

Jan. 17, 1939.

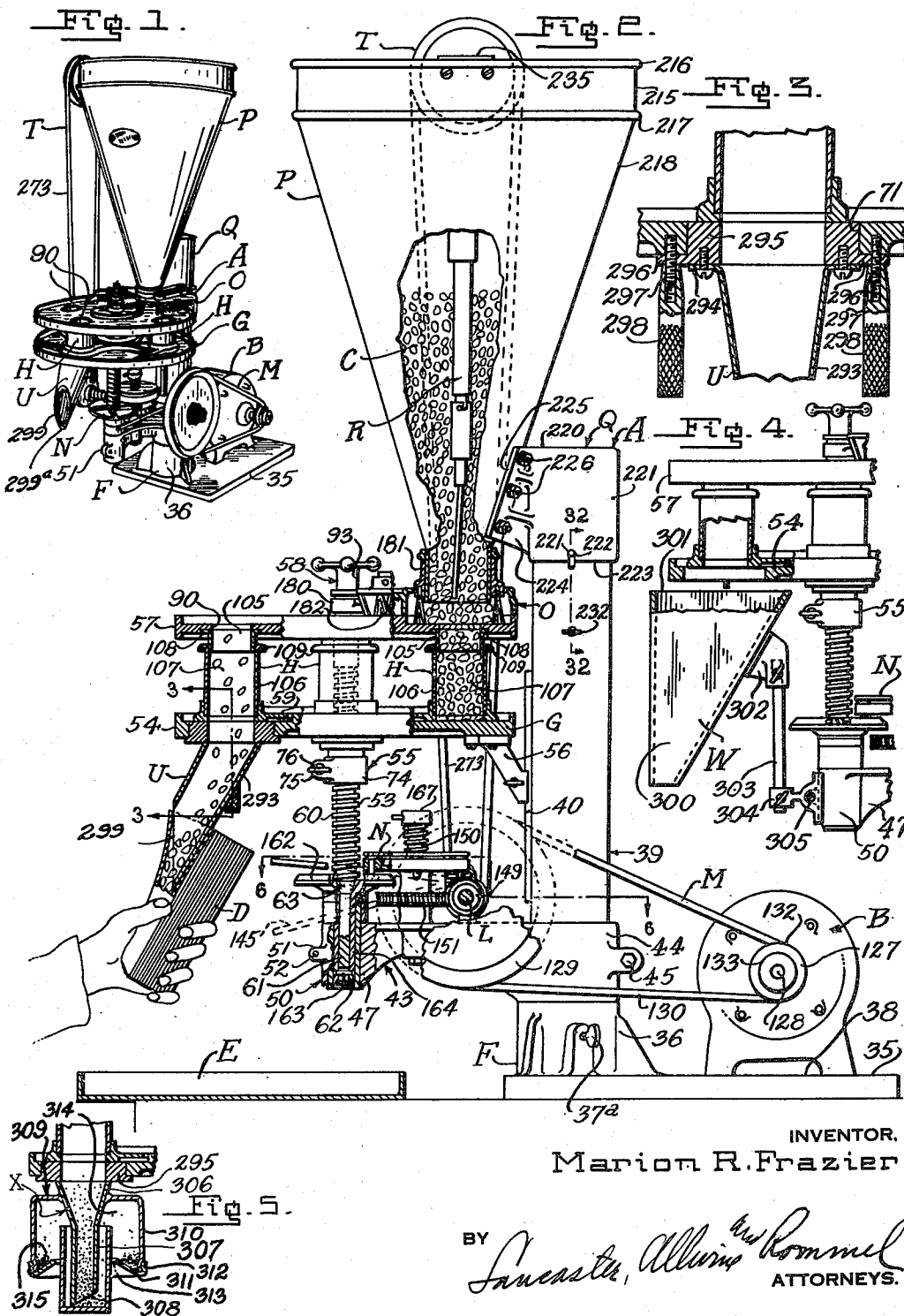
M. R. FRAZIER

2,144,569

PACKAGE FILLING MACHINE

Filed Feb. 19, 1936

5 Sheets-Sheet 1



Jan. 17, 1939.

