Nov. 18, 1930. H. ANDERSON 1,781,714

BAG SHAKER AND FEEDER

Filed April 21, 1930 6 Sheets-Sheet 1

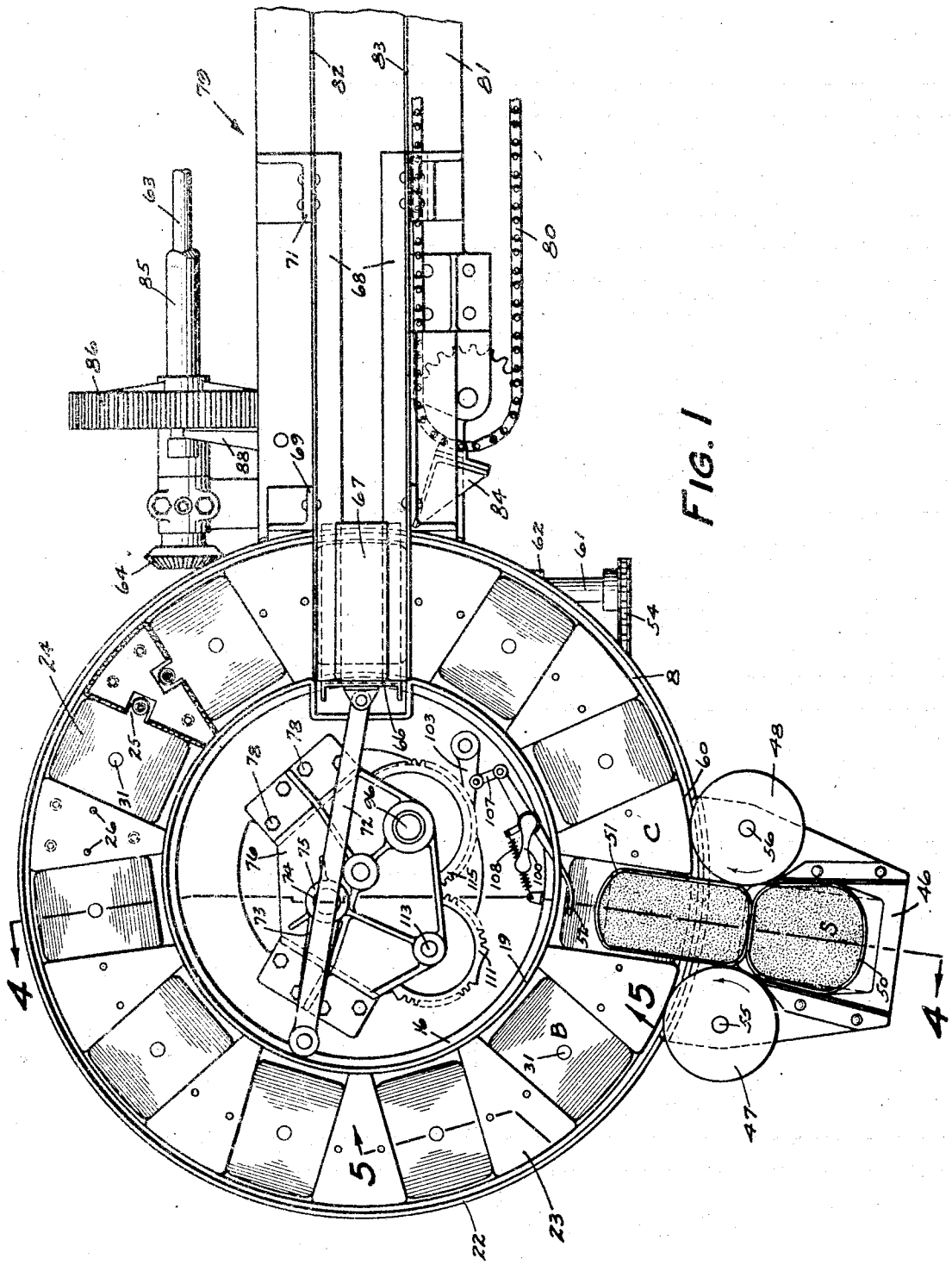


FIG. 1

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BAG SHAKER AND FEEDER

Filed April 21, 1930 6 Sheets-Sheet 2

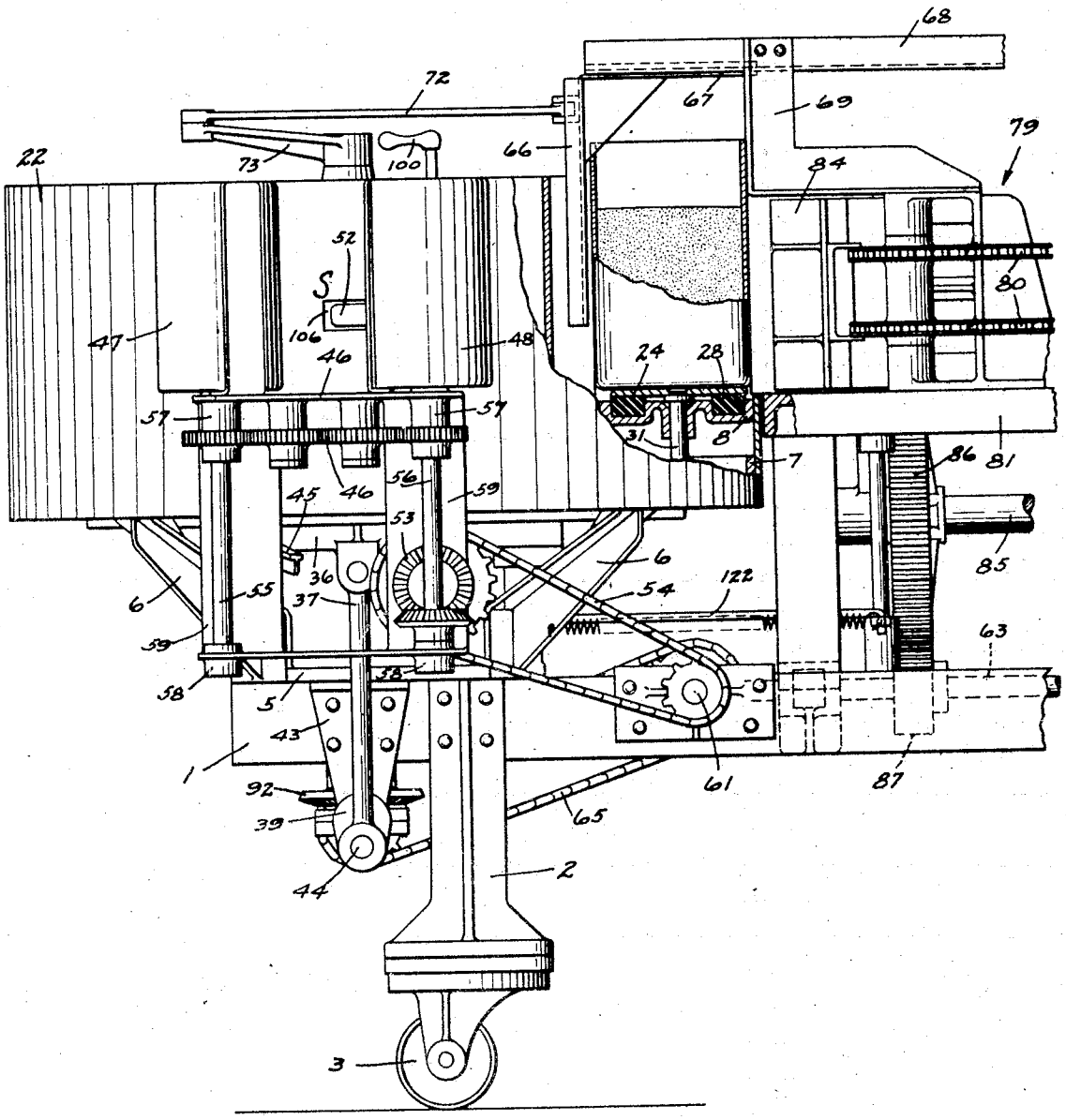


FIG. 2

