To all whom it may concern:

Be it known that I, JOHN MATTSON, a citizen of the United States, residing at Dresser Junction, in the county of Polk and State of Wisconsin, have invented a new and useful Butter-Packing Machine, of which the following is a specification.

The object of the present invention is to provide an improved means for packing butter and other material in tabs or other receptacles, and has for its principal object to provide a mechanism of simple construction by which plastic material may be forced under any desired pressure into the receptacle without injuring the quality of the material and with comparatively little exertion on the part of the operator.

A further object of the invention is to provide a machine in which the pressure on the butter or other material operates automatically to stop the pressing operation at a predetermined point in order to avoid injury to the material or damage to the machine.

A still further object of the invention is to provide improved means for stripping the packing-plunger and automatically removing the plastic material clinging thereto after each compressing operation.

A still further object of the invention is to provide a machine in which a plurality of receptacles may be placed and moved one by one under the packing-plunger, the mechanism being so arranged as to automatically stop the movement each time a receptacle comes into alignment with the plunger.

A still further object of the invention is to provide for the automatic reversal and removal of the plunger and to control automatically the operation of the power-transmitting devices and the movement of the stripper with relation to the plunger.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a vertical sectional view of a butter-packing machine constructed in accordance with the invention. Fig. 2 is a plan view of the principal portions of the machine. Fig. 3 is a sectional plan view of the machine on the line 3-3 of Fig. 1. Fig. 4 is a detail perspective view of the plunger, the stripper, and other operating mechanisms. Fig. 5 is a sectional plan view of the stripper-locking mechanisms. Fig. 6 is a detail view of the plunger and stripper, showing the position assumed by the parts as they move downward into engagement with the material to be packed. Fig. 7 is a similar view showing the movement of the plunger in advance of or below the stripper. Fig. 8 is a detail perspective view of the mechanism for locking the clutching mechanism in operative position. Fig. 9 is a transverse sectional view of the lower portion of the machine, illustrating the relative positions of one of the receptacle-carriers and the scale-beam connection. Fig. 10 is a detail perspective view of the scale-beam detached.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The various working parts of the machine are supported on a suitable frame 10, that preferably is formed of structural iron. At the top of the frame are bearings for the reception of a main shaft 11, carrying a fast 85 pulley 12 and two loose pulleys 13 and 14. To the pulley 14 is rigidly secured a small pulley 15, that also rotates loosely on the shaft. These pulleys are engaged by two belts, a straight belt 16 being normally in engagement with the pulley 13, and a crossed belt 17 being normally in engagement with the loose pulley 14, so that both belts may be driven from a single-line shaft for imparting movement in opposite directions, respectively, to the two loose pulleys. The shaft 11 is provided at one end with a bevel-pinion 19, intermeshing with a bevel-gear 20, the hub of which has an internal thread and forms a nut for engagement with a vertically-disposed screw 21, that carries the compression-plunger and operates in the manner hereinafter described.

The frame is further provided with bearings for a vertical shaft 23, having at its lower end a spider 24, from which project a number of arms 25, of slightly-elastic material, the arms serving as carriers for the receptacles 2.
in which the butter or other material is to be packed. At the upper end of the shaft 25 is secured a worm-wheel 27, with which intermeshes a worm 28, carried by a horizontally-disposed shaft 29. On this shaft is a loose pulley 30, that is connected by a belt 31 to the pulley 16 on the shaft 11. The hub of the pulley 30 has a clutch-face which may be engaged by a clutching-sleeve 32, feathered on the shaft 28 and under the control of a shifting lever 33, that is pivoted on a frame or bracket member 34. The upper end of the clutch-operating lever is connected to a fixed portion of the frame by a helical tension-spring 35, that tends normally to maintain the clutch in release position, so that the pulley rotates idly on the shaft. Extending from the clutch-operating lever is an arm 36, the outer portion of which is guided in a suitable opening formed in a hanger 37, and in the upper edge of this arm is a notch 38, with which engages one end to a hanger 40, the free end of the lever being connected to one end of a tension-spring 41, that tends normally to hold the lever down and to force it into notch 38, so that if the arm is moved with the lever to clutching position the notch will be placed opposite the lever 39, and the latter will enter the notch and hold the clutch tightly against the clutching-face of the hub of wheel 30, thus locking the latter to the shaft 29 and permitting the transmission of rotative movement through the worm-gearing to the shaft 23 and the receptacle-carrying arms. The free end of the lever 39 is connected by a cord or chain 42 to the outer end of a lever 43, that is pivoted on a bracket 44, extending from the base portion of the machine, and from the inner end of the lever extends an arm 45, arranged to be engaged by fingers 46, projecting from the receptacle-carrying arms, the arm 45 having an inclined face forming a cam with which the fingers successively engage and serve to transmit movement through the lever 43 and cord or chain 42 to the lever 49. When this occurs, arm 39 is raised from the notch 38 and the spring 35 operates the lever 33 to move the clutch to release position, this mechanism serving as a means for automatically stopping the successive receptacles in alignment with the plunger.