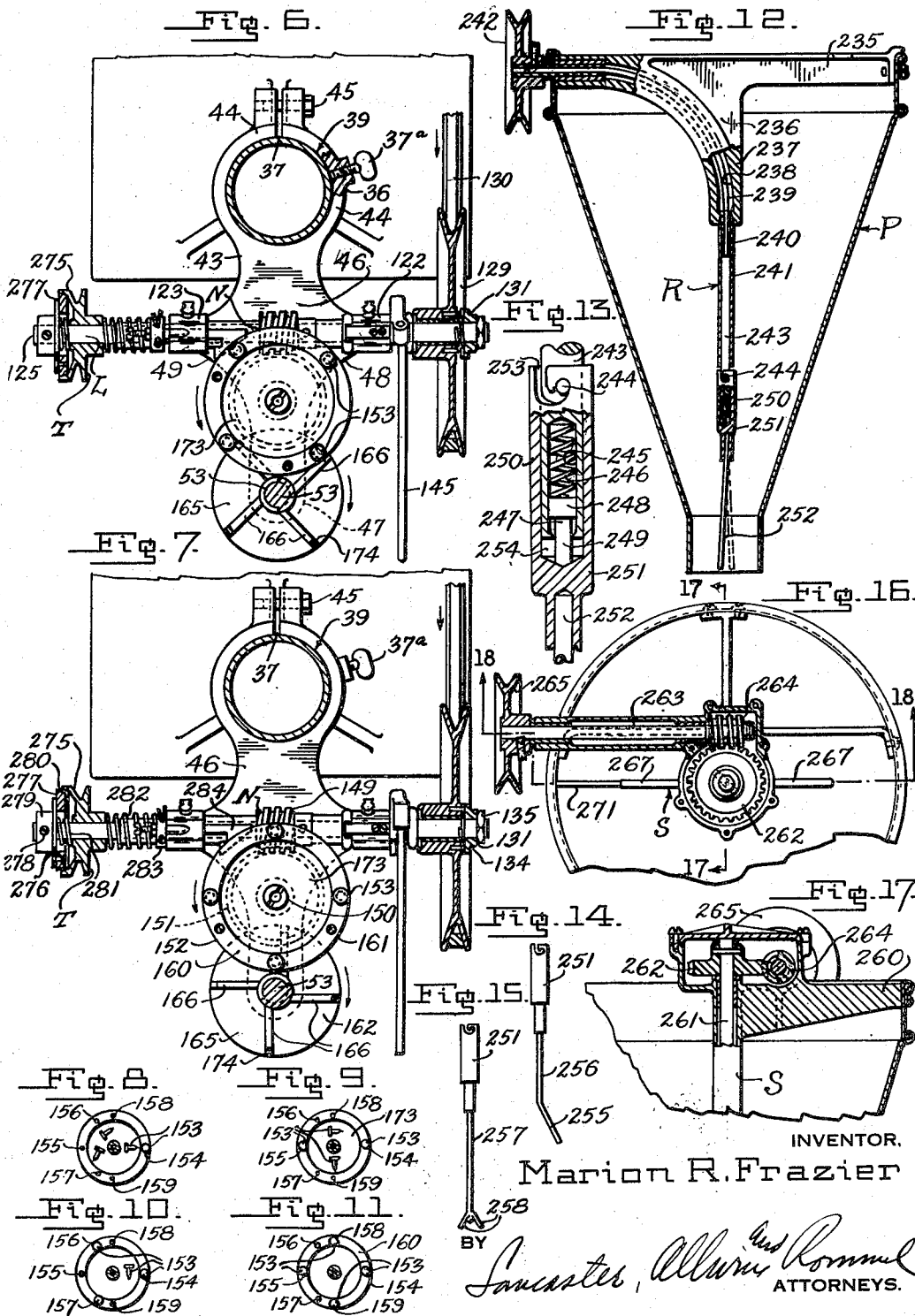
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5 Sheets-Sheet 2



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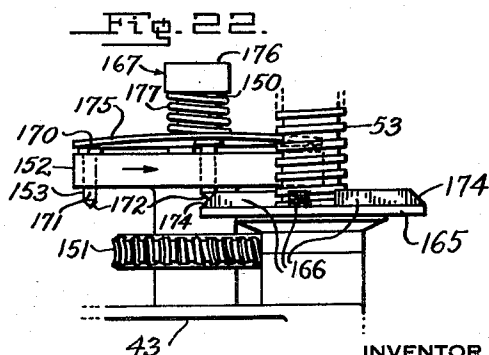
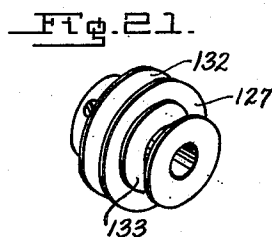
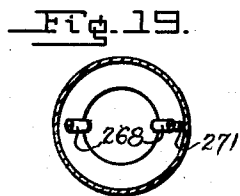
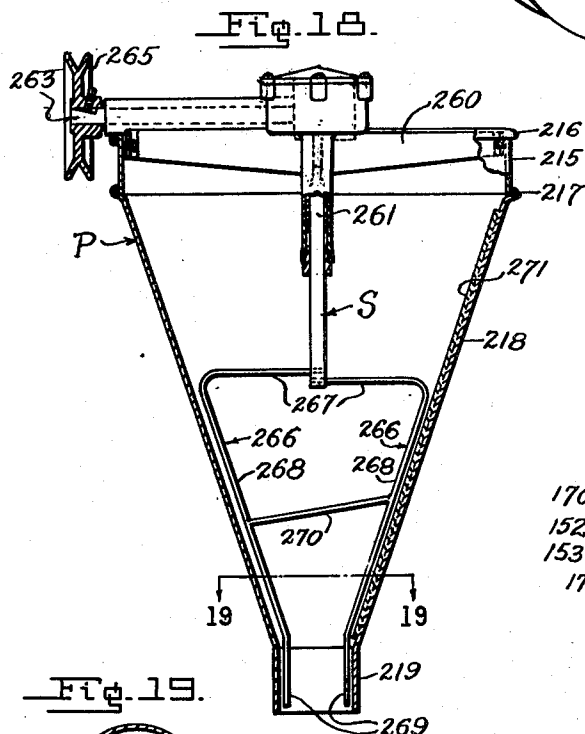
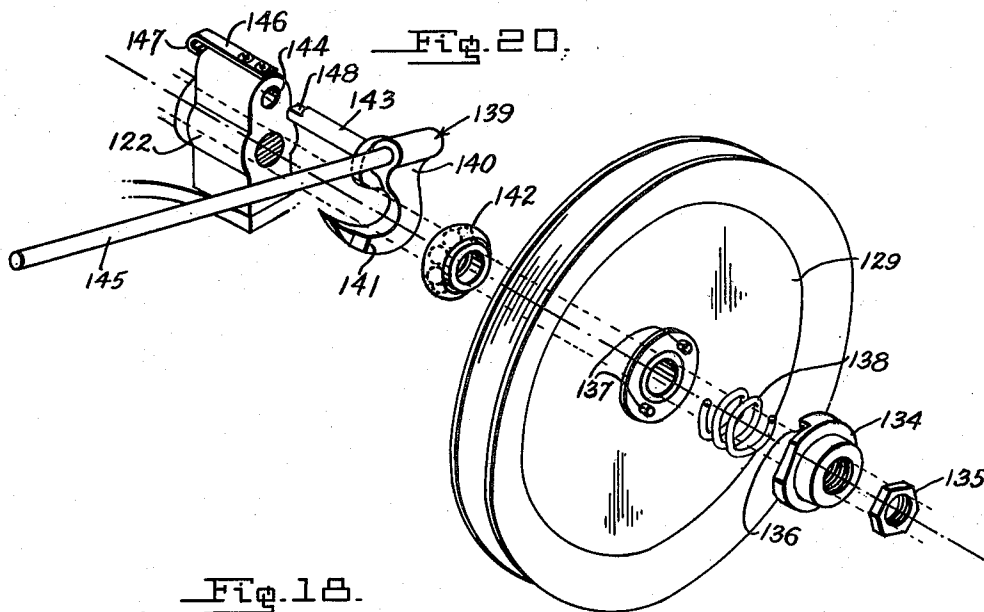
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PACKAGE FILLING MACHINE