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BAG SHAKER AND FEEDER

Filed April 21, 1930 6 Sheets-Sheet 3

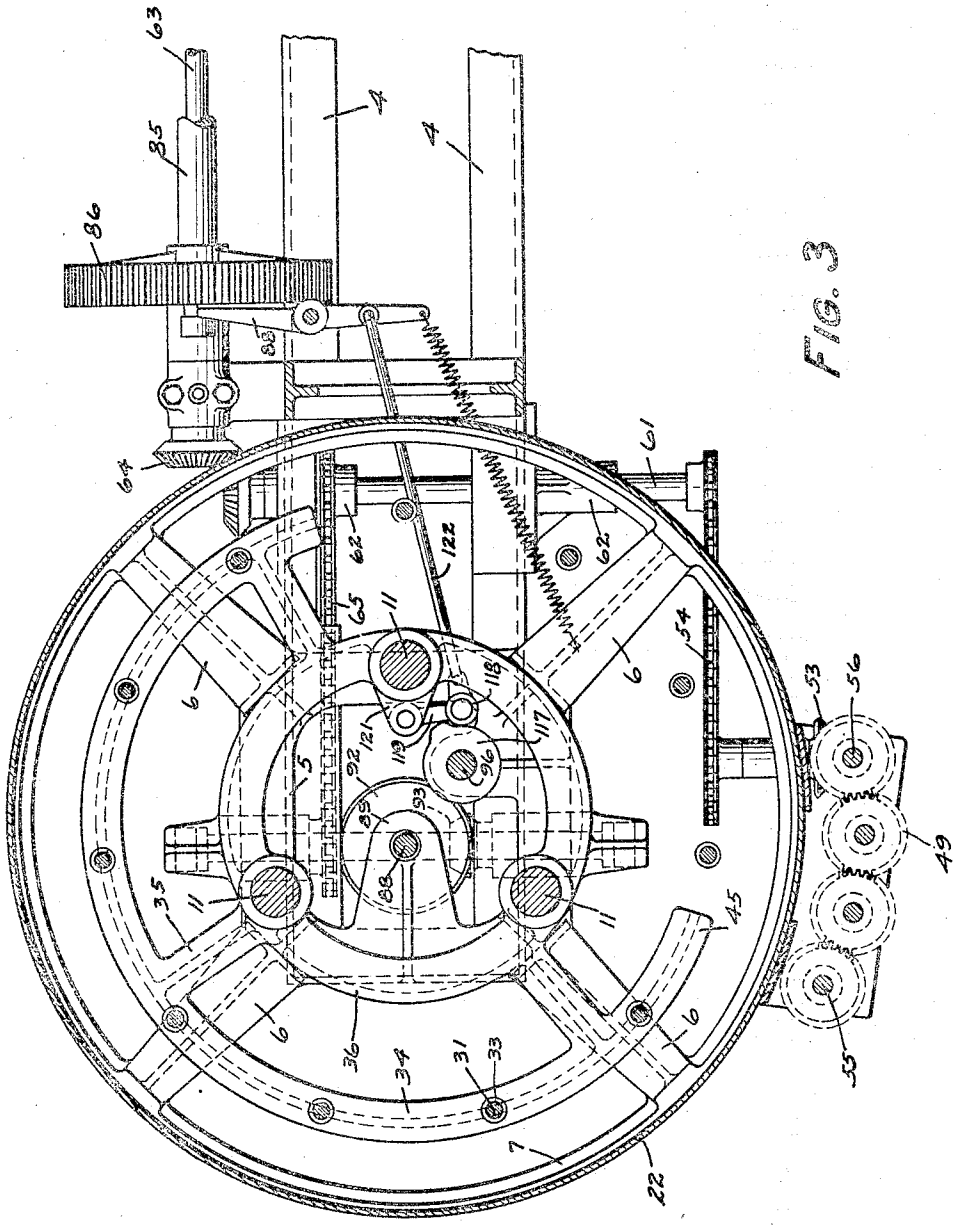


FIG. 3

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BAG SHAKER AND FEEDER

Filed April 21, 1930 6 Sheets-Sheet 4

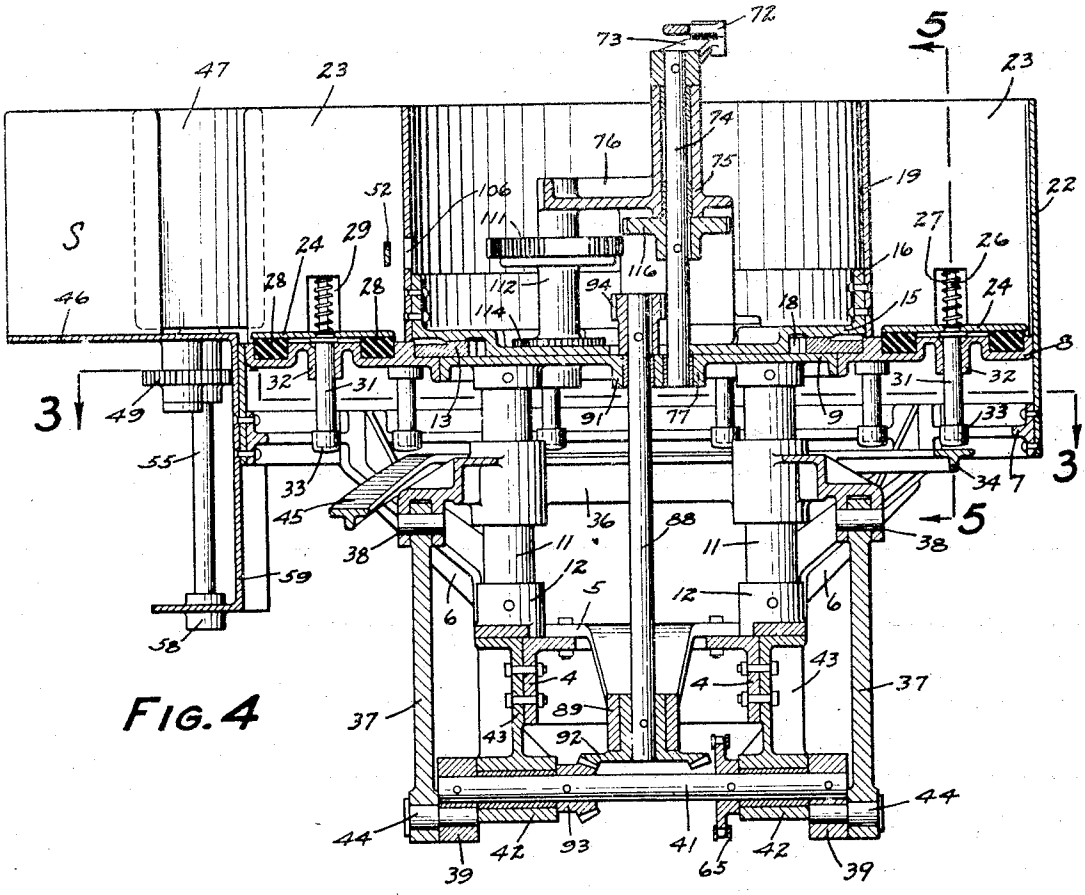


FIG. 4

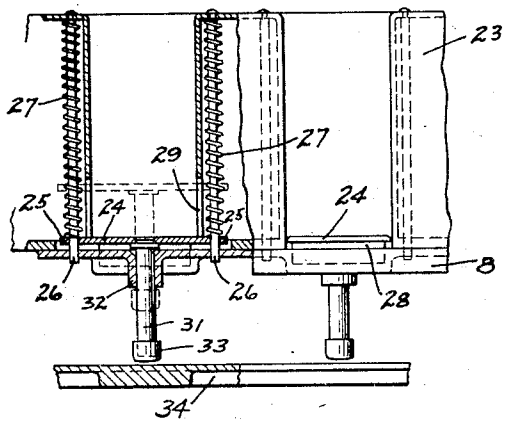


FIG. 5