The receptacle-holders are preferably in the form of arms 50, secured to the outer ends of the yieldable arms 25, two of such arms 50 being provided with prongs or teeth for engaging the receptacles, while the third has an adjustable tooth or screw 51 for the purpose of locking the receptacle in place. One of the arms 50 carries an operating-tongue 46 for effecting the release of the clutching mechanism.

The screw 21 extends through the threaded hub of the bevel-wheel 20, while the lower portion of the screw is unthreaded and extends through an opening formed in a bracket 56, said bracket having a key or tongue 57, that extends into a vertical keyway formed in the unthreaded portion of the screw to prevent rotative movement of the latter. The screw constitutes a plunger-carrier, and to its lower end is secured a plunger 59, that may be formed of wood or other material and may be of any desired shape to correspond to the shape of the receptacles being filled.

Secured to the bracket 56 and extending from thence to the top of the frame is a rigid ratchet-bar 60, having teeth arranged at regular intervals, and with these teeth engages a pawl 61, pivoted on a stud 62, that is carried by a plate 63, having an opening for the free passage of the rack-bar. A spring 64, extending between the plate and pawl, serves to maintain the latter in engagement with the teeth of the rack-bar.

The plate 63 is rigidly secured to the upper end of a stripper-carrying rod 67, that passes freely through a guiding-opening formed in the bracket 56, and at its lower end is secured to a yoke 68, having at its central portion an opening for the passage of the plunger-carrier 21. This yoke carries a stripper 69, which completely encircles the periphery of the plunger and serves to strip therefrom any material which may cling to the plunger after its compression movement. In order to avoid excessive independent downward movement of the plunger, the carrying-rod 21 is provided with a shoulder 70, which engages against the yoke 68 in order to force the stripper down with the carrier after the plunger has moved a limited distance.

Secured to the plunger-carrying rod 21 is a cam 72, that is arranged to engage the tail of the pawl 61, and when the plunger-rod moves up a predetermined distance this cam will engage the tail of the pawl and will move the latter from engagement with the teeth of the rack-bar and on continuing the upward movement the plunger and stripper will travel together to the end of the upstroke, the lower end of the cam having a recessed shoulder, which by engagement with the pawl imparts upward movement to the latter and elevates the stripper-rod and stripper. The plunger-rod is further provided with a projecting stud 73, that is arranged to engage with an arm 74, projecting from a rock-shaft 75, adapted to suitable bearings in a bracket 76, carried by the main frame, and when this shaft is turned by engagement of the stud 73 with the arm 74 the straight belt 16 will be shifted from the fast pulley 12 to the loose pulley 13.

