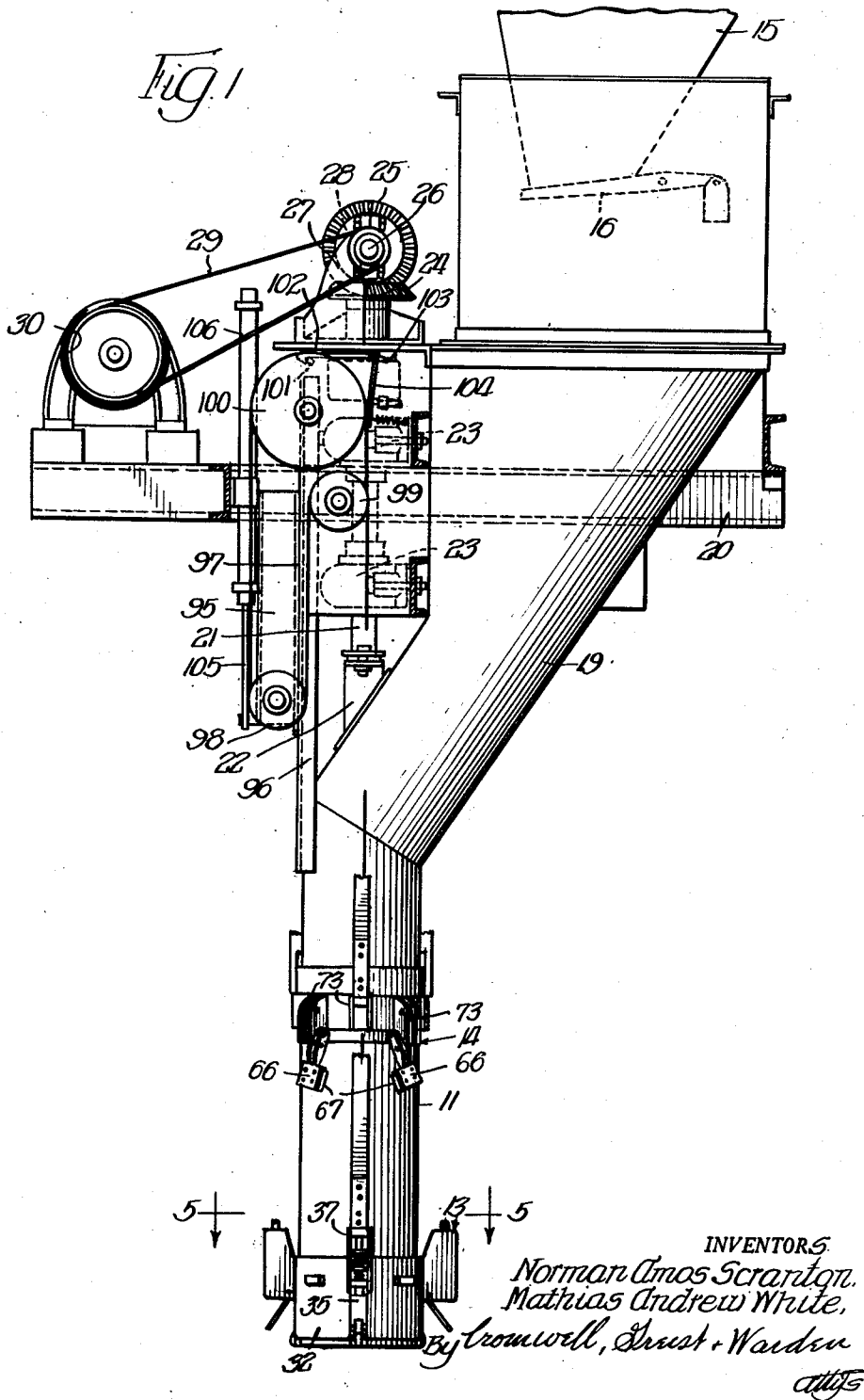


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BAG FILLING TUBE AND ASSOCIATED BAG TOP GRIPPING APPARATUS

Filed Nov. 2, 1948

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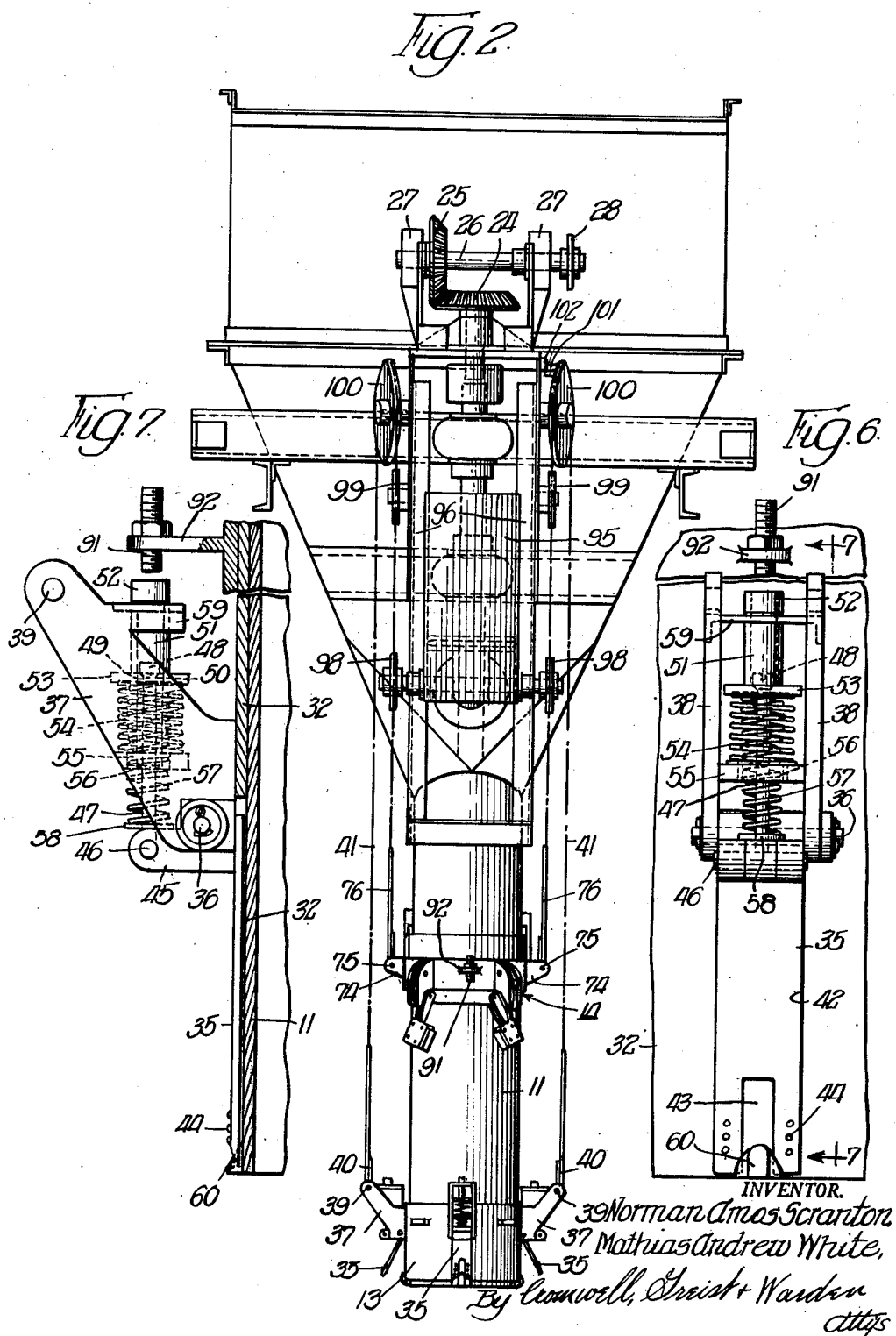