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5 Sheets-Sheet 3



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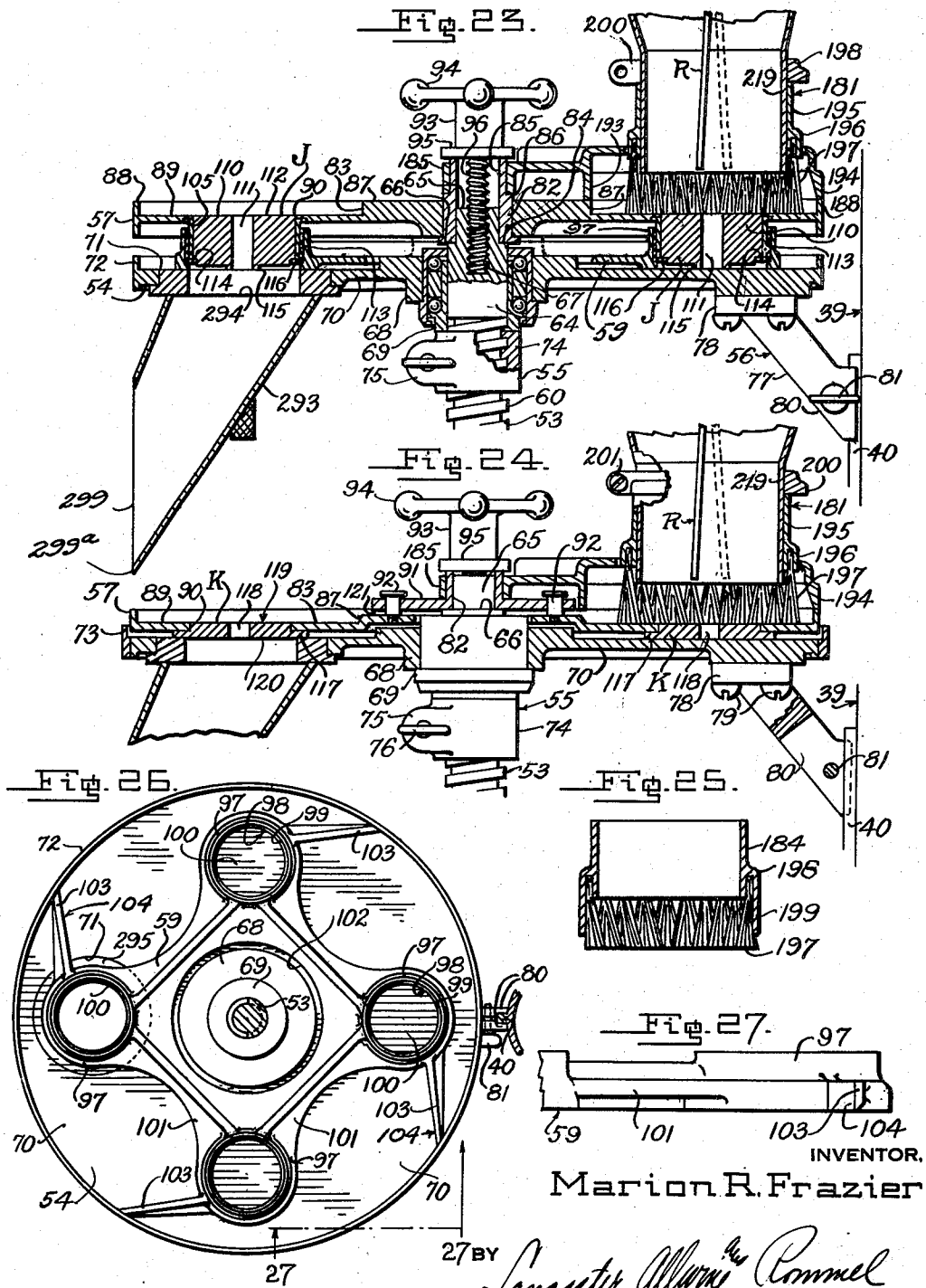
M. R. FRAZIER