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Nov. 18, 1930. H. ANDERSON 1,781,714

BAG SHAKER AND FEEDER

Filed April 21, 1930 6 Sheets-Sheet 5

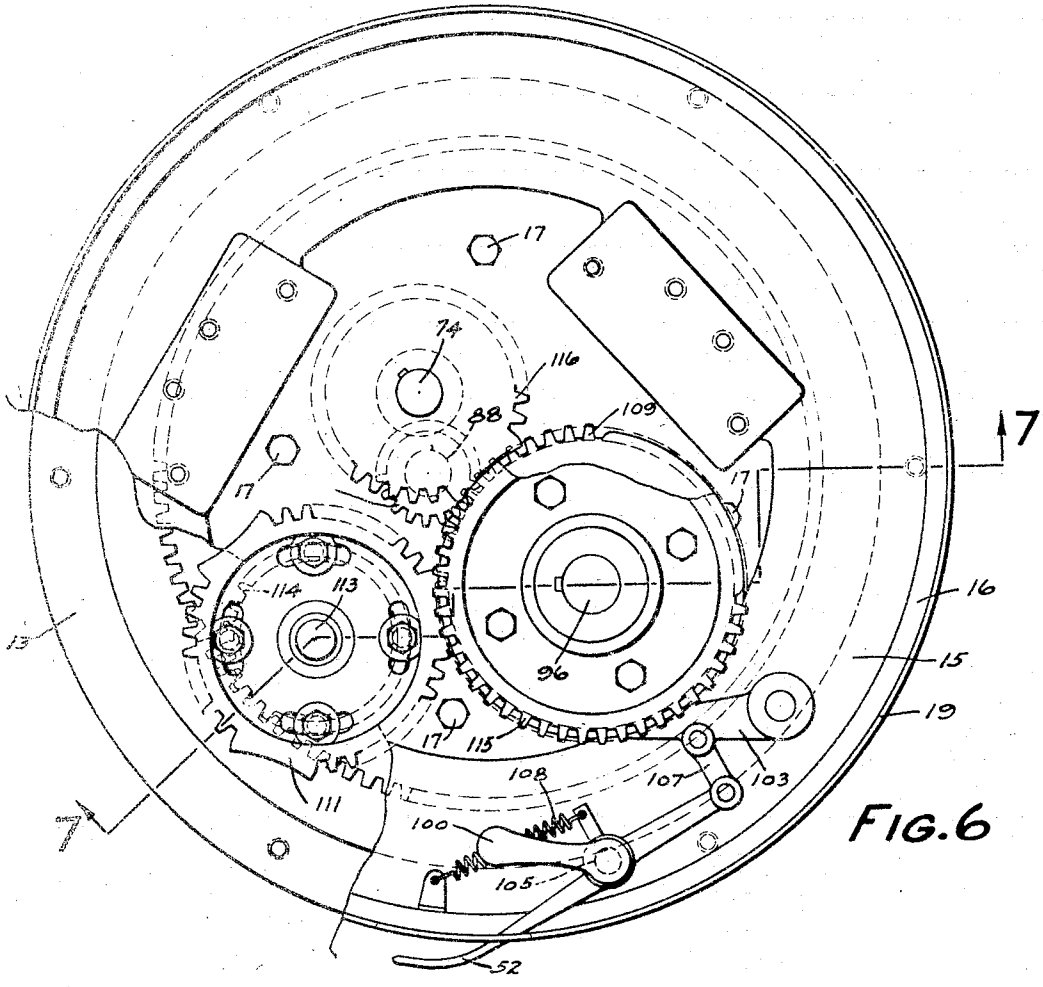


FIG. 6

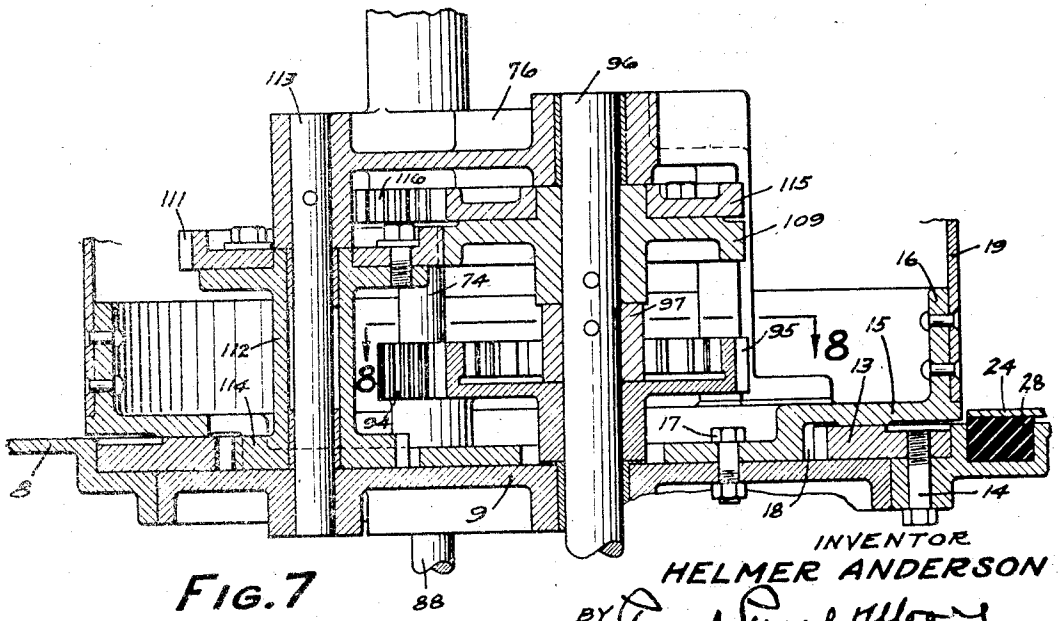


FIG. 7

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Nov. 18, 1930. H. ANDERSON 1,781,714