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BAG FILLING TUBE AND ASSOCIATED BAG TOP GRIPPING APPARATUS

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June 30, 1953

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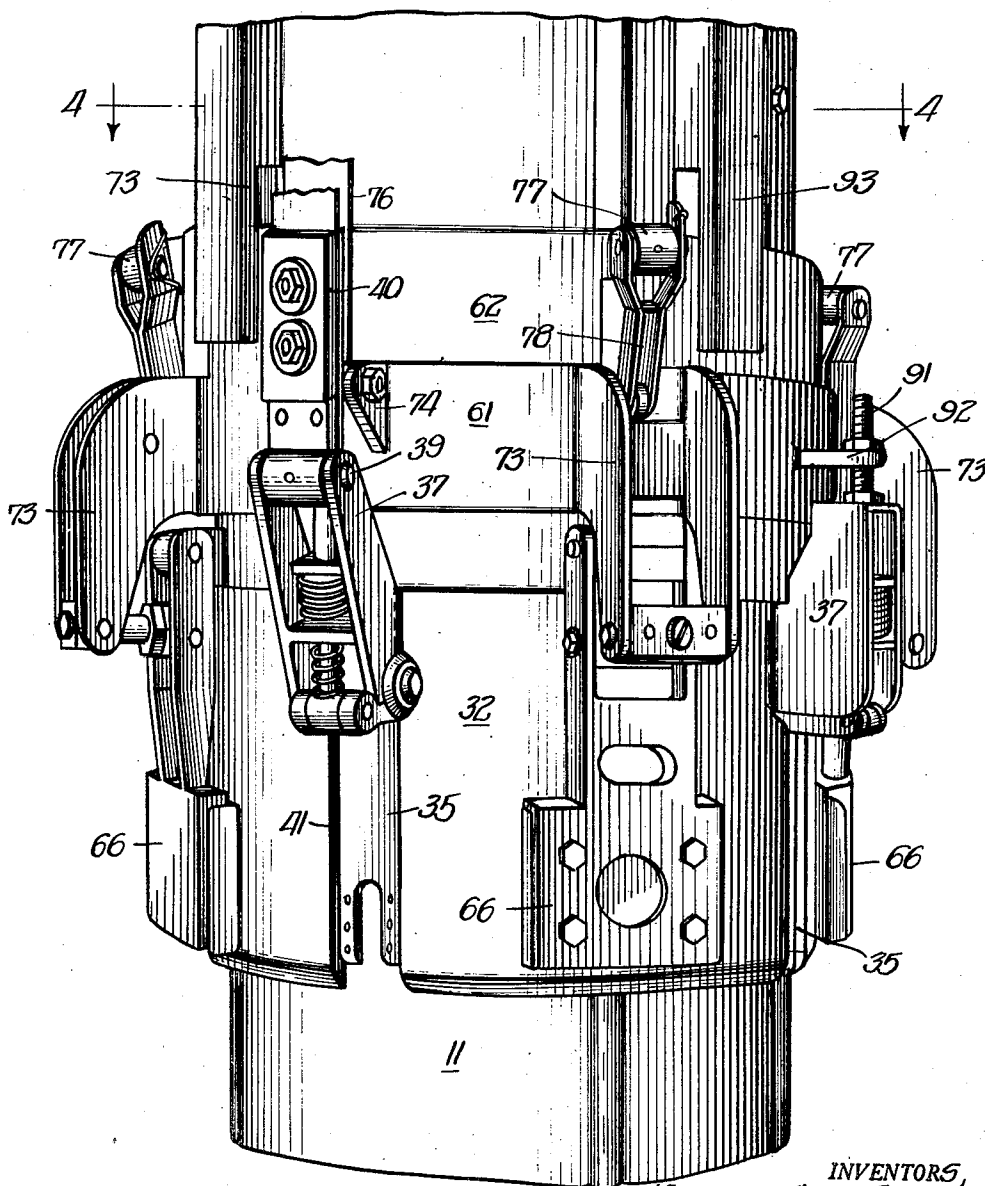
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BAG FILLING TUBE AND ASSOCIATED BAG TOP GRIPPING APPARATUS

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Fig. 3



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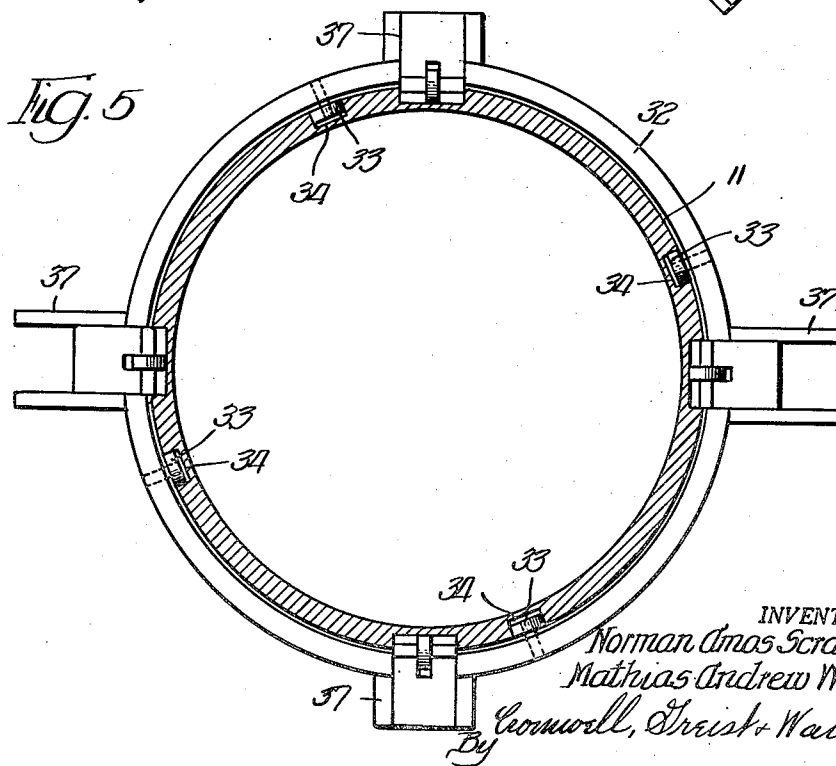
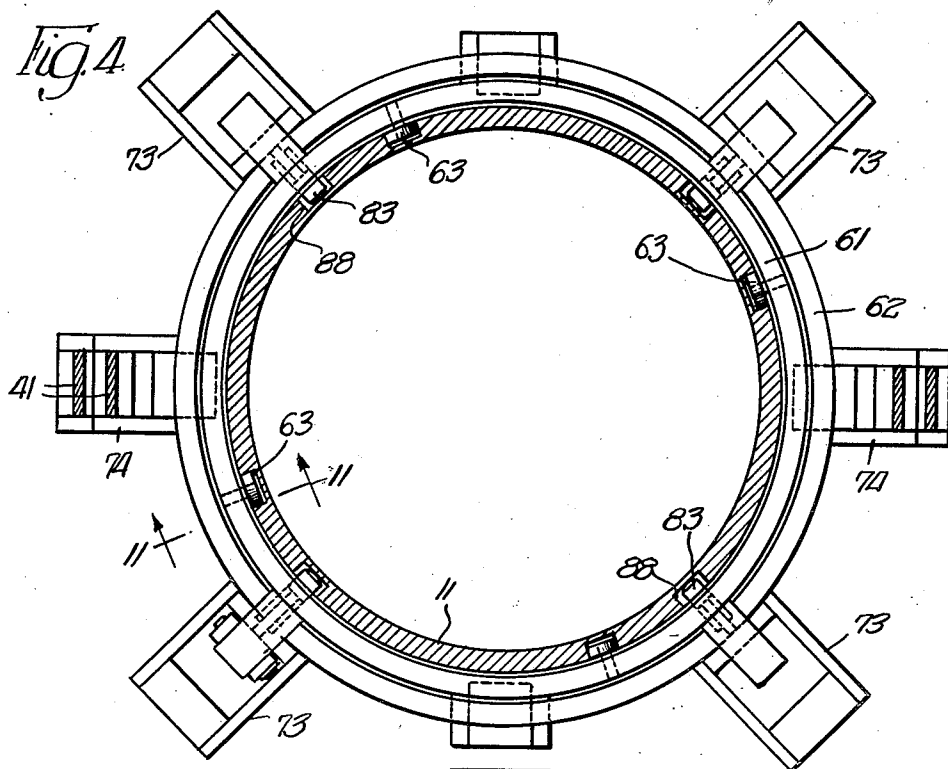
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BAG FILLING TUBE AND ASSOCIATED BAG TOP GRIPPING APPARATUS