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PACKAGE FILLING MACHINE

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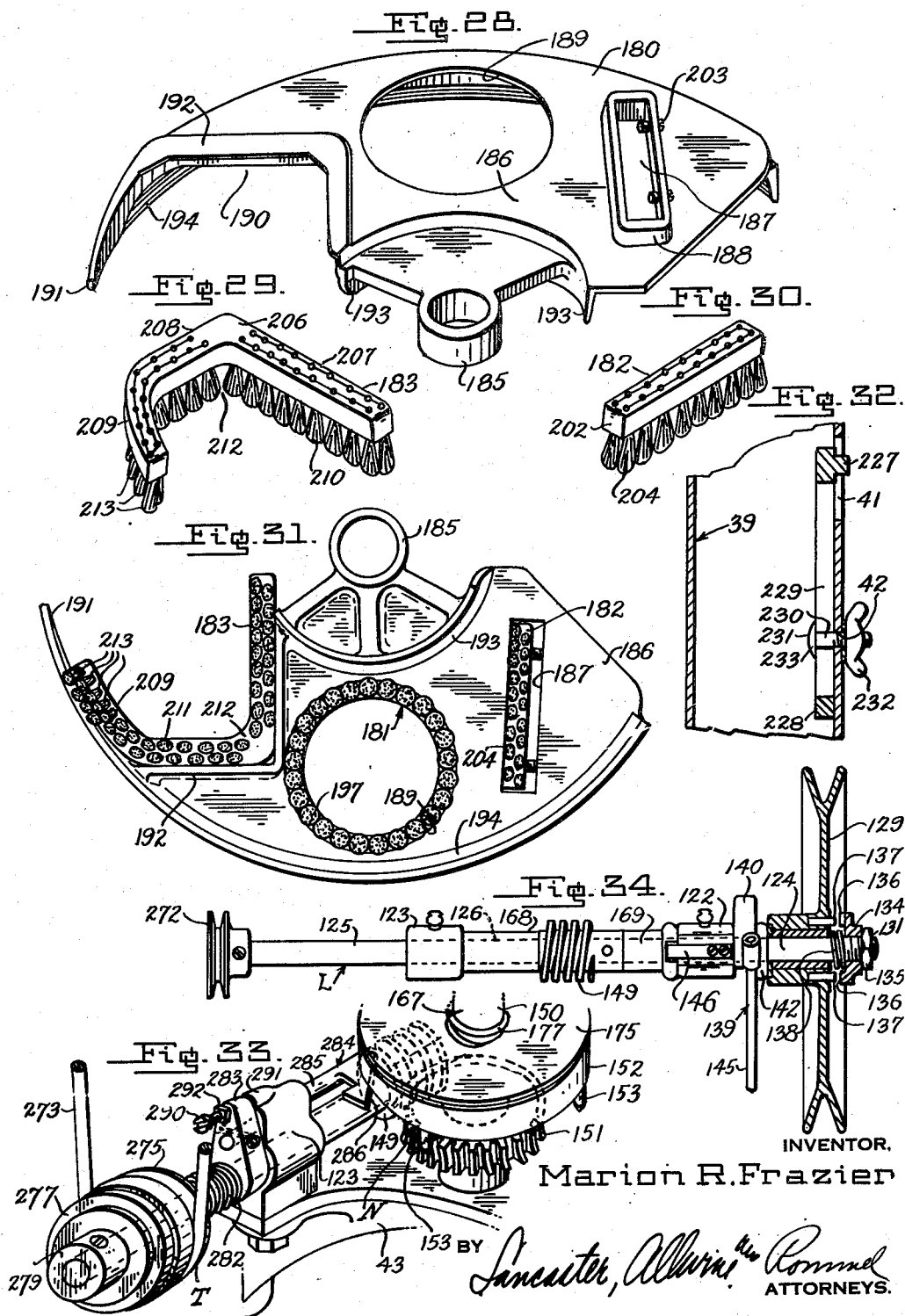
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PACKAGE FILLING MACHINE

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UNITED STATES PATENT OFFICE

2,144,569

PACKAGE FILLING MACHINE

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Application February 19, 1936, Serial No. 64,764

21 Claims. (Cl. 221—109)

The present invention relates to machines for use in packaging a wide variety of materials such as powders, crystals, nuts, candies, seeds, pills, coffees, spices, etc., and has for its principal object the provision of machines which accurately, quickly and quietly measure such merchandise and deliver same to packages, such as bags, envelopes, boxes, etc., which may be automatically or manually placed beneath the delivery spouts of the machines, and machines which may be easily cleaned, quickly adjusted to meet various requirements and which are compact and simple in operation so as to not require the attention of skilled workmen in order to operate and keep them in good running condition.