BAG SHAKER AND FEEDER

Filed April 21, 1930 6 Sheets-Sheet 6

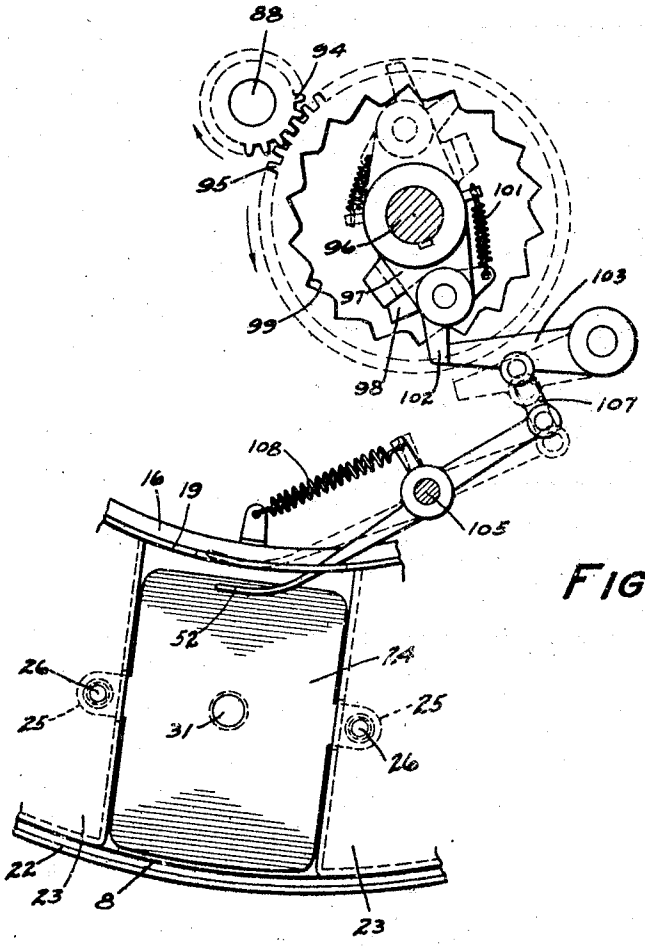


FIG. 8

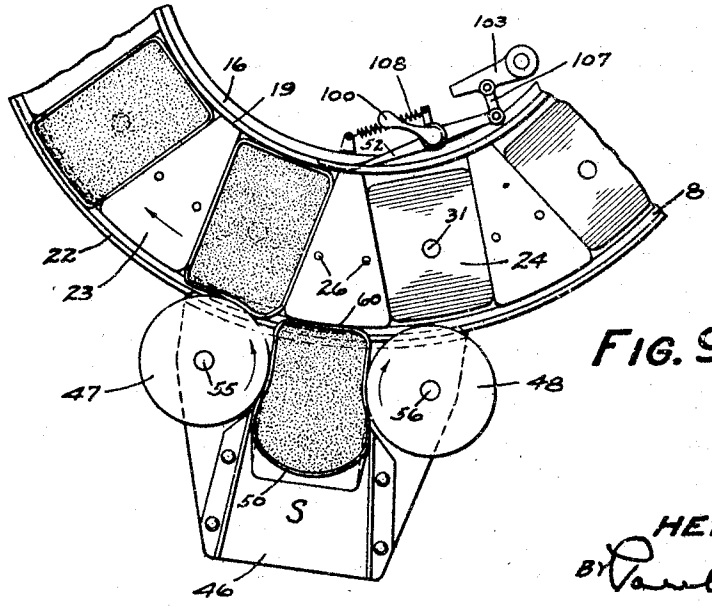


FIG. 9

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Patented Nov. 18, 1930 1,781,714

UNITED STATES PATENT OFFICE

HELMER ANDERSON, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO GENERAL MILLS, INC., OF MINNEAPOLIS, MINNESOTA, A CORPORATION OF DELAWARE

BAG SHAKER AND FEEDER

Application filed April 21, 1930. Serial No. 445,954.

This invention relates to an improved apparatus for shaking down or settling finely divided substances such as flour, in bags or other receptacles, and to simultaneously feed the filled bags to a suitable receiving means.

An object of the invention is to provide a bag shaker and feeder comprising a rotary table provided with a plurality of open compartments each adapted to receive a filled bag or receptacle, and provided with means for shaking or vibrating the table to the extent that the material contained in the bags supported thereon will settle downwardly therein, and means being provided to eject the bags from said compartments onto a suitable receiving means.

A further object is to provide an apparatus of the class described including means for shaping each bag as it is delivered into a compartment, after which the walls of the compartment will retain the bag walls in proper shape as the bag is being vibrated to settle the material therein, whereby the bag, when ejected from the machine with the material settled firmly therein will retain its shape.

Other objects of the invention reside in the arrangement of the feed rollers which feed the filled bags into the compartments provided on the rotary table and shape the walls of the bag; in the construction of the bottoms of the compartments upon which the filled bags are supported; in the means for actuating said bottoms to cause them to impart a shaking or vibrating motion to the bags; in the means for intermittently rotating the table, the operation of which is controlled by the actuation of a trip arranged to be engaged by each filled bag delivered onto the table; in the means for ejecting the bags from the rotary table; and, in the general construction of the apparatus as a whole.

Other objects of the invention will appear from the following description and accompanying drawings and will be pointed out in the annexed claims.

In the accompanying drawings, there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown as various changes may be made within the scope of the claims which follow.

In the drawings:

Figure 1 is a plan view of the apparatus showing the parts in normal position;

Figure 2 is a side elevation of Figure 1 partially broken away to show the means for ejecting the bags from the rotary table;

Figure 3 is a sectional plan view on the line 3—3 of Figure 4, illustrating the means for shaking or vibrating the bags;

Figure 4 is a vertical sectional view on the line 4—4 of Figure 1, illustrating a portion of the operating mechanism and also the construction of the movable bottoms of the compartments;

Figure 5 is a detail sectional view on the line 5—5 of Figures 1 and 4, showing the tension means which constantly urge the compartment bottoms downwardly against the rubber cushions;

Figure 6 is an enlarged detail view partially broken away showing the intermittent gear drives;

Figure 7 is a detail sectional view on the line 7—7 of Figure 6, illustrating the operating mechanism;

Figure 8 is a fragmentary sectional view on the line 8—8 of Figure 7, showing the trip positioned to be actuated by each bag delivered onto the rotary table to cause the table to be rotated one step; and

Figure 9 is a detail view illustrating the positions of the bags during rotation of the table.