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7 Sheets-Sheet 4



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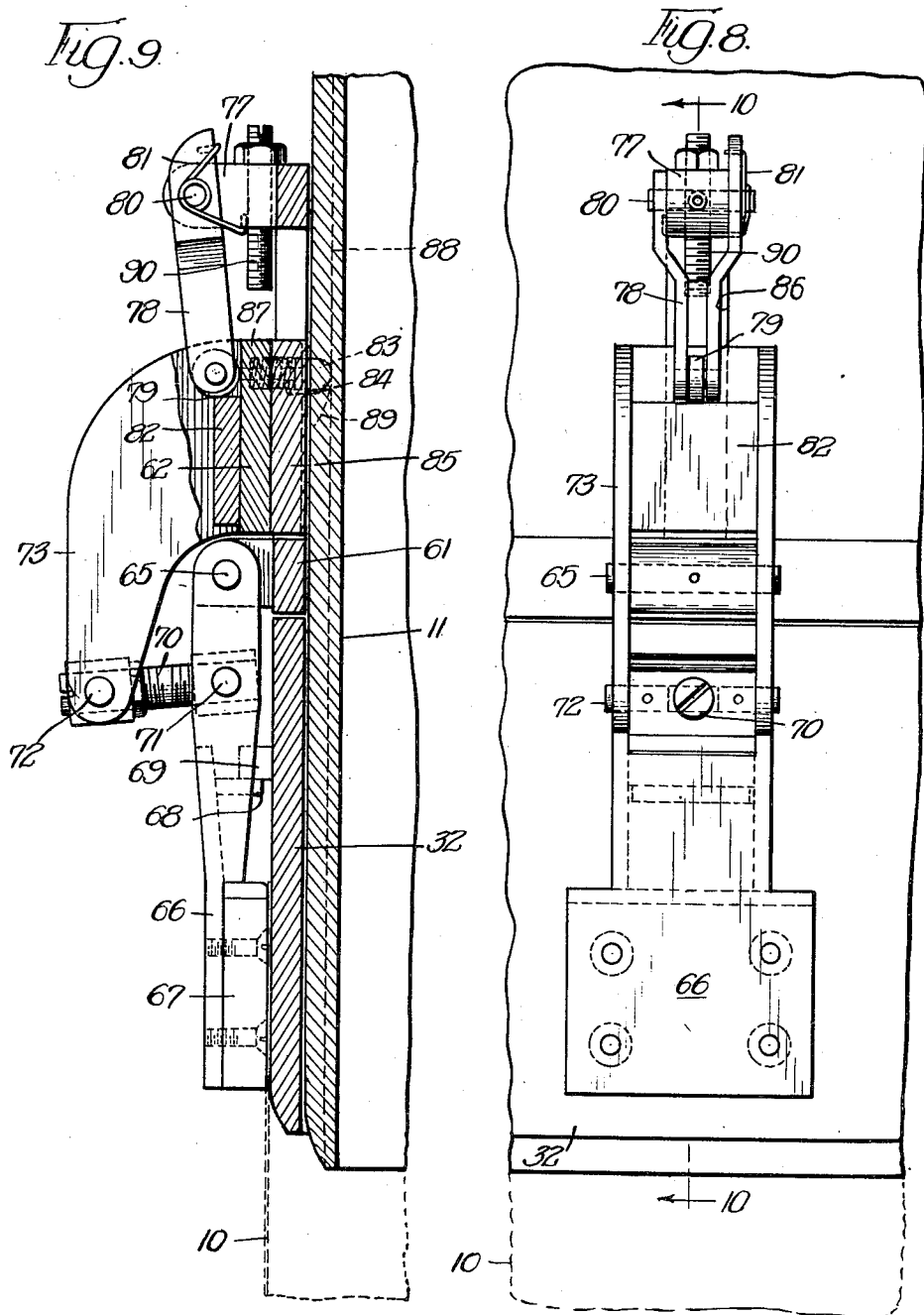
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BAG FILLING TUBE AND ASSOCIATED BAG TOP GRIPPING APPARATUS

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BAG FILLING TUBE AND ASSOCIATED BAG TOP GRIPPING APPARATUS

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Fig. 10.

