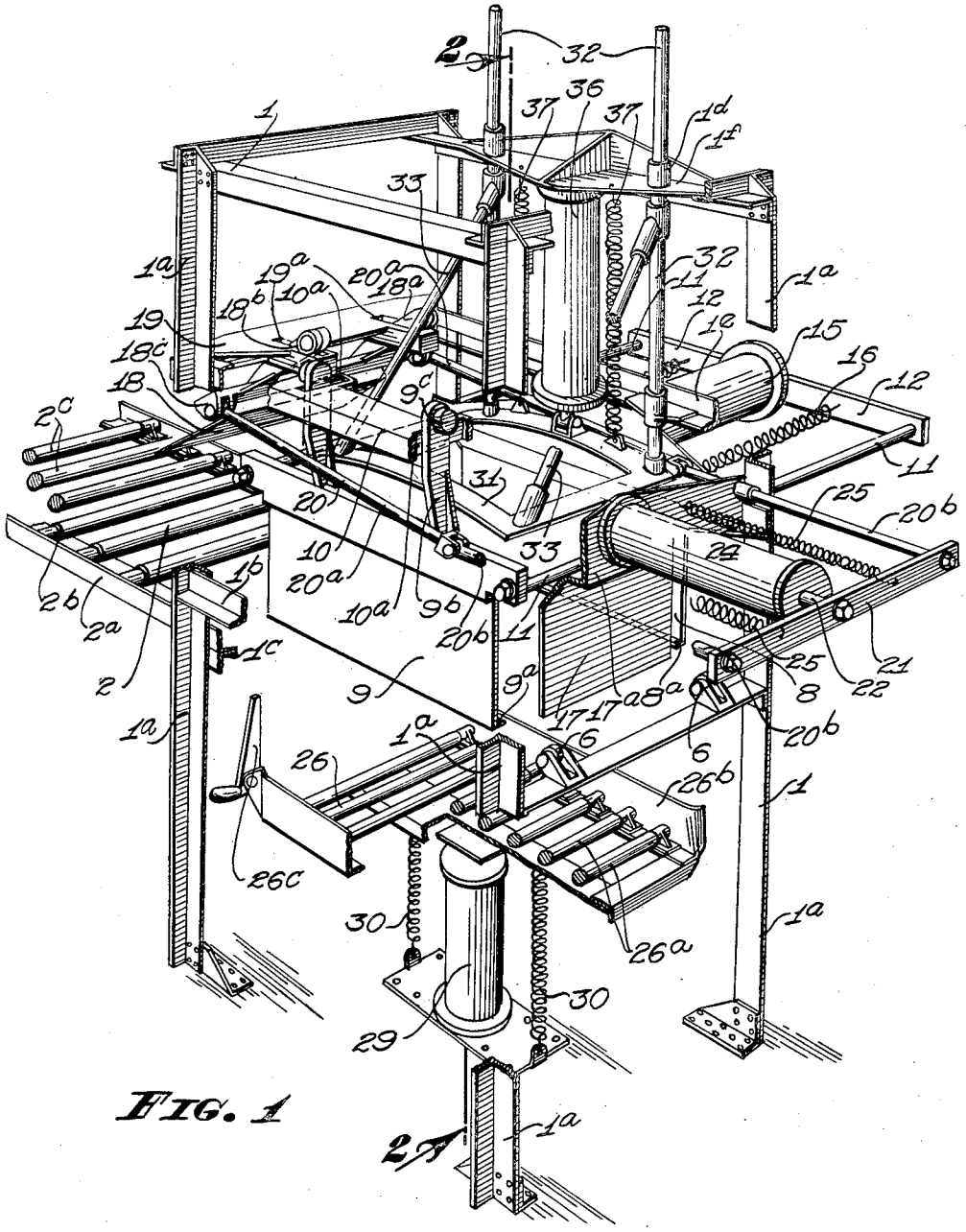


FIG. 1

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LETTUCE PACKING MACHINE

Original Filed March 15, 1932 4 Sheets-Sheet 2

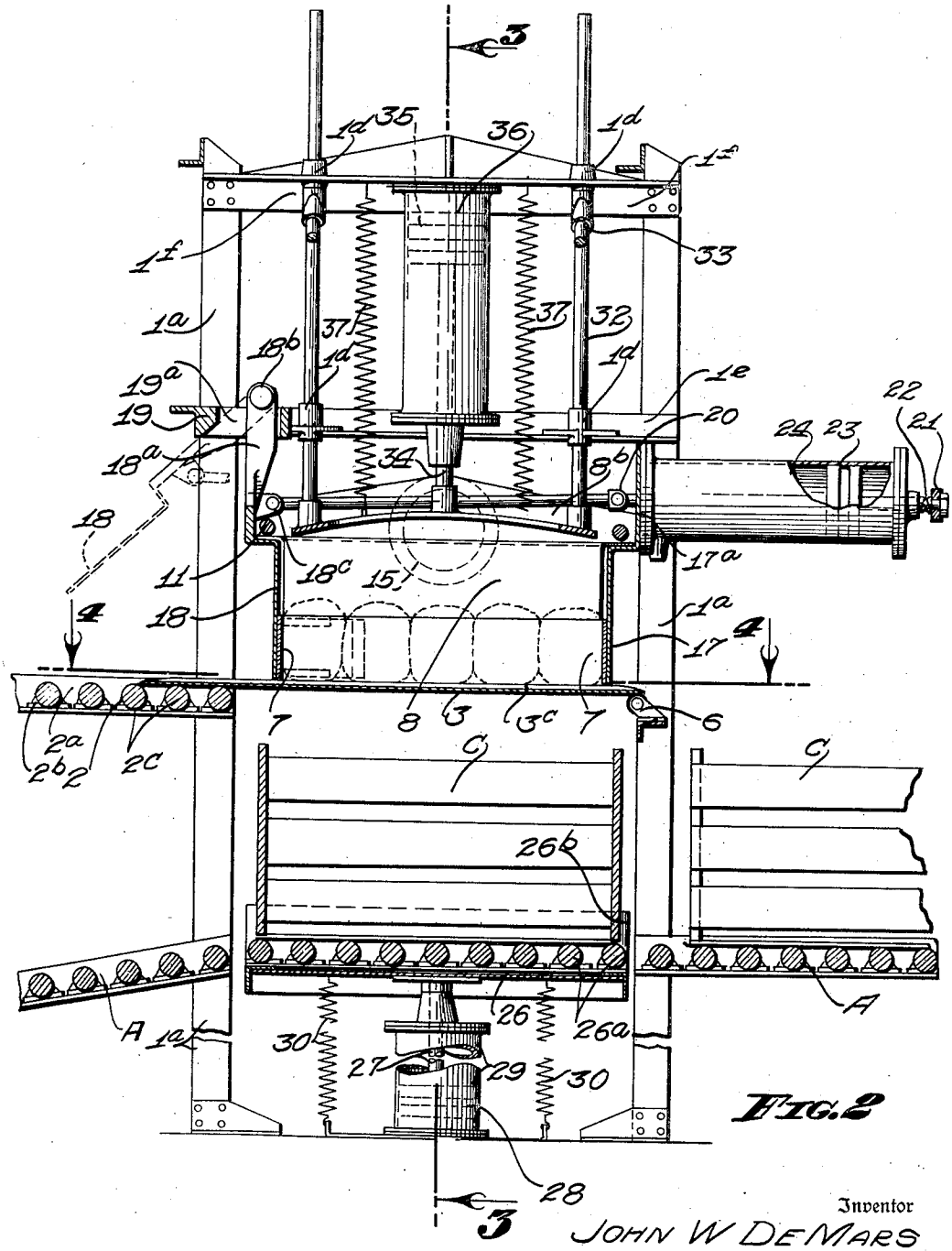


FIG. 2

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LETTUCE PACKING MACHINE

Original Filed March 15, 1932 4 Sheets-Sheet 3

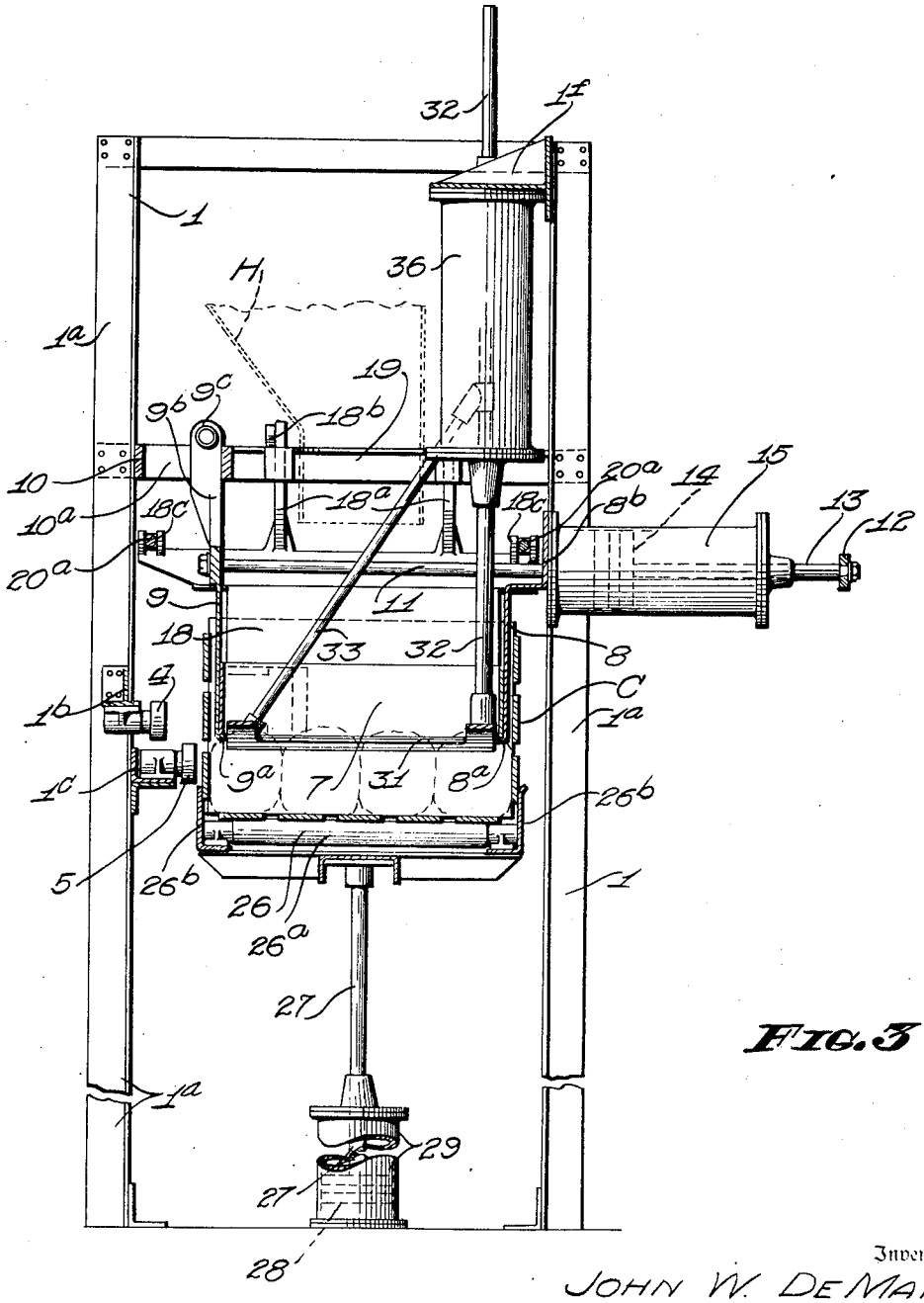


FIG. 3

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LETTUCE PACKING MACHINE

Original Filed March 15, 1932 4 Sheets-Sheet 4

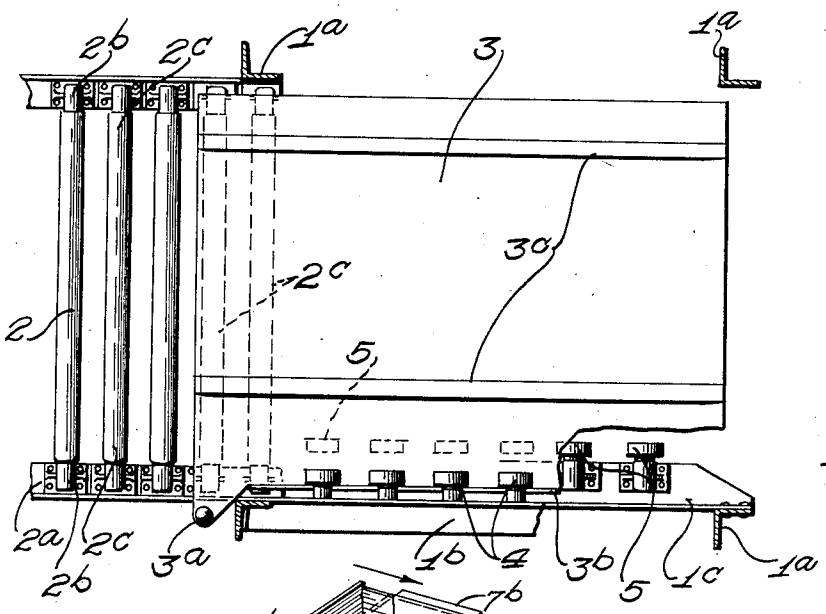


FIG. 4

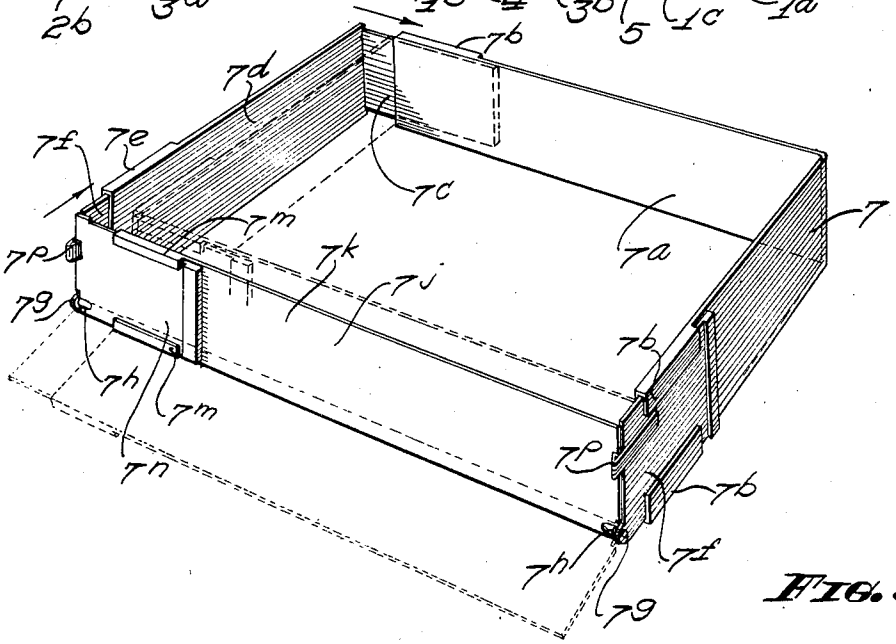


FIG. 5

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UNITED STATES PATENT OFFICE

2,215,094

LETTUCE PACKING MACHINE

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Refiled for abandoned application Serial No. 598,980, March 15, 1932. This application September 3, 1938, Serial No. 228,456

13 Claims. (Cl. 226—14)

This application is refiled for abandoned application Serial No. 598,980, filed March 15, 1932.