General

Paper bags, when filled with flour or other finely divided material by an ordinary bag-filling machine, should be subjected to a vibratory or shaking motion to cause the material therein to settle down before the bag is subsequently closed and sealed. It is the purpose of this invention to provide a machine for thus vibrating or shaking the bags after having been filled, whereby the flour will be settled firmly therein before the bags are closed and sealed. The present machine is applicable for use in connection with such machines as the bag closing machine disclosed in my pending application, Serial No.

378,376, filed July 15, 1929, and, when used in connection therewith, provides means for settling the material in the bags and simultaneously feeding the filled bags from a given point to the bag closing machine.

Frame

The novel apparatus herein disclosed comprises a suitable supporting frame 1 here shown mounted upon a standard 2 which may be provided with a suitable castor 3 for the convenience of moving the machine about from place to place. The supporting frame 2 is shown comprising spaced apart beams 4—4, as illustrated in Figure 3, which may also constitute the supporting frame for a bag closing machine, a portion of which is indicated in Figures 1, 2, and 3.

A suitable bracket 5 is secured to the supporting beams 4—4 and is provided with radial arms 6, here shown having an annulus or ring 7 integrally formed therewith. The bracket 5, as hereinbefore stated, is seated upon and secured to the beams 4—4 and the arms 6 extend upwardly therefrom, as shown in Figure 2 to support the annular ring 7 at a higher elevation.

Rotary table

The table is adapted for intermittent rotary movement and comprises a circular member 8 having an enlarged central bore adapted to receive a plate 9 which is fixedly mounted upon the upper ends of a plurality of upright posts 11, having their lower terminals secured in hubs 12 preferably integrally formed with the bracket 5, as best shown in Figure 4. A suitable ring gear 13 is secured to the member 8 as by bolts 14, shown in the lower right hand corner of Figure 7. The ring gear 13 overhangs the bore in the member 8 and engages the upper marginal portion of the plate 9, whereby the latter will provide a support for the table member 8, as will readily be understood by reference to Figure 4. A casting 15, having an upstanding annular flange 16, is suitably secured to the plate 9 by such means as bolts 17, shown in Figure 7. An annular recess 18 is provided in the lower face of the casting 15 adapted to receive the ring gear 13, as shown in Figures 4 and 7. An inner cylindrical wall 19 is secured in fixed relation to the flange 16 of the casting 15 and extends upwardly, as shown in Figure 4. An outer cylndrical wall 22 is secured to the annulus 7 supported by the arms 6 of the bracket 5, and has its upper edge terminating substantially in the plane of the upper edge of the wall 19, as best shown in Figure 4.

Members 23 are secured to the circular table member 8 in spaced relation, as shown in Figure 1, and the adjacent side walls of the adjacent members 23 are arranged in substantially parallel relation and cooperate with portions of the inner and outer cylindrical walls 19 and 22, to provide a series of spaced apart compartments, each adapted to receive a filled bag.

The bottom of each compartment consists of a movable plate 24, preferably having oppositely extending ears 25 slidably engaged with guide rods 26 supported in the adjacent edge portions of the members 23, as best shown in Figure 5. Suitable springs 27 are coiled about the guide rods 26 and have their lower ends engaged with the ears 25 of the plates 24, whereby a downward pressure is constantly exerted upon the plates 24 to hold them in the position shown in Figures 4 and 5. Resilient elements 28 such, for example, as rubber, are seated in depressions provided in the table member 8 and are adapted to support the plates 24 when in normal or lowermost positions, as shown in Figure 4. Suitable clearance apertures 29 are provided in the side walls of the members 23 to provide clearance for the ears 25 of the movable plates 24. Each movable bottom 24 is provided with a depending rod 31, slidably received in hubs 32 provided on the member 8, and each such rod 31 is preferably provided at its lower end with a cap 33, as shown in Figure 4.

Table vibrating mechanism

The means for imparting a vibratory or shaking motion to the table is here shown as consisting of a curved track 34 supported by a plurality of arms 35, preferably integrally formed with a circular frame 36 slidably supported upon the upright posts 11, as best shown in Figures 3 and 4. Pitmen 37 have their upper ends pivotally connected to the frame 36 as indicated at 38 in Figure 4, and their lower ends operatively connected with cranks 39 suitably secured to a horizontal shaft 41 mounted in suitable bearings 42 provided in hangers 43 secured to the frame members 22 as will be understood by reference to Figure 4. When the shaft 41 is rotated, an up-and-down motion will be imparted to the circular frame 36 which, in turn, will cause the curved track 34 to be similarly actuated with the result that the track will engage the lower ends or caps 33 of the movable bottoms 24 of the compartments, and impart thereto a vibratory or shaking motion.

Before the crank pins 44 reach the bottoms of their strokes, the movable bottoms 24 will engage the resilient elements 28, causing a jarring motion to be imparted to the filled bags which will cause the material therein to settle down into the bags. The leading end portion 45 of the curved track 34 is shaped as shown in Figure 4, and slopes downwardly sufficiently to cause the lower ends of the rods 33 to engage the inclined upper face thereof, whereby the rods will ride upwardly over said face

onto the horizontally disposed upper surface of the track.

Table loading mechanism

The means for successively feeding the filled bags into the compartments provided on the table is best shown in Figures 1 and 4, and comprises a loading station S including a small platform 46 whereon the filled bags are placed as shown in Figure 1. The bags may be delivered to the station S from a suitable bag filling and weighing machine, not shown in the drawings.

When paper bags are filled with flour or other finely divided material by an ordinary bag filling machine, the bodies thereof usually become distorted so that they are more or less rounded in cross-section because of the fact that such machines are not provided with means for retaining the bag walls in proper shape during the filling operation. It is a feature of this invention, in addition to the features of shaking and feeding the bags, to shape the bodies of the filled bags so that when the latter are delivered to a bag closing machine, or other station, to have their tops closed and sealed, the walls of the bag will be properly shaped whereby the bag when sealed, will present a neat appearance and all bags will be alike in size and shape.

The means provided for thus shaping the bag walls is shown in Figures 1 and 9, and consists of a pair of upright feed rollers 47 and 48 operatively connected together by a train of gears 49 as shown in Figure 3, whereby the feed rollers will rotate in opposite directions. These rollers are located at the loading station S. The shortest distance between the peripheries of the two feed rollers is substantially less than the width of the bag 50, shown positioned upon the platform 46 at the loading station S. It therefore follows that when the bag 50 is fed by the rollers 47 and 48 into the compartment alined therewith, the side walls of the bag will be pressed together so that the bag will readily enter the compartment, it being noted that the distance between the peripheries of the rollers is also less than the widths of the pockets. 51 indicates a bag partially fed into a compartment of the feed rollers. When the bag 50 is fed between the rollers 47 and 48, it will engage the adjacent end of the bag 51 and move the latter into the compartment, until the leading end thereof engages and actuates a trip lever 52 which will cause the operating mechanism, which will subsequently be described, to commence to function, and rotate the table one step, or until the next following compartment moves into bag receiving position in alinement with the two feed rollers.