Another object of the invention is to provide machines which are power driven, in contradistinction to those which are foot or hand operated, and which are quickly adjusted so as to set the operator's pace. By way of example, the machine may be quickly adjusted to provide a rate of discharge per minute suitable to the ability of the operator, taking into consideration the particular material being measured. In a practical embodiment of the invention it has been found suitable to arrange for a rate of discharges of say either twenty, forty, sixty or eighty per minute. This may be accomplished by the use of novel gear assembly and indexing wheel as hereinafter described.

Another object of the invention is to provide as part of the equipment of the machines which are adapted for use in the packaging of various products or various size packages of the same product, a plurality of extensible cups for each machine which may be quickly, simultaneously and easily adjusted to provide various sizes of cells or chambers.

A further object of the invention is to provide an improved delivery spout for use when filling bags, envelopes and the like which are usually packed, shipped and stored in flat condition, to facilitate quick opening or expanding of at least the mouth portions to receive the measured material delivered by the machine.

Another object of the invention is to provide improved means for guiding the material into and leveling the measuring cups so as to avoid jamming of or damage to parts of the machine or the material passing thru the machine, and to assure uniform quantities of materials in the series of cups.

A further object is to provide a gear assembly and indexing wheel combination for machines of this character that will not jam even

tho the parts may have been accidentally or intentionally moved either before or during operation to positions which are not usual for a cycle of operation.

Another object is to provide means for agitating the material in the hoppers of the machines without churning or grinding of the material to be measured and to render such means adjustable so that selection may be had to either continuously agitate or intermittently agitate only when a measuring cup is in communication with the feed hopper.

A further object is to provide means to eliminate the accumulation of surplus or overflowing material on parts of the machine by delivering such surplus or overflow to empty cups as fast as it is deposited.

Other objects and advantages of the invention will appear in the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification, and in which drawings:

Figure 1 is a perspective view of a package filling machine constructed according to the present invention and equipped with extensible measuring cups.

Figure 2 is a detail view, partly in elevation and partly in vertical section of the machine shown in Figure 1, parts being broken away to disclose some of the details.

Figure 3 is an enlarged vertical sectional view on the line 3—3 of Figure 2, looking in the direction of the arrows.

Figure 4 is a detail view, partly in elevation and partly in vertical section of a modified form of delivery spout, and parts adjacent thereto, particularly suitable for use where a plurality of measuring cup discharges are to go into the same package placed beneath the spout.

Figure 5 is a similar view of a further modified form of delivery spout.

Figure 6 is a horizontal sectional view on the line 6—6 of Figure 2 showing the relative position of parts for motion transmitting relation with the hopper agitator, when the machine is equipped for intermittent agitation of the material therein, the parts being in position for agitation.

Figure 7 is a view similar to Figure 6 but showing the motion transmitting mechanism in condition to render the agitator inactive.

Figures 8, 9, 10 and 11 are plan views of a selector device forming a part of motion transmitting means between the prime mover and a measure carrier with pins arranged for different rates

of discharges—by way of example, twenty, forty, sixty and eighty, respectively, per minute.

Figure 12 is a detail view partly in vertical section and partly in elevation of a feed hopper and agitating mechanism associated therewith.

Figure 13 is a similar view showing means for detachably connecting an agitator arm to the drive shaft of the agitating mechanism.

Figures 14 and 15 are elevations of modified forms of agitating arms.

Figures 16 and 17 are views partly in plan and horizontal section, and partly in elevation and vertical section, respectively, of motion transmitting means for a modified form of agitating mechanism.

Figure 18 is a view partly in vertical section and partly in elevation of the motion transmitting means shown in Figures 16 and 17, and the modified agitating mechanism.

Figure 19 is a horizontal sectional view on the line 19—19 of Figure 18 looking in the direction of the arrows.

Figure 20 is a perspective view of parts, before assembly, including a driven pulley and clutch device forming a part of the motion transmitting means between the prime mover and measure carrier.

Figure 21 is a perspective view of a drive pulley for use on the shaft of the prime mover, to obtain different speeds in the driving of the machine.

Figure 22 is a detail view in elevation of the selector device and associated parts.

Figure 23 is a detail view in part elevation and part vertical section of a measure carrier and associated parts, where the measuring units are not of the extensible cell or chamber type.

Figure 24 is a similar view with different measuring units associated with the measure carrier.

Figure 25 is a central vertical sectional view thru a collar brush differing from the form shown in Figures 23 and 24.

Figure 26 is a view partly in plan and partly in horizontal section of a portion of the measure carrier, showing a spider having powder scrapers integral therewith.

Figure 27 is an enlarged view in elevation of the spider substantially along the line 27—27, looking in the direction of the arrows, Figure 26.