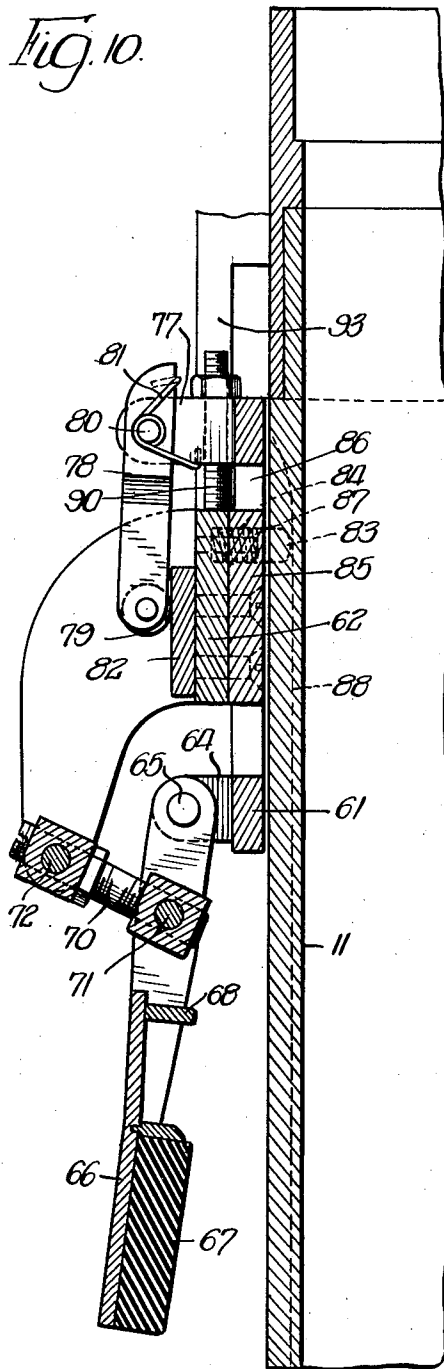
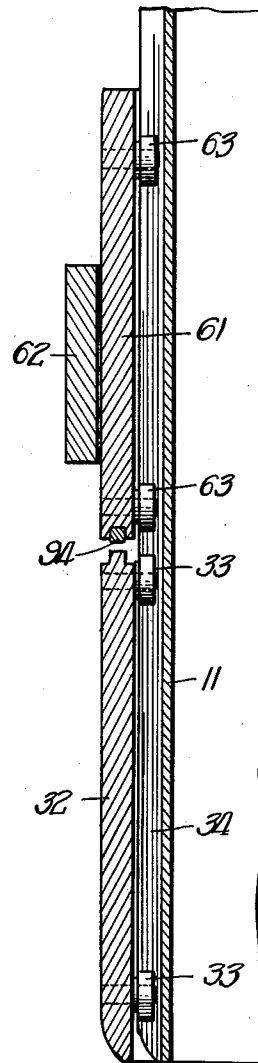


Fig. 11.



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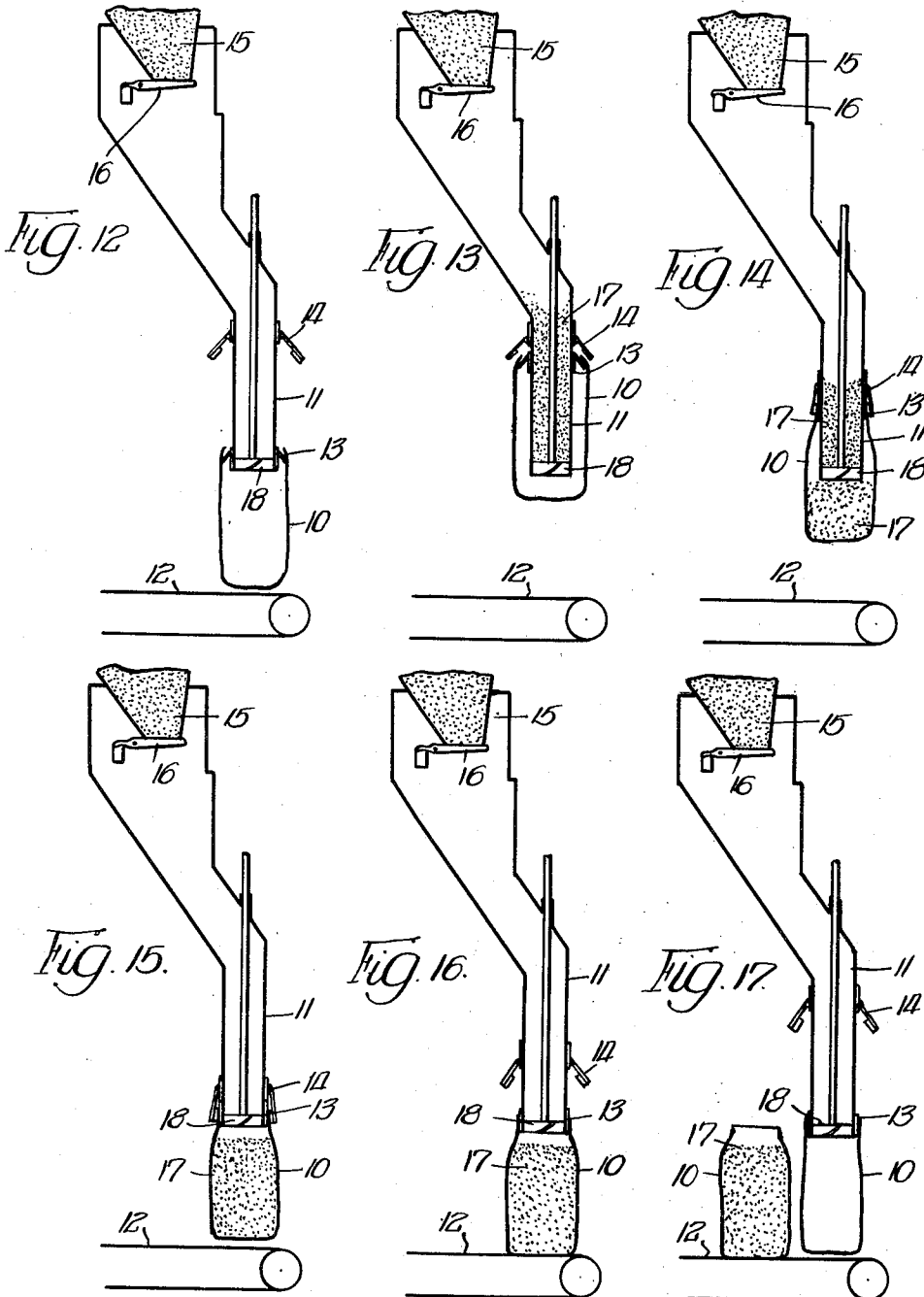
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BAG FILLING TUBE AND ASSOCIATED BAG TOP GRIPPING APPARATUS

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7 Sheets-Sheet 7



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UNITED STATES PATENT OFFICE

2,643,804

BAG FILLING TUBE AND ASSOCIATED BAG
TOP GRIPPING APPARATUS

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Application November 2, 1948, Serial No. 58,006

13 Claims. (Cl. 226—23)

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The present invention relates to improvements in packing apparatus of the type adapted for use in connection with the filling of meal, granular, powdered or other fluent materials into open mouthed bags of cotton, burlap, paper or similar flexible material.

It is a general object of the invention to provide a filling and packing apparatus comprising a packing tube and cooperating pairs of movable gripper members which grip the margins of the bag when the mouth of the empty bag is placed over the packing tube by the operator and automatically hold the bag in proper position while it is being filled and packed with the material and which thereafter deliver the filled bag to a conveyor without the need for any further handling of the bag by the operator.