My invention relates to lettuce packing machines, and the objects of my invention are:

First, to provide a machine of this class which quickly compresses a layer of lettuce to a predetermined size and inserts the layer into a crate;

Second, to provide a machine of this class which reduces to a minimum injury or wastage of the lettuce;

Third, to provide a machine of this class which compresses each layer of lettuce as it is positioned so that the uppermost layer of lettuce is not excessively compressed during or by reason of the lidding operation;

Fourth, to provide a machine of this class which incorporates a novelly constructed lettuce receiving frame which allows the lettuce to be initially packed therein in a relatively loose condition;

Fifth, to provide a machine of this class in which the lettuce receiving frame includes a gate member along one of its sides whereby the lettuce may be packed therein from the side as well as from the top; thus enabling the lettuce receiving frame to be filled in a minimum amount of time;

Sixth, to provide a machine of this class which is so arranged that crushed ice or other refrigerant may be placed between and around the layers of lettuce, and

Seventh, to provide on the whole a novelly constructed lettuce packing machine which is particularly durable and sturdy of construction, being capable of withstanding rough usage without deteriorating or getting out of order.

With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application, in which:

Figure 1 is a perspective view of my lettuce packing machine with parts and portions broken away or removed to facilitate the illustration; Fig. 2 is a sectional view thereof substantially through 2—2 of Fig. 1, with the lettuce packing frame shown in position and with the side and end engaging members holding said frame in its contracted condition; Fig. 3 is a sectional view through 3—3 of Fig. 2 with the packing frame supporting plates removed and the crate and ejector in the positions assumed after a layer of lettuce has been ejected from the packing frame; Fig. 4 is a sectional view through 4—4 of Fig. 2; Fig. 5 is a perspective view of the lettuce packing frame.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings.

Framework 1, shelf 2, tray 3, upper marginal rollers 4, lower marginal rollers 5, tray end supporting means 6, lettuce packing frame or box 7, fixed side plate 8, movable side plate 9, supporting bracket 10, operating rods 11, cross head 12, piston rod 13, piston 14, cylinder 15, release springs 16, fixed end plate 17, movable end plate 18, supporting bracket 19, connecting means 20, cross head 21, piston rod 22, piston 23, cylinder 24, release springs 25, crate supporting frame 26, piston rod 27, piston 28, cylinder 29, return springs 30, ejector member 31, guide posts 32, braces 33, piston rod 34, piston 35, cylinder 36, and return springs 37, constitute the principal parts and portions of my lettuce packing machine.