Figure 28 is a perspective view of a brush or stripper support, associated with the measure carrier.

Figures 29 and 30 are perspective views of strippers or brushes.

Figure 31 is a bottom plan view of the frame and brushes shown in Figures 28—30.

Figure 32 is an enlarged sectional view on the line 32—32 of Figure 2.

Figure 33 is a fragmentary perspective view of motion transmitting means whereby intermittent agitation of material in the feed hopper may be obtained.

Figure 34 is a view partly in plan and partly in horizontal section of a portion of the drive mechanism.

In the drawings, where like characters designate like or corresponding parts thruout the several views, A is the machine including a prime mover B, such as an electric motor; C the material passing thru the machine; D a bag or other receptacle for the material C measured by the machine; and, E a tray for catching material which may drop from the machine and not find its way into the receptacle D.

The machine A comprises a frame F; a measure

carrier G; a plurality of measure units H as shown in Figures 1 and 2, or J as shown in Figure 23, or K as shown in Figure 24; a driven shaft L; motion transmitting means M between the prime mover B and shaft L; motion transmitting means N between shaft L and carrier G; stripper means O; a feed hopper P; means Q for supporting the hopper on the frame F and for adjusting the position of the hopper with respect to the measure carrier G; agitating mechanism R as shown in Figures 2, 12, 23 and 24 or S as shown in Figures 16, 17 and 18, in the hopper; motion transmitting means T between shaft L and the agitating mechanism; and, a delivery spout U as shown in Figures 1, 2 and 3, or W as shown in Figure 4, or X as shown in Figure 5, for different kinds of material.

The frame F preferably comprises a base plate 35 including an upstanding flange or collar 36 near one end thereof providing a socket 37, and a large flat area 38 for support of motor B; a vertical column 39 having its lower end portion secured in the socket 37 as by a set screw 37^a, the column provided with a longitudinal rib 40 at its intermediate portion, a longitudinally extending slot 41 near its upper end, and a hole 42 adjacent to and below the slot; and, a bracket 43 adjustably secured to the column and projecting laterally therefrom, preferably directly above the flange or collar 36 and extending from the side of the column opposite to the motor receiving area 38. The bracket 43 preferably includes a split sleeve portion 44 embracing the column and a bolt 45 for clamping the collar to the column; and, a main body portion 46 having three arms 47, 48 and 49 extending therefrom and a support sleeve 50 at the end of arm 47. The support sleeve may be provided with a lug 51 having a transverse hole 52, for support of a delivery spout as hereinafter described.

The measure carrier G preferably comprises a revoluble standard 53 supported by arm 47 in any suitable manner and preferably as hereinafter described; a non-rotatable adjustable lower table 54, preferably disc-like in shape thru which the standard 53 extends; an adjustable support 55 on the standard below table 54; a detachable coupling 56 associated with table 54 and column 39; a rotatable upper table 57, also preferably disc-like in shape, above table 54; means 58 for coupling the upper table to standard 53 in an adjustable manner, and to rotate therewith; and, a spider 59 which may rest loosely upon table 54 and rotate with table 57, this spider preferably being used only with measuring units of the extensible cell or chamber type. The standard 53 preferably comprises a relatively long screw threaded intermediate portion 60, a reduced shank-like portion 61 forked at its lower portion to provide a bottom opening slot 62, and upwardly tapering at its upper portion as at 63, and a cylindrical head 64 at its upper portion surmounted by a reduced cylindrical stub 65, providing a shoulder 66, there being a screw threaded bore 67 extending downwardly thru the stub and open at the top of the standard. The table 54 is detachable from standard 53 and column 39, and table 57 is detachable from the standard since different types may be used with different types and sizes of measuring units. In Figures 1, 2, 3, 4 and 23, the table 54 is for use with measuring units H and J, which have cells of considerable size as compared with the cells of unit K shown in Figure 24, which are very small. Generally the table 54 comprises a hub

68 preferably carrying an anti-friction bearing 69 closely surrounding standard 53 either at head 64 or threaded portion 60, and a flat web or table proper 70 upon which the measuring cups slide.

5 The web 70 has a single opening 71 for egress of material C in the measuring units as they pass over the opening. An upstanding annular flange 72 may be provided integral with the web 70 at its outer periphery, as shown in Figure 23, or an

10 upstanding flange 73 may be detachably carried by the web 70 in a similar position, as shown in Figure 24. The adjustable support 55 is preferably in the form of an internally screw threaded split sleeve 74, for threaded engagement with

15 threaded portion 60 of standard 53, and provided with ears 75 for clamp screw 76, whereby the sleeve may be held in any of its many adjusted positions. The hub 68 or bearing 69 of table 54 rests upon sleeve 74, and by releasing screw 76,

20 sleeve 74 may be moved up or down on standard 53 thereby moving table 54 toward or from table 57. The coupling 56 which detachably associates the table 54 with column 39 preferably comprises an angularly disposed arm 77 secured to the

25 table 54 by plate 78 and screw 79 at a point diametrically opposite from opening 71, and jaws 80 in embracing relation to rib 40, the jaws capable of being drawn into tight engagement with the rib by thumb screw 81. By this arrangement