It is a more specific object of the invention to provide a bag packing tube having supported thereon a pair of relatively movable gripper supporting ring members in combination with suitable automatic operating mechanism for manipulating the grippers and moving the rings relative to each other to grip the margins of the open mouth of a bag and move the bag in telescoped position over the end of the packing tube, to control the movement of the bag during filling of the bag in such a manner as to cause the material to be uniformly packed from the bottom to the top of the bag while the bag is withdrawn from the packing tube and thereafter to release the filled and packed bag onto a conveyor.

It is a further object of the invention to provide a bag packing apparatus of the character described wherein a pair of gripper carrying rings are movably mounted on the packing tube and are automatically operable to internally grip the margins of the bag material adjacent the mouth thereof and move the bag in telescoping relation onto the packing tube, to thereafter clamp the bag margins externally and control the descent of the bag while it is filled uniformly from the bottom to the top and finally to release the filled bag for deposit on a delivery conveyor.

It is a still more specific object of the invention to provide a bag packing apparatus of the class described having a packing tube and a pair of cooperating upper and lower ring members movably mounted thereon, the lower ring member being provided with movable gripper elements for internally gripping the marginal portions of a bag and the upper ring member being provided with movable gripper elements for externally gripping the bag, the gripper elements on the lower ring member being operable to grip the

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bag while the lower ring member moves upwardly into engagement with the upper ring member where the gripper elements thereon are automatically disengaged and the gripper elements on the upper ring member are operated to engage the bag, the ring members being thereafter moved downwardly together while the bag is being filled and then separated after the gripper elements on the upper ring are operated to release the bag for deposit on a discharge conveyor beneath the apparatus.

These and other objects of the invention will be apparent from a consideration of the packing apparatus which is shown by way of illustration in the accompanying drawings, wherein:

Fig. 1 is a side elevation of a packing apparatus incorporating therein the principles of the invention;

Fig. 2 is an end elevation of the packing apparatus;

Fig. 3 is an elevation to an enlarged scale showing the bag top gripping mechanisms on the packing tube in the uppermost position;

Fig. 4 is a transverse section through the packing tube, taken generally on the line 4—4 of Fig. 3;

Fig. 5 is a transverse section through the packing tube, taken generally on the line 5—5 of Fig. 1;

Fig. 6 is an elevation to an enlarged scale of one of the internal bag gripping elements;

Fig. 7 is a sectional view, taken generally on the line 7—7 of Fig. 6;

Fig. 8 is an elevation to an enlarged scale of one of the external bag gripping elements;

Fig. 9 is a sectional view, taken generally on the line indicated at 10—10 of Fig. 8, with the gripper member and associated elements shown partially in elevation and with the gripper member in closed position.

Fig. 10 is a sectional view, taken generally on the line indicated at 10—10 of Fig. 8 but showing the gripping element in open position;

Fig. 11 is a vertical section, taken generally on the line 11—11 of Fig. 4; and

Figs. 12 to 17 are schematic views illustrating the cycle of operations which occur in positioning an empty bag on the packing tube and filling and removing the same.

The apparatus which is disclosed in the drawings incorporates therein the principles of applicant's invention and is particularly adapted to grip the open mouth of a bag, move the bag in telescoped relation over a packing tube, deliver into the bag in a uniformly packed manner a

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fluent material while the bag is withdrawn, simultaneously with the filling operation, from the packing tube and finally to release the filled bag for deposit on a discharge conveyor arranged below the apparatus.

The general arrangement of the mechanisms comprising the apparatus and the sequence of operations may be understood by reference to Figs. 12 to 17 which schematically illustrate the cycle of operations. The bag 10 is positioned by the operator with the open mouth over the end of the packing tube 11, and the machine is then actuated to automatically engage the bag, fill it with a charge of material, and deposit the filled bag on the discharge conveyor 12.

The lower gripping mechanism 13 is first started on its upward movement and its gripper elements are automatically operated to engage the inside of the bag top (Fig. 12). The upper gripping mechanism 14 is retained in its uppermost position and the scale hopper 15 is filled with material ready to deliver a measured charge by operation of the gate 16. While the lower gripping mechanism 13 moves the bag 10 upwardly into telescoping relation over the filling spout 11, the gate 16 is operated to deliver a charge of material 17 which falls by gravity into the packing tube 11 (Fig. 13) in position for delivery into the bag by the packing auger 18. The mouth of the bag 10 is moved into position for engagement by the upper gripping mechanism 14 and the gripping elements on the lower gripping mechanism 13 are automatically moved out of engagement with the bag. The packing auger 18 (Fig. 14) delivers the charge of material 17 into the bag while the bag 10 is moved downwardly with the upper and lower gripping mechanisms 14 and 13, respectively, moving downwardly with the top of the bag. When the packing auger 18 has forced the entire charge of material 17 into the bag 10 the gripping mechanisms 13 and 14 are at their lowermost position with the top of the bag still gripped by the upper gripping mechanism 14 (Fig. 15). The upper gripping mechanism 14 is then operated to release the filled bag 10 and started on its return movement to retracted or initial position at the top of the packing tube 11. The bag 10 with the charge 17 packed therein is allowed to drop onto the top run of the discharge conveyor 12 (Fig. 16). The lower gripping mechanism 13 remains in its lowermost position at the bottom of the packing tube 11 with the bag gripping elements in retracted position. As the filled bag 10 is moved by the conveyor 12 from beneath the packing apparatus the mouth of an empty bag is positioned over the lower gripping mechanism 13 (Fig. 17) and the machine is again operated to repeat the filling cycle.

Referring now to Figs. 1 to 12, the details of the apparatus are shown. The packing tube 11 (Figs. 1 and 2) is cylindrical in form and arranged vertically with the upper portion 19 of the tube extending laterally and upwardly to form a chute beneath the scale hopper 15 which supplies the material for filling the bags. The hopper 15 is provided with a gate 16 which is operated in any conventional manner to permit a predetermined amount or charge 17 of the filling material to fall into the chute forming section 19 of the packing tube 11 and down into the lower end portion thereof where it is delivered to the bag by the packing auger 18. The packing tube 11 and its upper chute forming section 19 may be supported on a conventional frame structure 20

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such as the crossed channel members illustrated.

The frame structure 20 also supports the packing auger 18 and its operating mechanism. The auger 18 is mounted on a vertical shaft 21 which extends through a packing gland 22 in the upper wall of the offset upper section 19 of the packing tube 11. The auger shaft 21 is supported by spaced bearings 23 and is provided at its upper end with a miter gear 24 which engages with a miter gear 25 on the cross shaft 26. The cross shaft 26 is journaled in spaced bearings 27, supported on the frame structure 20 and provided at one end with a pulley 28 which is connected by a belt 29 with the drive pulley on the motor 30. The driving motor 30 is supported on the frame structure 20. The auger shaft 21 is operated continuously by the motor 30 and packs each successive charge of material into a bag 10 while the bag is forced from the packing tube 11 by the packing pressure.

The packing tube 11 supports the cooperating lower and upper gripping mechanisms 13 and 14. The lower gripping mechanism 13 (Figs. 6 and 7) comprises a ring-like band member 32 which surrounds the packing tube 11 and which is guided for vertical movement thereon by circumferentially spaced pairs of vertically spaced guide rollers 33 arranged adjacent the top and bottom edges of the band member 32. The guide rollers 33 (Fig. 11) travel in vertical grooves 34 in the outer surface of the packing tube 11.