The upper portion of the frame is provided with two sets of grooved rollers 77, which serve as supports for a shifter-rod 78, carrying fingers 79, that extend on opposite sides of the belt 16. One end of the rod is connected to an arm 80, projecting from the rock-shaft 75, while the opposite end thereof is connected.
by a flexible cord or chain 81 to a weight 82, that tends normally to move the shifter to such position that the straight belt 16 will be in engagement with the fast pulley 12, and when the plunger is fully up and stud 73 is engaged with the arm 74 the belt will be shifted to the loose pulley, as shown in Fig. 1. Arranged in vertical alignment with the plunger and disposed at a point below the plane of the carrier-arms 25 is a lever 82', one end of which is pivoted to a bracket 83 on the base portion of the frame, while the opposite end is adjustably connected by a link 84 to an approximately horizontal scale-beam 85. The lever 82' is provided with a transversely-extending block 86, having a rounded upper face over which the outer portions of the receptacle-carrying arm 25 may pass, and said arms are stopped immediately over this block, so that during the compressing operation the downward movement of the plunger will be transmitted to the material being compressed and the receptacle to the arm 25, and thence through block 86 to lever 82, and from the latter to the scale-beam 85.

The scale-beam 85 is approximately U shape in form, its short arm 87 and long arm 88 being pivoted to the oppositely-disposed vertical standards of the frame, while the longer arm is continued to the opposite side of the machine and is provided with a counterweight or poise 90, which may offer any desired resistance to the movement of the beam under the downstroke of the plunger, and by adjusting this weight in accordance with the character of the material being packed any desired pressure may be exerted on the material before the scale-beam is moved.

The upper portion of the frame is provided with suitable studs for the support of grooved rollers 92 for the reception of a belt-shifter rod 93, having a pair of fingers 94, which extend on opposite sides of the crossed belt 17. This rod is provided with a projecting arm 85, that is connected by a flexible cord or chain 96 to a weight 97, tending normally to shift the rod to the right of Fig. 1 and to maintain the crossed belt in engagement with the loose pulley 14. The opposite end of the shifter-rod 93 is connected to a rocker-arm 95, carried by a rock-shaft 99, that is mounted in bearings in a suitable hanger carried by the frame. The rock-shaft further carries an arm 100, which is held up by a spring 101, the spring also tending to move the shifter-rod to the right and maintain the crossed belt in engagement with the loose pulley 14.

At one side of the frame of the machine is pivoted a stop-lever 101', which may move across the end of the shifter-rod 93 and prevent its movement to the right, so that the shifter-rod will be held in the position shown in full lines in Fig. 1, with the crossed belt in engagement with the fast pulley 12, this being the position assumed while the screw is being forced down during the compressing operation. To the outer portion of the scale-beam is connected a vertically-disposed bar 102, the upper end of which passes through a suitable guide 103, projecting from the frame, and secured to said bar is an arm 104, arranged below the stop-lever 101' and normally out of contact therewith. If the scale-beam is raised, however, the arm 104 will engage the stop-lever 101' and raise the latter free of the shifter-rod 93, and the latter will then be moved to the right under the influence of weight 97 and spring 101, shifting the belt from the fast pulley 12 to the loose pulley 14.

The adjacent arms or fingers of the two shifting devices are arranged to interlock during movement in one direction. The shifting finger 94' projects to the right and in the path of movement of the finger 79', and if the parts are in the position shown in Fig. 1 and both belt-shifters are locked by engagement of the shifter-rod 93 with the stop-lever 101' a release movement of the stop-lever will permit both the shifting-rod 78 and 93 to travel to the right, so that the belt 16 will be shifted 99 to the fast pulley 12 and the belt 17 will be shifted to the loose pulley 14 and the screw 21 will be moved in the opposite direction.

As the lower portion of the machine is arranged two pedals 110 and 111. The pedal 110 is connected by a flexible cord or chain 112 to the upper end of the clutch-operating lever 83, so that when the pedal is depressed by the operator the clutch will be moved from release position to engaging position and movement will be transmitted to the carrier-arms. The pedal 111 is connected by a flexible cord or chain 113 to the rock-roller arm 100, and when the latter is depressed the belt-shifting rod 93 will be moved to the left, effecting the shifting of belt 17 from the loose pulley 14 to the tight pulley 12.