30 it is to be observed the table 54 is held against rotation in any of its many adjusted positions, and the standard 53 is rotatably supported intermediate its ends thru the hub or anti-friction bearing. However, the table 54 may be quickly

35 detached from the standard and column for cleansing purposes. Generally the table 57 comprises a hub portion 82, preferably of a harder and heavier material than a web or table portion 83 which it carries with it in its rotation with standard 53. In Figure 23, the hub portion 82

40 is rigid with the web portion 83 and comprises a base 84 normally resting on shoulder 66, having a tight fit with web 83, and a reduced upstanding annular flange 85 providing a shoulder 86. The web portion has an inner annular upstanding

45 flange 87 and an outer annular upstanding flange 88 providing a relatively wide annular channel 89 open at the top of the table in which brushes of stripper means O operate as hereinafter described. The web has a plurality of openings 90

50 spaced equi-distant from each other and from the axis of standard 53, these openings being in communication with channel 89. In the example shown, there are four of such openings thru which material C passes into the measuring units.

55 In Figure 24, the hub portion 82 is not rigid with web or table portion 83, but nevertheless it carries the latter with it as the standard 53 revolves. This is accomplished by making the hub base 91 of but little depth, and considerably wider, so that

60 shoulder screws 92 may connect it to the web portion yet permit some up and down movement of the web portion with respect to the hub as is obvious from an inspection of Figure 24. Other-

65 wise the rotatable upper table 57 is substantially like that shown in Figure 23, providing as it does the channel 89 with which openings 90 have communication, it being understood that the form shown in Figure 24 is particularly well adapted for use with measuring units having relatively

70 small cells. Means 58 for coupling the upper table to the standard may comprise a head 93 having a hand gripping portion 94 at its upper end, and a flange 95 at its lower portion; and,

75 a screw threaded shank 96 for threaded engage-

ment in bore 67. Assuming that table 57 rotates clockwise when viewed from above, it is preferred to provide shank 96 with a left hand thread thus tending to keep flange 95 firmly upon flange 85 and the table coupled to the standard. The

5 spider 59 is particularly well adapted for use with measure units H, which are of the adjustable type, and functions to equally space the lower portions of the units; permit the use of relatively thin material in the production of said

10 units and otherwise assists in providing a smooth running machine. It preferably comprises a plurality of annular sleeves 97, in number corresponding to the number of measure units used during operation of the machine, each sleeve

15 having an internal annular flange 98 at its bottom providing a seat 99 for a part of the measure unit as hereinafter described, and a discharge opening 100 for the material C. The sleeves 97 are held in proper spaced relation by webs 101

20 having a central opening 102 to clear the hub 68. The spider 59 may be provided with scraper fingers 103, one for and preferably integral with each sleeve 97, adapted to move fluent material, such as powder, which may escape from beneath

25 the measure units onto the web 70, into the discharge spout. These fingers project from the lower portions of the sleeves, bear upon the table 54, extend to points closely adjacent the flange 72, and have a leading edge 104 extending from

30 flange 72 into the path of measuring units above the discharge opening 102, so as to guide such stray material into the discharge spout as the spider revolves.

Referring now to the measure units H shown

35 more particularly in Figures 1 and 2, these are particularly well adapted to cover most of the ounce discharges. Each preferably comprises an upper tubular shell 105 carried by and depending from table 57, telescoped by a lower tubular shell 106 providing cells or chambers 107.

40 Each shell 106 rests on the seat 99 of its respective sleeve of spider 59. By raising or lowering the table 57, as by use of adjustable support 55, the size of the cell or chamber 107 may be varied.

45 The shells 105 may each be provided with an outstanding annular flange 108 at its upper end, secured to the under side of the web portion 83. The upper end of each shell 106 may be provided with an outstanding flared annular flange 109

50 which avoids material friction between the two shells during adjustment to enlarge or diminish the cell or chamber 107. The proportions both as to height and diameter of the shells 105 and 106 and of sleeves 97 of spider 59 are merely by

55 way of example, it being understood that shells of much larger proportions may be used so as to have a capacity of a pound or even more, altho for large packages it is best to use the discharge of a plurality of measure units for filling

60 each package. As a typical example of the size of measure units H, in actual reduction to practice it has been found that the upper tubular shells 105 may depend from the table 57 slightly more than one-half inch, while the lower tubular shells 106 may be furnished in sizes varying from $\frac{5}{8}$ " up to $4\frac{1}{8}$ " in height, the diameter of the cells while remaining constant, an adjustment of substantially $\frac{1}{2}$ " in height may be obtained by such series. Larger cups may be provided, where the upper tubular shell 105 depends from table 57 say $1\frac{1}{2}$ ", and sets of lower tubular shells may be provided which in height vary from

70 1" to $3\frac{1}{2}$ " in height, the diameter of the cells

75

remaining constant, but adjustment of substantially $1\frac{3}{8}$ " in height being possible.