A framework 1 is provided which includes four uprights 1*a* arranged in the corners of the machine and various cross members for supporting the various elements thereof. Extending laterally outwardly from a pair of uprights 1*a* is a shelf 2 including side members 2*a* upon which are mounted suitable bearings 2*b* adapted to support rollers 2*c*.

The shelf 2 is adapted to slidably support a tray 3. The tray 3 is adapted to pass between the uprights arrayed at the end of the shelf 2 and into the rectangular space delineated by the four uprights of the machine. The tray may be somewhat longer than this area so that one end thereof remains upon the shelf 2 which end may be provided with a suitable handle 3*a* for the purpose of shifting the tray. In order to keep the space within the framework 1 as unimpeded as possible, the tray 3 when extended into the framework is supported from one margin only thereof. This margin is provided with an upturned edge 3*b*. Upper marginal rollers 4 which are supported from a cross member 1*b* of the framework engage the tray at its upper side adjacent the upturned edge 3*b*. Lower marginal rollers 5 supported from another cross member 1*c* of the framework 1 engage the under side of the tray a short distance inwardly from the rollers 4. When the tray is in its position within the framework its extended end may be supported by rollers or other suitable means 6.

The tray 3 is adapted to receive a lettuce packing frame or box 7, which is illustrated in Fig. 5. The box 7 is extensible and contractible. To this end, there is provided an L-shaped side and end forming member 7a. Guide members 7b are provided along the upper and lower margins of the side and end forming member 7a, at the extremity of each leg thereof. The guides 7b provided on the leg forming a side of the box 7 are adapted to receive and slidably support a leg 7c of an end forming member 7d. The leg 7c is preferably integral with the end forming member 7d and disposed at right angles therewith at an extremity thereof. The remaining extremity of the end member 7d is provided at its upper and lower margins with guides 7e similar to the guides 7b. The guides 7e slidably receive a sliding plate 7f. A similar sliding plate 7f is slidably mounted between the guides of the end forming leg of the member 7a. The outer lower corners of the sliding plate 7f are provided with small loops 7g. The loops 7g journal pins provided at the lower corners of a gate member 7j. The gate member 7j comprises a main portion 7k having guides 7m similar to guides 7b which slidably receive an extensible portion 7n. The gate 7j is held in its vertical position adjacent the sliding plates 7f by catch members 7p. The sliding plates 7f, leg portion 7c, and extensible portion 7n are provided with suitable stops at their inner extremities so as to limit their outward movement with respect to the guides in which they fit. When the various shiftable members are in their extended positions, they occupy the positions shown in Fig. 5, by solid lines. By pressing inwardly on the sides and ends of the lettuce packing box, the side formed by the gate 7j and the end formed by the end member 7d of the box are shifted to the dotted line position shown in Fig. 5.

The lettuce packing frame 7 is shifted with the tray 3 into the framework 1 between a fixed side plate 8 and a movable sideplate 9 opposite to plate 8. These plates, together with movable plate 18 and an opposite fixed plate 17, presently described in detail, provide a frame for compressing the layer of lettuce placed between the several plates.

To support the lettuce packing frame and permit tray 3 to be removed, sideplates 8 and 9 are provided with inturned portions 8a and 9a, respectively, which are adapted to fit under the edges of the member 7a and gate member 7j forming the sides of the lettuce packing frame or box 7. To facilitate this the tray 3 is provided with longitudinally extending cleats or spacing members 3c which space the lower margins of the box 7 from the body of the tray 3.

The upper portion of the fixed side plate 8 is offset outwardly, that is, towards the uprights 1a forming the corners of the corresponding side of the framework, so as to form a supporting portion 8b extending between and secured to the aforementioned uprights. The upper portion of the movable side plate 9 is provided with upwardly directed arms 9b, the upper extremities of which are provided with rollers 9c. The arms 9b extend through slots 10a provided in a supporting bracket 10 secured between uprights 1a forming the corners of the corresponding side of the framework. The slots 10a are disposed horizontally and extend inwardly from said side. The rollers 9c are adapted to move along the upper side of the supporting brackets 10 adjacent the slots 1a.