The band member 32 forms a carrying frame for the relatively flat, plate-like bottom gripper elements 35, which are pivotally mounted on cross pins 36 journaled in the lower end of the brackets 37. The brackets 37 are circumferentially spaced and extend outwardly and upwardly from adjacent the upper margin of the band member 32. Each bracket 37 comprises two spaced parallel plates 38 and two oppositely disposed brackets 37 are pivotally connected at 39 with the ends 40 of vertically disposed strap members or chains 41. The strap members 41 extend upwardly for connection with a counterweight operating mechanism which will be subsequently described. The band member 32 is suspended in this manner from the straps 41 and is moved vertically relative to the packing tube 11 by movement of the same.

The spaced side plates 38 of each bracket 37 are provided at the lower ends with journals to receive the cross pin 36 on which the gripper plate member 35 is carried. The gripper plate 35 is received in its retracted position within a slotted recess 42 in the band member 32. The lower end of the gripper plate 35 is slotted at 43, forming two leg portions which are provided with outwardly projecting detents 44 or a knurled surface for better engaging the inner margins of the bag 10. At its pivoted end the gripper plate 35 is provided with an integral outwardly projecting arm portion 45 which is slotted at the ends and apertured to form bearings for a cross pin 46. The pin 46 forms a lower cross head on an upwardly extending pull rod 47. The upper end of the pull rod 47 is provided with an enlarged head 48 having a tapered lower shoulder 49 which seats in an apertured socket 50 in a movable hollow plunger member 51. The upper end of the plunger 51 is capped at 52 and adapted to be engaged by a stop pin carried on the upper gripping mechanism 14 which will be subsequently described. The plunger member 51 is provided with an intermediate exterior shoulder 53 which is engaged by one end of a com-

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pression spring 54. The other end of the compression spring 54 is seated on a cross plate 55 extending between the side wall plates 38 of the bracket 37 at an intermediate point. The cross plate 55 is apertured at 56 to provide clearance for a compression spring 57 which extends from the shoulder 53 on the plunger member 51 to a washer 58 secured adjacent the pivot pin 46.

When the movable plunger member 51 is depressed as in Figs. 6 and 7, the spring 57 urges the gripper plate 35 towards its withdrawn position within the recess 42 in the band member 32. When the plunger member 51 is freed it will move upwardly until the external shoulder 53 engages with the apertured guide and stop plate 59 on the bracket 37 and the pull rod 47 will pivot the gripper plate 35 about the pivot pin 36 to the bag top engaging position provided the gripper plate 35 is free to move. The spring 54 is stronger than the spring 47 and when the plunger 51 is free to move upwardly it will move the full distance to bring the external shoulder 53 into engagement with the stop member 59, unless the gripper plate 35 is held against movement or engagement with the bag material and complete outward movement of the same is prevented.

Wedge shaped members 60 are provided on the bottom extremity of the packing chute 11 at the lower ends of the recesses 42 in position to be engaged in latching relation in the slots 43 in the lower ends of gripper plates 35 when the lower gripping mechanism 13 is moved to its lowest position with the gripper plates 35 held in retracted position so that the bag 10 may be placed thereover by the operator at the beginning of the cycle of operations.

The upper gripping mechanism 14 comprises two concentrically arranged inner and outer band or ring members 61 and 62 surrounding the packing tube 11 (Figures 8 to 11). The inner band member 61 is provided with circumferentially spaced pairs of rollers 63 which are received in the guide recesses 34 in the outer surface of the packing tube 11. The outer band member 62 which is larger in diameter than the inner band member 61 is telescoped over and slides on the outer surface of the inner band member 61. It is also narrower or of less depth than the inner band member 61. The inner band member 61 is provided adjacent its lower edge with four pairs of outwardly extending pivot ears 64 which provide supports for pivot pins 65 on which are mounted the external bag gripper members or elements 66. The gripper members 66 extend downwardly from the lower edge of inner band member 61 and are swingable in an outward direction. They are provided at their ends with rubber pads 67 for gripping the external margins of the bag 10 against the surface of the band member 32 on the lower gripping mechanism 13 when the latter is positioned in juxtaposed relation to the upper band member 61 (Fig. 3). Each gripper member 66 is also provided with an abutment shoulder member 68 which is adapted to engage below a cooperating abutment shoulder 69 on the lower band member 32 so that the band member 32 may be locked against vertical movement relative to the upper band member 61 when the gripper members 66 are engaged with the margins of the bag in clamping relation against the lower band member 32 (Fig. 9). A toggle link member 70 is pivotally connected at one end at 71 to the gripper member 66 a short distance below the pivot

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pin 65 and at its other end to a pin 72 journaled between depending spaced bracket members 73 which extend upwardly and inwardly and are secured to the outer band member 62. Movement of the outer band member 62 relative to the inner band member 61 pivots the gripper member 66 toward and from the packing tube 11 by operation of the toggle link 70.

The outer band member 62 is provided on opposite sides with pairs of outwardly projecting ears 74 (Figs. 1 and 2) to which are pivotally connected at 75 the lower ends 76 of the counterweight controlled strap members 41 which control the movement of the band members 61 and 62 in a manner which will be subsequently described. The inner upper band member 61 is provided with circumferentially spaced outwardly extending trunnion forming members 77 (Figs. 8 to 10) which are arranged in vertical alignment above the bracket members 73 on the outer band member 62. Each trunnion member 77 supports a depending arm or link 78 having a roller member 79 journaled in its bifurcated lower end. The upper end of arm 78 is bifurcated and pivotally mounted on a pin 80. The arm 78 is urged in a counterclockwise direction by a torsion spring 81 and functions as a latch for holding the outer band member 62 in its lowermost position relative to the inner band member 61 by engagement with a stop plate 82 secured on the outer band member 62 between the spaced bracket member 73. The roller 79 is adapted to engage the top of the stop plate 82 and hold the band member 62 and its assembly in the lowermost position.

In order to release the gripper members 66 after the bag is filled and when both lower and upper gripping mechanisms 13 and 14 are adjacent the bottom of the filling spout 11, a latch releasing pin 83 is provided in a socket 84 which extends from the outer band member 62 through a small guide plate 85 which is movable in the vertical slot 86 provided in the inner band member 61. The release pin 83 is headed and urged in a radially inward direction by a compression spring 87. The head of the pin 83 is received in a vertical recess 88 in the outer surface of the packing tube 11 during the upward movement of the upper gripping mechanism while the gripper members 66 are not in gripping relation with the bag top. The recess 88 terminates in a cam forming end surface 89 at a spaced distance from the bottom end of the packing tube 11. The cam surface 89 is located to cause the pin 83 to be pressed outwardly at the bottom limit of the movement of the gripping mechanisms to engage the roller 79 and move it from its locking position above the plate 82 to a position where it will ride on the outer surface of the plate 82 and permit the outer band member 62 to move upwardly relative to the inner band member 61. The outer band member 62 is limited in its upward movement relative to the inner band member 61 by circumferentially spaced adjustable stop pins 90 which are carried by the bracket members 77.