In the operation of the device the operator stands in front of the machine within convenient reach of the two pedals 110 and 111. If butter is being packed in tubs or similar receptacles previously mounted on the carrier-arms, a quantity of butter—say ten or twelve pounds—is placed in the receptacle then in front of the operator. The pedal 110 is then depressed, and this movement causes clutch 32 to interlock with the clutch-face on the hub of pulley 30, it being understood that at this time the crossed belt 17 is driving the loose pulley 14. Movement is thereupon transmitted from the crossed belt through the pulley 14 to pulley 15, belt 31, pulley 30, shaft 29, worm 28, worm-wheel 27 to shaft 23, and to the carrier. The carrier-arm is revolved until one of the fingers 46 strikes the cam-shaped face of the arm 45. This depresses the outer end of lever 43, and the downward movement is transmitted through the flexible cord or chain 42 to the lever 39, raising the latter from the notch 38, into which it had
previously dropped when the clutch was moved to operative position. When the locking-lever 33 is raised, spring 36 moves the clutch to release position, and the receptacle halts at a point under the plunger. The operator then places another quantity of butter in the second receptacle, which is by this time in a position in front of him, and then depresses the pedal 111. This movement is transmitted to the belt-shifter rod 93, and the belt 17 is moved from the loose pulley 14 to the fast pulley 12, whereupon shaft 11 is turned and the bevel-gear 20, constituting the nut of the screw 21, is revolved and the plunger-carrying rod descends. During the descent of the plunger-carrying rod the cam 72 moves away from the tail of the pawl 61, leaving the latter free to move into engagement with the rack-bar. The plunger moves down, together with the stripper, the latter moving by gravity, and in some cases the cam 72 will not have moved fully away from the pawl 61. During this downward movement the lower face of the stripper will usually be slightly below the lower face of the plunger until the stripper is stopped by contact with the material being compressed. The positive downward movement of the plunger thereupon insures movement of the cam 72 away from the pawl, and the latter is then in position to engage and click past tooth after tooth of the rack-bar. When the compression movement has been completed or when sufficient pressure has been exerted for the purpose, the arm 25 yields and, moving it into engagement with block 86, forces the latter down and lever 82' descends, the movement being transmitted to the scale-beam. The outer end of the scale-beam being raised elevates the bar 102, and arm 108 engages and elevates the stop-lever 101'. When the lever 101' is moved away from the end of the shifting rod 93, the weight 97 and spring 101 will move said shifter-rod to the right, and at the same time shifter-rod 78 will be moved to the right, causing belt 16 to move to the fast pulley 12 and the crossed belt 17 to move from the fast pulley 12 to the loose pulley 14. This instantaneously reverses the direction of rotation of the shaft 11 and the bevel-gear 20. The screw is then raised and the plunger starts its upward movement; but the stripper has been locked from upward movement by the engagement of its pawl with one of the teeth of the rigid rack-bar. The plunger moves up until its lower edge is well within the stripper and the butter or other plastic material clinging to the sides of said plunger has been removed. The cam 72 then engages the pawl 61 and moves the latter from the rack-teeth, and on further movement the recessed block at the lower end of the cam engages and elevates the pawl, together with the stripper-rod and stripper, and all of the parts move up together until the stud 73 engages the bell-crank lever 74. This movement is transmitted to the shifter-rod 78 and the latter is moved to the left, transferring the straight belt from the fast pulley 12 to the loose pulley 13, so that the machine is automatically stopped when the plunger has been fully elevated. The parts are now in readiness for a second operation, and by depressing the pedal 110 the clutch 32 may again operate for another cycle of operations.

While a single compression movement is all that is necessary in many cases, it is desirable, especially in the packing of butter, to add small quantities of butter—say from ten to twelve pounds at a time—so that the compression will be more even and regular and may be accomplished without injury to the grain of the butter. During the latter part of the operation the receptacles will be heavier from the accumulated material, and more weights may be added to the scale-beam to compensate for such increased weight, so that while the weight of the material is increased the pressure exerted will be the same at all times. Having thus described the invention, what is claimed is—

1. In a press, a yieldably-mounted receptacle-support, a compression member in alignment therewith, an operating means for the compression member, and a controlling device arranged under the yieldable support and movable by engagement of the support therewith when the pressure has reached a predetermined point.