The peripheral speed of the feed rollers is substantially equal to the peripheral speed of the outer portions of the compartments so that as the bag 51, positioned in the compartment alined with the feed rollers, is fed from the position shown in Figure 1 to the next succeeding position indicated at B in Figure 1, the projecting end wall of the bag will be pressed inwardly by the periphery of the feed roller 47, as shown in Figure 9, whereupon the bag walls will be shaped to conform to the walls of the compartments, defined by the spaced parallel walls of the members 23 and the inner and outer cylindrical walls 19 and 22, in which position the walls of the bags will be retained until the bags are successively ejected from the compartments. The means for thus shaping the walls of the bag forms an important part of this invention as it assures each bag as it is being vibrated to settle the contents therein, will be delivered onto the receiving means with its walls properly shaped.

During rotation of the table from one step to the next, the curved outer surface 60 of the member 23 temporarily interrupted at C, will engage the leading end of the bag 50 and temporarily interrupt its movement until the next following compartment moves into alinement with the feed rollers 47 and 48, whereupon the latter will feed the bag 50 into the alined compartment, as hereinbefore stated. Figure 9 illustrates the positions of two bags during rotation of the table. It is to be understood that the feed rollers are provided with smooth peripheries so that they will not tear the walls of the bag which is temporarily held therebetween during rotation of the table from one step to the next.

Feed roller operating means

The means for operating the feed rollers 47 and 48 is best shown in Figures 2, 3, and 4, and comprises a bevel gear drive 53 adapted to be operated by a chain-and-sprocket drive 54, as shown in Figures 2 and 3. The feed rollers 47 and 48 are provided with shafts 55 and 56, respectively, having intermediate portions supported in suitable bearings 57 provided on the platform 46 of the loading station S. The lower portions of these shafts are rotatably mounted in bearings 58 supported upon the depending portion 59 of the platform 46. As here shown, the bevel gear drive 53 operatively connects the roller shaft 56 with the drive chain 54. This chain is operated from a cross shaft 61 mounted in suitable bearings 62, preferably secured to the side frame members 2—2. The cross shaft 61 is driven from a main operating shaft 63 by a suitable gear drive 64. The main drive shaft 63 may also function as a drive shaft for a bag closing machine, not shown in the drawings. The main drive shaft 63, the cross shaft 61, and the train of gears 49 are adapted for constant rotation.

A chain-and-sprocket drive 65 connects the crank shaft 41 with the cross shaft 61,

thereby causing the circular track 34 to operate continuously when the feed rollers are rotating.

Ejector

A means for ejecting the bags from the compartments is shown in Figures 1 and 2, and comprises an upright pusher plate 66 having a horizontally disposed portion 67 slidably supported upon spaced apart rails 68 supported by upright frame members 69 and 71. The plate 66 is actuated by a connecting rod 72 operatively connected with a crank arm 73 secured to the upper end of a shaft 74 mounted in a suitable bearing 75 provided in a bracket 76 and a lower bearing 77 provided in the plate 9. The bracket 76 is suitably secured to the casting 15 by such means as bolts 78, shown in Figure 1.

The pusher plate 66 operates to discharge the bags from the compartments and deliver them onto a suitable receiving means such, for example, as the receiving table or conveyer of a bag closing machine 79, a portion of which is diagrammatically illustrated in Figures 1, 2, and 3. As here shown, a fixed table 81 is provided with upright side walls 82 and 83, between which a series of conveyer flights 84 travel and feed the bags along the table 81 to the bag top closing mechanism, not shown in this application. The flights are operated by a conveyer chain 80. An operating shaft 85 is shown mounted directly above the main drive shaft 63 and has a suitable clutch gear wheel 86 loosely mounted thereon. The gear 86 meshes with a pinion 87 secured to the drive shaft 63, as indicated in Figure 2, whereby the gear 86 will rotate constantly with the pinion 87. A suitable clutch mechanism, not shown in the drawings, is provided within the gear wheel 86 and is adapted to be actuated by an arm 88 to cause the gear to become locked to the operating shaft 85, whereupon said shaft will rotate synchronously with the gear 86. The shaft 85 is, of course, operatively connected with the conveyer chain 80 so that when the shaft 85 is rotated, the conveyer chain 80 will also operate. As the receiving means (bag closing machine) above described, forms no part of the present invention, it is unnecessary to describe the same in detail.

Main operating mechanism

The means provided for controlling the intermittent or step-by-step movement of the table is best shown in Figures 4, 6, and 7. A vertical shaft 88 is mounted in bearings 89 and 91 provided respectively in the bracket 5 and the plate 9. This shaft has a bevel gear 92 secured to the lower end thereof which meshes with a pinion 93 secured to the horizontal shaft 41. The shaft 88 therefore operates continuously with the shaft 41, the latter being connected by the chain drive 65 to the cross shaft 61 which, in turn, is connected by the bevel gears 64 to the main drive shaft 63.

A pinion 94 is secured to the upper end of the shaft 88 and meshes with a gear wheel 95 loosely mounted upon a shaft 96 mounted in suitable bearings provided in the bracket 76 and the plate 9, as shown in Figure 7. A crank arm 97 is keyed to the shaft 96 directly above the hub of the gear 95 and carries a dog 98 adapted to be moved into engagement with an internal ratchet 99 provided in the gear 95. A suitable spring 101 connects the dog 98 with the crank arm 97 and constantly tends to move the dog into driving engagement with the ratchet 99, as will be noted by reference to Figure 8. A detent 102 is provided upon the dog 98 and is positioned to be engaged by an abutment lever 103 pivotally mounted upon the casting 15, as best shown in Figures 1 and 6. The trip lever 52 is also pivoted to the casting 15, as indicated at 105 in Figure 8, and has one end projecting through an aperture 106 provided in the cylindrical wall 19 in alinement with the two feed rollers 47 and 48, and so that the trip lever may be engaged by a bag fed into the compartment alined with the feed rollers, as will be understood by reference to Figure 1. The opposite end of the trip lever 52 is connected by a link 107 to the abutment lever 103, so that when a bag engages the opposite end portion of the trip lever, the arm 103 will be moved out of engagement with the detent 102, whereupon the spring 101 will move the dog 98 into engagement with the ratchet 99 and cause the crank arm 97 to rotate synchronously with the gear 95. A suitable tension spring 108 normally retains the trip lever in the full line position shown in Figure 8. The trip lever 52 is shown provided with a hand grip 100 whereby it may be manually operated, when desired.