Extending horizontally from the movable side plate 9 through the supporting portion 8b adjacent the extremities thereof are a pair of operating rods 11. The rods 11 extend beyond the framework 1 and are connected together by a cross head 12. The central portion of the cross head 12 is joined to a piston rod 13 which extends towards the framework and is provided with a suitable piston 14 which is slidable in a cylinder 15. The cylinder 15 is secured to the supporting portion 8b of the fixed side plate 8. Springs 16 extend between the supporting portion 8b of the fixed side plate 8 and the cross head 12. The springs 16 tend to draw the cross head 12 towards the framework and thereby shift the movable plate 9 away from the fixed plate 8. Operation of the cylinder causes the reverse movement.

The leg forming the end portion of the member 7a and the movable end member 7d are adapted to be engaged by a fixed end plate 17 and a movable end plate 18, respectively. The fixed end plate 17 is provided with an offset supporting portion 17a at its upper extremity which is joined to the uprights 1a forming the corners at the corresponding side of the framework.

The movable end plate 18 is provided with upwardly directed arms 18a which extend through slots 19a provided in a supporting bracket 19 extending between uprights marking the corners of the corresponding side of the framework. The upper extremities of the arms 18a are provided with suitable rollers 18b which ride upon the supporting bracket 19. The upper portion of the movable end plate 18 may be offset so as to clear the adjacent operating rod 11 associated with the movable side plate 9.

The movable end plate 18 not only moves bodily in a horizontal direction but also pivots about the axis of the rollers 18b so that the under side of the movable end plate 18 may be raised above the lettuce packing box 7, as shown by dotted lines in Fig. 2. In order to provide this movement the upper corners of the movable end plate 18 are provided with bracket bearings 18c which are joined to the one end of a pair of link members 20a which form elements of connecting means 20. The link members 20a extend along the inside of the supporting portion 8b of the fixed side plate 8 and along the outer side of the movable plate 9. The extremities of the link members 20a are pivotally connected to axially slidable connecting rods 20b which are guided by suitable sleeves or the like provided in the supporting portion 17a of the fixed end plate 17. The connecting rods 20b extend outwardly from the framework and their remaining ends are joined to a cross head 21 which is connected intermediate its ends to a piston rod 22. The piston rod 22 in turn is connected to a piston 23 which is slidable within a cylinder 24. The cylinder 24 is secured to the supporting portion 17a of the fixed end plate 17. Springs 25 extend between the supporting portion 17a of the fixed end plate and the cross head 21. These springs tend to hold the piston 23 in its inner position and the movable end plate 18 in its dotted line position shown in Fig. 2.

Below the side engaging plates and end engaging plates, and arranged in a substantially centered relation with the rectangular area delineated thereby, is a crate supporting frame 26. The crate supporting frame 26 may be provided with rollers 26a which support a crate C. The rollers 26a extend between side members 26b which may extend above the lower portions of the crate along the sides thereof and form guides for centering the crate. The crate supporting frame 26

may form a link in a roller conveyor mechanism, designated A, so that crates may be readily fed to the supporting frame 26 and removed therefrom when filled. The crate supporting frame 26 is vertically movable and is therefore mounted on a vertically disposed piston rod 27 which is joined to a piston 28 mounted in a vertically disposed cylinder 29 which may rest upon the floor upon which the framework 1 is mounted. Springs 30 extending between the floor and the supporting frame 26 yieldably hold the supporting frame in its lower position in alignment with the roller conveyor mechanism A, as shown in Fig. 2. The crate C may be centered longitudinally upon the supporting frame by means of a suitable stop 26c which is shiftable clear of the crate so as to permit the crate to be removed from the supporting frame. Action of the piston and cylinder raises the crate supporting frame 26 until the ends and sides of the crate fit over the end plates and side plates, respectively, as shown in Fig. 3, the tray 3 being removed for this operation.

Mounted within the area delineated by the side plates and end plates and normally disposed adjacent or above the upper margins thereof is an ejector member 31. The ejector member 31 is in the form of a rectangular frame which may be curved longitudinally if desired. The margins of the ejector member fit loosely within but adjacent the side and end members. At the extremities of one side, the ejector member is provided with a pair of vertically disposed upwardly extending guide posts 32 which are mounted in suitable bearings 1d provided in cross members 1e and 1f. The extremities of the remaining side of the ejector member may be joined to the guide posts 32 by suitable brackets or braces 33. The side of the ejector member which is joined to the guide posts 32 is also joined at its central portion to a piston rod 34 which is connected at its upper extremity to a piston 35 slidably mounted in a cylinder 36. The cylinder 36 is disposed in a vertical position and secured to the cross member 1f. Return springs 37 extend between the ejector member 31 and the cross frame 1f. The springs 37 yieldably hold the ejector in its upper position, shown in Figs. 1 and 2. The piston and cylinder operate to shift the ejector member to the position shown in Fig. 3.