2. In a press, a yieldably-mounted receptacle-support, a compression member in alignment therewith, an operating means for the compression member, and a controlling device for stopping and reversing the direction of movement of the operating member, said controlling device being arranged under the yieldable support and operable by the engagement of the support therewith.

3. In a press, a scale-beam, a receptacle-support connected thereto, and an operating means under the control of the scale-beam.

4. In a press, a scale-beam, a compression member the movement of which is transmitted to the beam, and operating means under the control of the beam.

5. In combination, a scale-beam, a compression member the movement of which is resisted by the beam, and a compression-member-operating means under the control of the beam.

6. In combination, a scale-beam, a receptacle the weight of which is imposed on the load end of the beam, a compression member for packing material in the receptacle and the movement of which is resisted by the poise end of the beam, and a compression-member-operating means under the control of the beam.

7. In a press, a scale-beam having an adjustable poise, a compression member, a receptacle for receiving material to be acted upon by the compression member, the movement of the compression member and the weight of the
receptacle and its contents being imposed on the load end of the beam during a portion of the pressing operation, and a compression-member-operating means under the control of the scale-beam.

8. In combination, a scale-beam, a lever connected thereto, a receptacle-support arranged over the lever, a plunger in the line of the support, a threaded rod carrying said plunger, a nut engaging said threaded rod, a nut-operating means, and mechanism under the control of the scale-beam for determining the direction of movement of the nut.

9. The combination with a scale-beam, of a yieldable receptacle-support, a lever connected to the scale-beam and arranged under the support, a plunger for packing material in the receptacle, a threaded rod carrying said plunger, a nut on said threaded rod, and automatic means controlled by the extent of movement of the scale-beam for stopping the downward movement of the plunger when the compression has reached a predetermined stage.

10. In apparatus of the class described, a plunger, a stripper surrounding the plunger and movable therewith, the downward movement of the stripper being checked by engagement with the material being packed.

11. In apparatus of the class described, a plunger, a stripper surrounding the same and movable therewith, and means for locking the stripper for movement during the initial back stroke of the plunger.

12. In apparatus of the class described, a plunger and stripper, an operating means for effecting an initial movement of the plunger and then a simultaneous movement of the plunger and stripper.

13. In apparatus of the class described, a plunger and stripper, means for locking the stripper from movement, and means for unlocking the stripper after initial movement of the plunger.

14. In apparatus of the class described, a plunger and stripper, a stripper-locking means, a plunger-operating mechanism, and means controllable by the movement of the plunger for unlocking the stripper and permitting its upward movement with the plunger.

15. The combination with an intermittently-revolvable receptacle-support, of a plunger, a threaded rod carrying the same, a bevel-wheel the hub of which forms a nut on said threaded rod, a shaft, the bevel-wheel carried thereby and intermeshing with the bevel-wheel on the rod, and means controllable by the movement of the plunger for determining the stopping and direction of rotation of said shaft.

16. The combination with a revolvable receptacle-support, of a plunger, a threaded rod carrying the same, a bevel-wheel forming a nut on said threaded rod, a shaft having a bevel-wheel intermeshing with the first bevel-wheel, pulleys on the shaft, belts running over said pulleys, and belt-shifters controlled by the movement of the plunger in opposite directions.

17. The combination with an intermittently-revolvable receptacle-support, of a compression-plunger, a threaded rod carrying the same, a bevel-wheel forming a nut on said rod, a shaft, the bevel-gear carried thereby and intermeshing with the bevel-wheel, pulleys on said shaft, belt-shifters movable on completion of the upward movement of the plunger, and means operable at the completion of the downward movement of the plunger for operating said belt-shifters.