An intermittent gear 109 is secured to the shaft 96 and is operatively connected with an intermittent pinion 111 secured to a sleeve 112 rotatably mounted upon a stud 113 secured to the plate 9 and bracket 76, as shown in Figure 7. The sleeve 112 is provided at its lower end with a spur pinion 114 which meshes with the ring gear 13 secured to the table member 8, as hereinbefore stated. The intermittent gear 109 and pinion 111 are so designed and constructed that when the shaft 96 makes one revolution, the intermittent gear 111 will make one-third of a revolution, whereby the table member 8 will be rotated one step, in this instance, one-eleventh of a revolution, whereupon the detent 102 of the dog 98 will engage the abutment arm 103 and cause the dog 98 to be moved out of engagement with the ratchet 99 and thus temporarily interrupt further rotation of the shaft 96.

The ejector is actuated by an intermittent gear 115 secured to the shaft 96 and meshing

with an intermittent pinion 116 secured to the shaft 74 upon the upper end of which the crank arm 73 of the ejector is mounted. The intermittent gears 115 and 116 are so designed that for each revolution of the shaft 96, the ejector crank arm 73 will make one revolution. These gears 115 and 116 operate in timed relation with respect to the intermittent gears 109 and 111 so that the ejector does not commence to function until the table has been moved one full step, whereby a filled bag will be positioned in the path of the ejector, as shown in Figure 2.

When the novel bag shaker and feeder featured in this invention is operatvely connected with a bag closing machine, the operation of the latter is preferably controlled by the operation of the bag shaker and feeder. This may be accomplished by connecting the arm 88 of the clutch gear 86 with the operating mechanism of the bag shaker in such a manner that when the ejector is operating to eject a filled bag from a compartment and deliver it onto the table 81, the conveyer chain 80 of the bag closing machine will be at rest. As soon as the pusher plate has moved out of the path of the conveyer flights 84, on its back stroke, the lever 88 is operated to start the bag closing machine whereupon the conveyer chain 80 will operate to cause a flight 84 to engage the bag and feed it along the table or conveyer 81.

To thus actuate the lever 88, a suitable cam 117 is secured to the shaft 96 for direct rotation therewith. This cam is adapted to engage a roller 118 provided upon an arm 119 pivotally supported upon a bracket 121 suitably secured to one of the upright guides or posts 11, as shown in Figure 3. The arm 119 is connected to one end of a rod 122, the opposite end of which is connected with the lever 88 so that when the cam 117 actuates the arm 119, the rod 122 will operate the lever 88 and cause the clutch gear 86 to operatively engage the shaft 85, whereupon the conveyer chain 80, which it is understood, is operatively connected with the shaft 85, will be operated one step, it being understood that the clutch gear 86 comes to rest after each revolution in a manner similar to the gear 95, shown in Figure 8.

Operation

In the operation of this novel apparatus, the bags, after having been filled, are placed upon the platform 46 at the loading station S, and the operator then thrusts the bag forwardly until the latter is engaged with the feed rollers 47 and 48, whereupon the bag is fed into the compartment alined with the loading station. The bag, however, will come to rest in the position indicated at 51 in Figure 1. The next following bag 50 fed between the feed rollers, will engage the preceding bag 51 and move it into the compartment until the leading wall of the latter engages the trip lever 52, whereupon the mechanism will be actuated to cause the table to move one step. Because of the peripheral speed of the feed rollers being substantially the same as the peripheral speed of the spacing members 23, the portion of the bag which projects out of the pocket into the gap between the two feed rollers will be pressed inwardly until the opposite end of the bag engages the cylindrical wall 19, as hereinbefore stated. It will also be noted, by reference to Figure 1, that the periphery of the feed roller 47 projects within the inner surface of the outer cylindrical wall 32, so that as the bag leaves the feed roller 47, it will be confined within the opposite walls of the members 23 and the cylindrical walls 19 and 22, which thereafter will retain the bag walls in proper shape. During rotation of the table, the bag positioned between the feed rollers will engage the outer surface 60 of the following member 23, as shown in Figure 9, which, having a smooth periphery, will slide past the bag, at the same time holding the bag against movement until the next following compartment is alined with the station S, whereupon the bag being temporarily held between the feed rollers will be moved into the next following compartment. The peripheries of the feed rollers are smooth so that when the movement of the bag is temporarily interrupted by reason of one of the members 23 engaging the end of the bag, the rollers will simply slip on the walls of the bag until the member 23 has moved out of engagement with the end of the bag.

The circular track 45 is of such length that the rods 31 of the movable plates or bottoms 24 of the compartments will move out of engagement therewith just before each compartment comes to rest in alinement with the receiving means, in this instance, the table 81. The compartments, in traveling from the position in front of the ejector to the loading station S will remain idle, as will readily be understood by reference to Figure 3. The distance traveled by each bag from the time it is delivered into a compartment until it is ejected therefrom, is sufficient to cause the vibratory action imparted to the plates 24 to cause the flour or finely divided material contained in the bags to become thoroughly settled in the bags before the latter are ejected from the compartments. The machine is also so constructed that it may readily be operated by an inexperienced operator, it being only necessary to place the bags on the platform 46 at the loading station S, whereupon the rollers 47 and 48 will successively feed the bags into the compartments and cause the machine to operate.

I claim as my invention:

1. In an apparatus of the class described, the combination of a rotatable member pro-

vided with a plurality of compartments, means for feeding a container into each compartment and simultaneously pressing the container walls inwardly to shape the body of the container, means for causing a vibratory movement to be imparted to the containers in said compartments to settle the material therein, and means for ejecting the containers from said compartments.

2. An apparatus of the class described, the combination of a table mounted for intermittent rotary movement and provided with a plurality of compartments each adapted to receive a filled bag, rotary means for feeding a filled bag into each compartment and simultaneously compressing the walls thereof to shape the bag body, means for causing a jarring motion to be imparted to the bags in said compartments to settle the material therein, and means for ejecting the containers from said compartments.

3. In an apparatus of the class described, the combination of a table mounted for rotary movement and provided with a plurality of compartments each having a bottom mounted for up-and-down movement, means for feeding a filled bag into each compartment and simultaneously pressing the walls of the bag inwardly, means for actuating said bottoms to impart a shaking motion to containers supported in said compartments to cause material therein to settle, and means for actuating said table.

4. In an apparatus of the class described, the combination of a table mounted for intermittent rotary movement and provided with a plurality of compartments each having a movable bottom, means connected with each bottom and depending therefrom, a track mounted to engage said means, and mechanism for actuating said track to cause a vibratory movement to be imparted to said bottoms.

5. In an apparatus of the class described, the combination of table mounted for intermittent rotary movement and provided with a plurality of compartments each having a movable bottom adapted to support a container, means connected with each bottom and depending therefrom, a track mounted to engage said means, mechanism for actuating said track to cause an up-and-down movement to be imparted to said bottoms, and means positioned to be impinged by said bottoms on their downward movements whereby said bottoms will be jarred to cause the material in said containers to settle.