Operation of the machine is as follows: The packing frames or boxes 7 are filled with a layer of lettuce and then conveyed to the shelf 2. The packing frame with a layer of lettuce therein is placed on the tray 3 and the tray is shifted within the framework 1, the packing frame passing underneath the end and engaging plate 18. This is done when the side engaging plate 9 is farthest from the side engaging plate 8 and the ejector 31 is in its elevated position. After the tray with lettuce packing frame thereof has been positioned between the side and end engaging plates providing the lettuce compressing frame, the pistons 14 and 23 are actuated so as to draw the plates to the position shown in Figs. 2 and 3, causing the inturned portions 8a and 9a of the side engaging plates to fit underneath the sides of the lettuce packing frame so as to support the same. The tray 3 is then withdrawn and the piston 28 actuated. This raises the crate supporting frame 26, a crate having first been positioned thereon. The crate C is slightly larger than the rectangular space defined by the side and end engaging plates so that the side walls of the crate may pass on the outer sides of said plates and thereby occupy the position shown in Fig. 3. When this is accomplished, the piston 35 is operated which causes the ejector 31 to shift downwardly and press the layer of lettuce into the crate C. The lettuce which has been previously compressed by the action of the side and end engaging plates which shift the packing frame to its smallest dimensions, expands slightly so as to fill the crate C. The operation is repeated until the crate is filled with lettuce, whereupon the crate is removed and a second one is placed in its stead. The ejector 31 being in the form of a rectangular frame open at its central postion allows crushed ice to be fed down through a suitable hopper H, indicated by dotted lines in Fig. 3, thus enabling a layer of ice to be placed between the layers of lettuce. After the lettuce has been ejected from the packing frame the tray 3 is reinserted thereunder and the side and end engaging plates are released, whereupon the empty frame and tray are shifted upon the shelf 2, whereupon the frame is placed on a return conveyor, not shown, which carries the packing frame to the point at which it received another layer of lettuce.

Though I have shown and described a particular construction, combination and arrangements of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a lettuce packing machine, means for positioning a crate, a rectangular frame including a fixed side, a fixed end, a movable side, a movable end shiftable in right angular relation with said fixed side and said fixed end respectively, whereby said frame may be contracted or enlarged, and stop means for limiting further collapsing movement when said packing frame confines a predetermined area less than the free cross-sectional area of a positioned crate, fixed engaging means arranged to coact with two sides of said packing frame, movable engaging means arranged to coact with the other two sides of said packing frame for contracting said packing frame to a size determined by said stop means, said positioning means placing said crate in receptive relation with respect to said packing frame wherein said crate surrounds said frame and said frame is partially within a positioned crate, and an ejector for forcing said layer of lettuce from said packing frame into said crate.

2. In a lettuce packing machine, a rectangular frame including a fixed side, a fixed end, a movable side, a movable end shiftable in right angular relation with said fixed side and said fixed end respectively, whereby said frame may be so contracted or enlarged, and stop means for limiting further collapsing movement when said packing frame occupies a predetermined area, fixed engaging means arranged to coact with two sides of said packing frame, movable engaging means arranged to coact with the other two sides of said packing frame for contracting said packing frame to a size determined by said stop means, said fixed and movable engaging means and packing frame being insertable into a crate, and mechanism for forcing the lettuce held by said frame into said crate.

3. In a machine of the character described, means for delivering a group of articles loosely

assembled into a package of predetermined shape and size, means for compressing said articles into a package of less than said predetermined size and temporarily retaining said articles in package form in said state of compression, means for positioning a crate about at least a portion of said compressing means, and a reciprocable plunger for forcing said package, while compressed in said compressing means, into said crate wherein said package can expand.

4. In a machine of the character described, means for delivering a group of articles loosely assembled into a package of a predetermined shape, means for compressing said articles and temporarily retaining said articles in package form in a state of compression, means for positioning a crate beneath said compressing means, a vertically reciprocable plunger for forcing said package, while compressed in said compressing means, down into said crate, said compressing means including a plurality of cooperating planar members which are positioned vertically and within the projected confines of the crate beneath said compressing means to provide a chute for said package at least just prior to operation of said plunger and means for moving a positioned crate relative to said planar members to position said members within said crate and enable said compressing means to discharge said compressed package directly into said positioned crate.