The outer band member 62 also carries adjustable stop pins 91 (Figs. 2, 6 and 7) on radially outwardly extending brackets 92 which are adapted to engage the upper ends 52 of the plunger members 51 on the lower gripping mechanism as previously described for retracting the internal gripper plates 35 into the recesses 42 when the lower band member 32 reaches its uppermost position with the bag top margins engaged by the gripper plates 35.

The packing tube 11 is provided with circumferentially spaced abutment forming members 93 (Fig. 10) which limit the upward movement of the upper gripping mechanism 14 by engagement with the outer edges of the outer band member 62.

Rubber bumper members 94 are preferably arranged between the lower band member 32 and the upper band member 61 to cushion the shock of engagement when these members are moved into engagement with each other (Fig. 11).

In the illustrated apparatus the gripping mechanisms 13 and 14 are controlled in their movements by a counterweight 95 (Figs. 1 and 2) which is arranged above the packing tube and which operates with a vertical movement. The counterweight 95 is guided in its movement by a pair of spaced angle members 96, opposing flanges of which engage in slots 97 in the opposite sides of the counterweight 95. At the lower end of the counterweight 95 there is provided a pair of rotatable pulleys 98 which are arranged on opposite sides. A pair of pulleys 99 of similar size is mounted on the frame structure 20 above the packing tube 11 at opposite sides adjacent the guide members 96. A pair of larger supporting pulleys 100 are rotatably mounted in spaced relation adjacent the upper ends of the guide members 96. The straps 41 which are connected at the ends 40 to the lower gripping mechanism 13 extend upwardly and over the pulleys 100, then downwardly and around the pulleys 98, then upwardly and around the pulleys 99 and downwardly to connect at their ends 76 to the upper gripping mechanism 14. By means of this arrangement both the upper and lower gripping mechanisms 13 and 14 are operated by movement of the single counterweight 95.

One of the large supporting pulleys 100 is provided with an inwardly extending pin 101 adapted to be engaged by one arm 102 of a latch member pivoted at 103 to the frame 20 and having a depending arm 104 which is controlled by any convenient actuating means such as an hydraulically operated piston or the like. The counterweight 95 is connected at its lower end to the lower end of a plunger 105 which operates in an air cylinder 106 to provide smooth movement of the counterweight in a well known manner.

The operation of the gripping mechanisms 13 and 14 by means of the counterweight 95 is as follows: Assuming that the lower gripping mechanism 13 is in the lower position and the upper gripping mechanism 14 is in the upper position, the counterweight 95 will be in an intermediate position halfway between its lowermost and uppermost positions with the latch arm 102 engaging the pin 101 on the pulley 100. The mouth of the empty bag 10 is placed over the gripper plates 35 by the operator and the arm 104 is tripped by the starting mechanism to release the latch arm 102 from the pin 101 and permit the counterweight 95 to move downward to its lowermost position. As the counterweight 95 begins its downward movement the lower gripping mechanism 13 begins to move upwardly and the gripper plates 35 are released from engagement with the wedge members 60 and pivot outwardly into gripping engagement with the internal margins of the bag 10. Continued movement of the counterweight 95 carries the lower gripping mechanisms 13 upwardly by movement of the straps 41 until the upper edge of the lower band member 32 engages the inner band member 61 and moves the band member 61 up relative to the outer band member 62, the outer band mem-

ber being held against upward movement by the abutment members or stops 93. This movement causes the toggle links 70 to swing the gripper members 66 against the band member 32 and externally grip the outer margins of the bag 10 in clamping relation against the band member 32 while the internal gripper plates 35 on the lower band member 32 are moved by the springs 57 into retracted position in the recesses 42 as the outer upper band member 62 engages the abutments 93 and the pressure of the stop pins 91 depresses the members 51. The gripper members 66 are held in clamping position by the rollers 79 on the latch arms 78 while the pressure of the material, as it is fed into the bag 10 by the auger 18, moves the bag downwardly and carries with it both lower and upper gripping mechanisms 13 and 14, causing the counterweight to move upwardly to its uppermost position. When the bag is completely filled and the gripping mechanisms 13 and 14 reach their lowermost position, the pins 83 are moved outwardly by the cam surfaces 89 in the slots 88 and the rollers 79 are moved out of latching engagement with the top of plates 82, permitting the band member 62 to move upwardly relative to the band members 61 and swinging the external gripper members 66 outwardly about the pivots 65 to release the filled bag and also to disengage the abutments 68 and 69 and free the upper gripping mechanism 14 for movement in the upward direction. The counterweight 95 automatically begins to drop when the external gripper members 66 release the filled bag 10 and the upper gripping mechanism 14 moves upwardly until it reaches its uppermost position when the latch arm 102 automatically operates to engage the pin 101 and stop the counterweight in the intermediate position where it is ready for the next cycle of movement. The gripper plates 35 on the lower gripping mechanism 13 are held in the recesses 42 by action of the springs 54 and 57 during the downward movement of the gripping mechanisms while the bag 10 is being filled, and when the lower limit of movement is reached the gripper plates 35 are held against outward movement by engagement with the wedge members 60 until the next cycle of operations starts the lower gripping mechanism on its upward movement.

It will be understood that the use of other mechanisms for operating the gripping devices is contemplated. While the counterweight arrangement in the illustrated apparatus provides satisfactory operation, it may be desirable to operate the gripping mechanisms hydraulically or electrically. Any suitable control may be employed to actuate the filling material delivery gate 16. Also the control for starting the movement of the counterweight 95 may be varied considerably and the particular mechanism shown for this purpose is merely illustrative.

While specific details of construction have been shown in the illustrated apparatus, it will be understood that other details of construction of an equivalent nature are contemplated within the spirit of the invention.

We claim:

1. In a bag filling apparatus wherein an empty bag is positioned on a filling spout and then withdrawn therefrom as the filling material is forced into the bag, mechanism for gripping the bag margins adjacent the mouth thereof and controlling the movement of the bag, said mechanism comprising a pair of spout encircling frame members, said frame members comprising upper and

lower members which are initially separated, means mounting said frame members for axial movement on said spout, movable bag grippers mounted on said frame members, and means for moving said bag grippers and said frame members in timed relation, said means for moving said frame members comprising a movable counterweight, means connecting the counterweight with said upper and lower frame members whereby predetermined movement of the counterweight moves said upper and lower frame members relative to each other, and control means for said counterweight, whereby to position the mouth of an empty bag over the spout, thereafter to retard the movement of the bag as it is forced from the spout by the filling operation and finally to automatically release the filled bag.