18. The combination with a revolvable receptacle-support, of a plunger, a threaded rod carrying the same, a bevel-wheel mounted on the rod and forming a nut therefor, a shaft, a bevel-gear carried by the shaft and intermeshing with the bevel-wheel, pulleys on said shaft, belts passing over the pulleys, a belt-shifter, a lever carrying the same and operable at the completion of upward movement of the plunger, a second belt-shifter, a trowel for operating the same in one direction, a locking-lever for maintaining said second belt-shifter in adjusted position, and means operable on downward movement of the receptacle-carrier for moving said lever to released position.

19. The combination with an intermittently-revolvable receptacle-support, of a plunger, a threaded rod carrying the same, a bevel-wheel forming a nut on said rod, a shaft, a bevel-gear carried thereby and intermeshing with the bevel-wheel, a fast pulley, and a pair of loose pulleys mounted on the shaft, a pair of belts arranged to drive the pulleys, said belts running in opposite directions, respectively, a pair of belt-shifters engaging said belts, means tending to move the belt-shifters in one direction, a locking device releasable on completion of downward movement of the plunger for permitting movement of the bevels to reverse the direction of rotation of the bevel-wheel, a lever operable on completion of upward movement of the plunger for shifting one of the belts, and a pedal-actuated mechanism for shifting the second belt.

20. In an apparatus of the class described, a revolvable receptacle-support, a plunger, means for raising and lowering the plunger, a stripper for said plunger, a stripper-carrying bar, a pawl supported thereby, a rack-bar with which said pawl may engage, and means controllable by the movement of the plunger for releasing the pawl.

21. In an apparatus of the class described, the combination with an intermittently-revolvable receptacle-support, a plunger, a threaded rod carrying the same, a revolvable nut on said rod, a vertically-guided bar secured to the plunger and extending parallel with the threaded rod, a plate or frame secured to said vertically-guided rod, a pawl carried by the plate, a rack-bar with which said pawl may
engage, a cam carried by the threaded rod and adapted to engage said pawl, said cam having a recessed shoulder for positively engaging the threaded rod with the plate, and

5 a stripper supported by and movable with the plate.

22. The combination with an intermittently-revoluble receptacle-support, of a shaft carrying the same, a worm-wheel on the shaft, a worm meshing with the wheel, a worm-shaft, a loose driving-pulley arranged on the shaft and having a clutch-face, a clutch member feathered to the shaft, a clutch-operating lever, means for locking said lever in clutching position, and means controlled by the revoluble movement of the receptacle-support for releasing said lever.

23. The combination with a receptacle-support, of a shaft carrying the same, a worm-wheel on the shaft, a worm-intermeshing with the worm-wheel, a worm-carrying shaft, a loose pulley mounted on the worm-carrying shaft and having a clutch-face, a clutch member feathered on the worm-shaft, an operating-lever engaging said clutch, a locking-bar connected to the lever and having a notch, a locking-lever arranged to engage said notch, means controlled by the receptacle-support for moving the locking-lever to released position, a pedal-actuated mechanism for moving the clutch-lever in one direction, and a spring for moving said clutch-lever in the opposite direction.

24. In an apparatus of the class described, a frame, a revoluble receptacle-support comprising a plurality of yieldable arms, a shaft to which said arms are secured, a worm-wheel on said shaft, a worm intermeshing with the worm-wheel, a worm-carrying shaft, a loose belt-wheel mounted thereon and having a clutch-face, a clutching member feathered on the worm-shaft, a clutch-operating lever, a spring tending to move the lever in one direction, a pedal mechanism for moving the lever in the opposite direction, a notched locking-bar connected to the pedal-lever, a locking-lever arranged to engage in said notch, a cam-lever connected to the locking-lever and having an arm in the path of movement of the receptacle-carrier, a plunger, means for operating the same, a scale-beam, and a lever connected to the scale-beam and having a cam-shaped block arranged below the plunger and over which the receptacle-carrying arms are successively moved.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN MATTSON.

Witnesses:

JEAN A. SLEEPER,
A. H. LYNCH.