5. In a machine of the character described, means for delivering a group of articles loosely assembled into a package of a predetermined shape, means for compressing said articles and temporarily retaining said articles in package form in a state of compression, means for positioning a crate beneath said compressing means, a vertically reciprocable plunger for forcing said package, while compressed in said compressing means, down into said crate, said compressing means including a plurality of cooperating planar members, means for moving said planar members into a position in which said members are positioned vertically and within the projected confines of the crate beneath said compressing means to provide a chute for said package at least just prior to operation of said plunger and means for moving a positioned crate relative to said planar members to position said members within said crate and enable said compressing means to discharge said compressed package directly into said positioned crate.

6. In a machine of the character described, means for delivering a group of articles loosely assembled into a package of a predetermined shape, means for compressing said articles and temporarily retaining said articles in package form in a state of compression, means for positioning a crate beneath said compressing means, a vertically reciprocable plunger for forcing said package, while compressed in said compressing means, down into said crate, said compressing means including a plurality of cooperating planar members which are positioned vertically and within the projected confines of the crate beneath said compressing means to provide a chute for said package at least just prior to operation of said plunger, means for discharging crushed ice through said compressing means onto said package in said crate and means for moving a positioned crate relative to said planar members to position said members within said crate and enable said compressing means to discharge said compressed package directly into said positioned crate.

7. In a machine of the character described, means for positioning a crate in a package receiving position, package forming and delivery means spaced vertically above a positioned crate for forming a plurality of articles into a compressed package wherein said articles are positively compressed and reduced in size from a loose package of larger cross sectional area than said crate to an area of a size less than that of said crate, said package forming and delivery means being movable into a vertical position wherein said means provides a chute for said compressed articles extending into said positioned crate, and a reciprocating ram for moving a compressed package out of said forming means directly into said crate wherein said package can expand.

8. In a machine of the character described, means for positioning a crate in a package receiving position, package forming and delivery means spaced vertically above a positioned crate for forming a plurality of articles into a compressed package, a reciprocating ram for moving a compressed package out of said forming means and into said crate and means for discharging ice through said ram onto said package in said crate.

9. In a machine of the character described, means for positioning a crate in a package receiving position, package forming and delivery means spaced vertically above a positioned crate for forming a plurality of articles into a compressed package, said forming means including a plurality of planar members movable into a vertical position in which each member is substantially parallel to a wall of said crate, means for moving a positioned crate relative to said walls to position said walls within said crate, and a reciprocating ram for moving a compressed package out of said forming means and into said crate.

10. In a machine of the character described, an article packing frame including a plurality of movable members, means for moving said members to contract said frame and compress articles placed in layer form within the confines of said frame, means for moving a crate to surround said frame partially at least to receive articles assembled and compressed by said frame, and an ejector for forcing said compressed layer into said crate.

11. In a machine of the character described, an article compressing frame including a plurality of movable members, means for depositing within the confines of said frame a preformed layer made up of a plurality of rows of said articles, means for moving said members to contract said frame and compress articles placed in layer form within the confines of said frame, means for positioning a crate to receive articles assembled and compressed by said frame, an ejector for forcing said compressed layer into said crate, and means for discharging ice fragments through said ejector on to said layer.

12. In a machine of the character described, means for supporting a crate, means for delivering a plurality of articles in single layer form and in a loosely compacted condition corresponding roughly in outline to that of said crate, means for compressing said plurality of delivered articles while retaining said outline into a mass of a size less than that of said crate, and wherein said

articles are disposed in a single layer, means for positioning said crate relative to said compressing means to receive said compressed article in said mass form, said compressing means including a plurality of planar members vertically arranged and movable relative to each other horizontally to compress and to engage said mass and to provide a chute extending into a positioned crate to deposit said mass in said crate and means for forcing said mass in said layer form through said chute and into said positioned crate wherein said mass is disposed in single layer form.

13. In a machine of the character described, means for supporting a crate, means for delivering a plurality of articles in single layer form and in a loosely compacted condition corresponding roughly in outline to that of said crate, means for compressing said plurality of delivered articles while retaining said outline into a mass of a size less than that of said crate, and wherein said articles are disposed in a single layer, means for positioning said crate relative to said compressing means to receive said compressed article in said mass form, said compressing means including a plurality of planar members vertically arranged and movable relative to each other horizontally to compress and to engage said mass and to provide a chute for said mass, means for forcing said mass in said layer form through said chute and into said positioned crate wherein said mass is disposed in single layer form, and means for discharging ice through said forcing means onto said mass.

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