2. A bag packing apparatus comprising a packing tube, a pair of upper and lower ring members, means supporting said ring members on said tube for axial movement relative to said tube and to each other, movable gripper elements on said lower ring member for internally gripping the marginal portions of a bag, movable gripper elements on said upper ring member for externally gripping the marginal portions of the bag, means for operating the gripper elements on said lower ring member to grip the bag when it is positioned thereon, means for moving said lower ring member upwardly toward said upper ring member to telescope the bag over the tube, means for operating the gripper elements on said upper ring member to grip the bag when said lower ring member moves into engagement with said upper ring member, means for automatically disengaging the gripper elements on said lower ring member when said lower ring member moves into engagement with said upper ring member, means in said tube for forcing a charge of filling material into the bag and thereby forcing the bag downwardly on said tube, means for retarding the movement of said ring members as they are simultaneously forced downwardly by downward movement of the bag during the filling operation, means for operating the gripper elements on said upper ring member to release the bag when the filling operation is completed, and means for returning said upper ring member to its uppermost position on said tube.

3. A bag packing apparatus as recited in claim 2 and interengaging means for locking said upper and lower ring members together when said lower ring member moves into engagement with said upper ring member, said locking means being disengaged when the filling operation is completed.

4. Packing apparatus comprising in combination, a vertical filling spout to receive the open mouth of a flexible bag and means for freely suspending the bag by its mouth while it is being filled with material, said means comprising a pair of relatively movable upper and lower circular frame members positioned around said spout, gripper members on the lower one of said frame members adapted for engaging the internal margins of the bag, gripper members pivotally mounted on the upper one of said frame members adapted for engaging the external margins of the bag to clamp the same against the lower frame member, an outer ring mounted for limited axial movement on said upper frame member, an operating link connecting each of said pivotally mounted gripper members with said outer ring member, means on said spout engageable with said outer ring member to limit the upward move-

ment of the same, and means to move said lower frame member upwardly into engagement with said upper frame member and thereby move said pivotally mounted gripper members into bag clamping engagement with the lower frame member.

5. Packing apparatus comprising a vertical filling spout for receiving in telescoping relation thereover a flexible bag to be filled with material, upper and lower frame members mounted on said spout for predetermined vertical movement, cooperating guide means on said spout and said frame members, said lower frame members being initially positioned adjacent the bottom end of said spout, said upper frame member being initially positioned adjacent the upper end of said spout, bag gripper arms mounted on said frame members, the gripper arms on the upper frame member being pivoted adjacent the lower edge of said frame member, an outer ring member mounted on said upper frame member for limited vertical movement relative thereto, means mounted on said spout for limiting the upward movement of said outer ring member while permitting further upward movement of said upper frame member, links pivotally connecting the gripper arms on the upper frame member with said outer ring member, and operating means to move said lower frame member vertically into engagement with said upper frame member and thereafter to move said upper frame member relative to said outer ring member to cause said links to pivot the gripper arms on said upper frame member into clamping engagement with said lower frame member.

6. Packing apparatus as recited in claim 5 and means for automatically latching said outer ring member to said upper frame member upon predetermined upward movement of the latter.

7. Packing apparatus as recited in claim 6 and means for automatically releasing said latch means upon predetermined downward movement of said upper frame member on said spout.

8. In a bag filling apparatus wherein an empty bag is positioned on a filling spout and then withdrawn therefrom as the filling material is forced into the bag, mechanism for gripping the bag margins adjacent the mouth thereof and controlling the movement of the bag, said mechanism comprising a pair of spout encircling frame members, means mounting said frame members for relative movement axially of said spout, said mounting means for said frame members comprising circumferentially spaced, radially inwardly projecting guide rollers and said filling spout being provided with cooperating axially extending grooves for receiving said guide rollers, movable bag grippers mounted on said frame members, and means for moving said bag grippers and said frame members in timed relation whereby to position the mouth of an empty bag over the spout, thereafter to retard the movement of the bag as it is forced from the spout by the filling operation and finally to automatically release the filled bag.

9. In a bag filling apparatus wherein an empty bag is positioned on a filling spout and then withdrawn therefrom as the filling material is forced into the bag, mechanism for gripping the bag margins adjacent the mouth thereof and controlling the movement of the bag, said mechanism comprising a pair of spout encircling frame members, means mounting said frame members for relative movement axially of said spout, movable bag grippers mounted on said frame mem-

bers, and means for moving said bag grippers and said frame members, in timed relation whereby to position the mouth of an empty bag over the spout, thereafter to retard the movement of the bag as it is forced from the spout by the filling operation and finally to automatically release the filled bag, said frame members comprising upper and lower band members which are initially separated and wherein said movable bag grippers comprise bag engaging arm members pivotally mounted on the lower band member for automatic outward swinging movement to engage the inner margins of the empty bag upon upward movement of said lower band member, and means mounted on said upper band member to automatically pivot said bag gripper members on said lower band member out of engagement with the bag when said lower band member moves upwardly into engagement with said upper band.

10. In a bag filling apparatus wherein an empty bag is positioned on a filling spout and then withdrawn therefrom as the filling material is forced into the bag, mechanism for gripping the bag margins adjacent the mouth thereof and controlling the movement of the bag, said mechanism comprising a pair of spout encircling frame members, means mounting said frame members for relative movement axially of said spout, movable bag grippers mounted on said frame members, and means for moving said bag grippers and said frame members in timed relation whereby to position the mouth of an empty bag over the spout, thereafter to retard the movement of the bag as it is forced from the spout by the filling operation and finally to automatically release the filled bag, said frame members comprising upper and lower band members which are initially separated and wherein said movable bag grippers comprise bag engaging arm members pivotally mounted on said upper band member for automatic inward swinging movement to engage the outer margins of the empty bag upon upward movement of said lower band member to a position in engagement with said upper band member, and wherein interengaging means are provided on said bag engaging arm members and said lower band member to lock said upper and lower band members together for simultaneous downward movement with the bag as the bag is forced from the spout by the filling operation.

11. In a bag filling apparatus as recited in claim 1 wherein said movable bag grippers comprise bag engaging arm members, means for pivotally mounting said arm members on the lower band member, and means for automatically swinging said arm members outwardly to engage

the same with the inner margins of the empty bag upon upward movement of said lower band member.

12. In a bag filling apparatus as recited in claim 1 wherein said movable bag grippers comprise bag engaging arm members, means for pivotally mounting said arm members on said upper band member, and means for automatically swinging said arm members outwardly to engage the same with the outer margins of the empty bag upon upward movement of said lower band member to a position in engagement with said upper band member.

13. In a bag packing apparatus comprising a packing tube and upper and lower band members mounted in encircling relation to said tube for movement relative thereto, bag engaging gripper devices on said lower band member each comprising a bag engaging plate member, a pair of spaced bracket members extending outwardly of said lower band member, pivot means mounting the upper end of said plate member at the lower end of said bracket members, an arm on the upper end of said plate member extending outwardly of said pivot means, an upwardly extending pull rod pivotally connected to the outer end of said arm, a member slidably mounted in said bracket members for limited vertical movement, said member being movably connected to the upper end of said pull rod, compression spring means between said arm on said plate member and said slidably mounted member, compression spring means between said slidably mounted member and said bracket members urging said slidably mounted member and said pull rod in an upward direction to pivot said bag engaging plate member outwardly of said lower band member, and an abutment on said upper band member for engagement with said slidably mounted member when said upper and lower band members are moved into juxtaposed relation whereby to cause said compression spring between said arm and said slidably mounted member to swing said bag engaging plate member toward said lower band member.

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