6. In an apparatus of the class described, the combination of a rotary member having a plurality of recesses in the upper surface thereof, resilient elements seated in said recesses, a plate normally supported upon said elements and adapted to support a container, a rod secured to each plate and slidably supported in guides provided in said member, and means adapted to elevate said plates and allow them to impinge against said elements whereby a jarring motion is imparted to said plates to cause the material in the container supported thereon to settle down.

7. In an apparatus of the class described, the combination of a rotary member having a plurality of recesses in the upper surface thereof, resilient elements seated in said recesses, a plate normally supported upon said elements and adapted to support a filled bag, a rod secured to each plate and slidably supported in guides provided in said member, a track mounted to engage said rods, and means for imparting an up-and-down movement of said track whereby a shaking movement will be imparted to said plates to cause the material in the bags supported thereon to settle down.

8. In an apparatus of the class described, the combination of a rotary table provided with a plurality of compartments, each adapted to receive a filled container, a resilient element seated in each compartment, a movable plate in each compartment supported on said elements and constituting the bottoms of the compartments, means constantly urging said bottoms into engagement with said resilient elements, and means for intermittently lifting said bottoms out of engagement with said elements, whereby they may forcibly impinge against said resilient elements and cause a jarring motion to be imparted to containers supported thereon.

9. An apparatus for settling material in bags, comprising a movable table provided with a plurality of compartments each adapted to receive a filled bag, means for feeding a bag into each compartment, means for shaping the walls of each bag as it is fed into a compartment, means for causing a vibratory movement to be imparted to the bags in said compartments to settle the material therein, means for actuating said table, and means for ejecting the bags from said compartments onto a suitable receiving means.

10. An apparatus for settling material in bags, comprising a rotary table provided with a plurality of compartments each adapted to receive a filled bag, means for feeding a bag into each compartment, means for exerting an inward pressure against the walls of each bag as the latter are fed into said compartments to shape the bag walls, means for causing a vibratory movement to be imparted to the filled bags in said compartments to settle the material therein as the table is rotated, and means for ejecting the bags from said compartments onto a suitable receiving means.

11. An apparatus for setting material in bags, comprising a table mounted for intermittent rotary movement and provided with a plurality of compartments each adapted to contain a filled bag, a loading station in-

cluding a pair of feed rollers adapted to feed a bag into each compartment, said feed rollers also being adapted to press inwardly opposite walls of each bag whereby the filled bags may readily be delivered into the compartments, means at the loading station adapted to be engaged by a bag delivered into a compartment to cause actuation of said table, whereby the loaded compartment is moved away from said station and an empty compartment is moved into alinement with the station to receive a bag, and means at the loading station for firmly pressing the filled bags into said compartments whereby the walls of the bags will be shaped to conform to the walls of the compartments.

12. An apparatus for settling material in bags, comprising a frame having upright cylindrical walls secured thereon and arranged one within the other to provide an annular recess, a member mounted for rotary movement within said recess, members secured to said rotary member in spaced relation and cooperating with said cylindrical walls to provide a plurality of compartments each adapted to receive a filled bag, a series of plates movably mounted on said rotary member and constituting the bottoms of said compartments, means for actuating said plates to cause a jarring motion to be imparted to the bags supported in said compartments, means for intermittently actuating said rotary member to feed the bags, and means for ejecting the bags from said compartments at a predetermined point.

13. In an apparatus of the class described, the combination of a table provided with a plurality of compartments each adapted to receive a filled open bag, a loading station, means at said station adapted to feed a bag into each compartment, a receiving station, mechanism for intermittently actuating said table whereby the bags will be fed from said loading station towards said receiving station, means at the receiving station for ejecting the bags from said compartments, means for causing a vibratory movement to be imparted to the bags supported in said compartments whereby the material contained in the bags will settle downwardly therein, and a trip situated at the loading station adapted to be engaged by each bag delivered into a compartment whereby said mechanism will operate to intermittently actuate said table and cause a bag to be ejected from one of said compartments onto said receiving station.

14. In an apparatus of the class described, the combination of a table provided with a plurality of compartments each adapted to receive a filled open bag, a loading station, means at said station adapted to feed a bag into each compartment, a receiving station, mechanism for intermittently actuating said table whereby the bags will be fed from said loading station towards said receiving station, means at the receiving station for ejecting the bags from said compartments, means for causing a vibratory movement to be imparted to the bags supported in said compartments whereby the material contained in the bags will settle downwardly therein, means for shaping the walls of the bags as the bags are delivered into said compartments at the loading station, and a trip situated at the loading station adapted to be engaged by each bag delivered into a compartment whereby said mechanism will operate to intermittently actuate said table and cause a bag to be ejected from one of said compartments onto said receiving station.

15. In combination, a loading station and a receiving station, a member movable between said stations and adapted to convey filled open bags or containers from the loading to the receiving station, means operable to impart a jarring motion to the bags to settle the material therein as they travel between said stations, means for shaping the body of each bag, and means at the receiving station adapted to eject the filled bags from said movable member.

16. In combination, a loading station and a receiving station, a member movable between said stations and adapted to convey filled open bags or containers from the loading to the receiving station, means operable to impart a jarring motion to the bags to settle the material therein as they travel between said stations, means at the loading station capable of shaping the body of each bag as it is delivered into said member, means for intermittently actuating said movable member, and means at the receiving station adapted to eject the filled bags from said movable member.

17. In an apparatus of the class described, a support provided with a compartment adapted to receive a filled container, means for delivering a container to said compartment and discharging it therefrom, means intermediate to the delivery and discharge operations adapted to impart a vibratory movement to the container in said compartment to settle the material in the container, and means for shaping the walls of the container as it is delivered into the compartment.

18. In an apparatus of the class described, a movable support provided with a compartment adapted to receive a filled container, means for delivering a container to said compartment, means for imparting a vibratory movement to the container in said compartment to settle the material therein, means for ejecting the container from the compartment, and shaping-rollers arranged to engage and shape the walls of the container as it is delivered into the compartment.

19. In an apparatus of the class described,

a movable support provided with a compartment adapted to receive a container, means for delivering a filled container to said compartment, and shaping the walls of the container, means for imparting a vibratory movement to the container in said compartment to settle the material therein, and means for ejecting the container from said compartment.

20. In an apparatus of the class described, a movable support provided with a compartment adapted to receive a container, means for delivering a filled container to said compartment, means for pressing the walls of the container inwardly to shape the body of the container as it is delivered to the compartment, a movable bottom for the compartment, and means for actuating said bottom to impart a vibratory movement to the container in said compartment to settle the material therein, during movement of said support.

21. In an apparatus for feeding filled paper bags from one station to another, a member provided with a plurality of compartments each adapted to receive a filled bag, the walls of said compartments being arranged to substantially conform to the shape of the bag body whereby said compartments provide forms adapted to support the walls of the bags and prevent them from bulging, while the bags are in transit, and means for vibrating the bags in said compartments to cause the material therein to settle.

In witness whereof, I have hereunto set my hand this 16th day of April, 1930.

HELMER ANDERSON.