The measure units J shown in Figure 23 are particularly well adapted for use with the same lower and upper tables 54 and 57 shown in Figure 2, and also to use spider 59 and the upper tubular shells 105. The capacity of these measuring units may also be slightly varied as hereinafter noted. The measure units J are for small discharges, but not the very small discharges since the measure units K are for the latter, and will be subsequently described. Units J each comprise a cylindrical body 110 having an axially disposed cell or chamber 111 open to the top face 112 and the bottom face of the body, and a filler sleeve 113. The body 110 is of reduced diameter at its bottom to provide a downwardly facing shoulder 114 and has a flange 115 about the lower end of cell 111 which rests on the web 70 of table 54, thereby reducing friction and the liability of material escaping from the cell except when open to the discharge spout. The filler sleeve 113 fits between cylindrical body 110 and sleeve 97 of spider 59, the flange 116 resting on seat 99. This filler sleeve 113 takes the place of lower tubular shell 106 in its relationship to the spider. The cylindrical body 110 rests with its shoulder 114 on flange 116. The diameter of the cells 111 in different sets of cylindrical bodies 110 may, by way of example, vary from $\frac{1}{4}$ " to $1\frac{5}{8}$ ". The slight adjustment which may be had by use of measuring units J is accomplished by initially having the top face 112 of each body 110 flush with the bottom of channel 89, as shown in Figure 23. Then, by lowering the table 54, the body 110 drops so that its top face 112 is slightly below the bottom of the channel. Thus additional material accumulates on the top of the cylindrical body 110, but only the core of the additional amount drops out of said body when the discharge spout is reached, the remaining material being carried on for other cycles of operation.

The measure units K are for very small discharges. Each is preferably a single disc-like member having a flange 117 and an axially disposed cell or chamber 118 open to the top face 119 and bottom face 120. The upper part of the body fits openings 90 as shown in Figure 24. It has been found practical to have the cell or chamber 118 of a capacity as low as one-hundredth of a teaspoonful. When using these units K, the table 54 should be adjusted by movement of the adjustable support 55 so that there is a space at 121, between the hub face 91 and the flange 87 of about the thickness of an ordinary post card. In actual reduction to practice it has been found that these units may be made in various sizes, varying from $\frac{3}{8}$ " to 1" in height, and with the cells varying in diameter from $\frac{3}{4}$ " to $1\frac{5}{8}$ ".

In connection with both types of measuring units J and K, a change may be had by merely lowering the table 54 sufficient to permit removal of the measuring units previously used and the substitution of those which it is desired to use and again adjusting the table 54 upwardly to the desired extent. Slight adjustments in discharge of measuring units K may also be had in a manner similar to that described in connection with units J.

The driven shaft L is horizontal and is supported by spaced bearings 122 and 123 detachably mounted on the arms 48 and 49, respectively, of bracket 43. The shaft has end portions 124 and 125, and an intermediate portion 126, to receive

parts of motion transmitting means as hereinafter described.

The motion transmitting mechanism M comprises a pulley 127 on the drive shaft 128 of motor B, a pulley 129 slidable longitudinally on the end portion 124 of driven shaft L, a belt 130 trained about pulleys 127 and 128, and a clutch device 131. The pulley 127 may be changed end for end on the motor shaft to get different speeds. As an example, the large end 132 receiving the belt 130 may be used for speeds of 20, 40, 60 and 80 discharges per minute, and the small end 133, receiving the belt, may be used for speeds for 15, 30, 45 and 60 discharges per minute. To take up undesirable slack in belt 130, the screw 37^a may be released and the bracket 43 moved thru a slight arc, as is clear from an inspection of Figures 6 and 7, after which screw 37^a should be tightened. The clutch device 131 comprises a nut 134 secured on the end of shaft L, preferably by use of a lock nut 135, the nut 134 having teeth 136 for cooperation with teeth or pins 137 on the hub of pulley 129, an expansion spring 138 interposed between the nut 136 and hub of the pulley, tending to throw the teeth 136 and 137 out of engagement, and a cam device 139 for moving pulley 129 and the teeth into driving engagement. The cam device 139 comprises a hook-shaped cam 140, the throw side 141 of which is adapted to engage an anti-friction bearing 142 encircling shaft L and associated with the hub of pulley 129, the cam being pivotally mounted on the upper portion of bearing 122 by a pivot pin 143 paralleling shaft L and operating in a bore 144 in said bearing 122; a lever 145 secured to the cam 140; and a spring 146 surmounted on bearing 122 having a bill 147 adapted to engage a flat surface 148 on the end of pin 143 when the cam is forcing teeth 136 and 137 into driving engagement. By lowering lever 145 spring 146 will expand, forcing the pulley 129 and bearing 142 toward bearing 122, disengaging the teeth 137. The bill 147 of spring 146 will then ride on a curved portion of the pin 143.

The motion transmitting mechanism N comprises a worm 149 secured to shaft L between bearings 122 and 123, a fixed upright shaft 150 carried by brackets 43; a worm wheel 151 rotatable on shaft 150 and meshing with worm 149; a selector or indexing device 152 mounted on shaft 150, upon and movable with worm wheel 151, and one or more drive pins 153 adapted to be disposed in any one of openings, in the example shown, six in number, designated 154, 155, 156, 157, 158 and 159, located at and extending thru the rim 160 of a wheel 161 and equidistant from the axis of shaft 150; and, a star wheel 162 secured to standard 53, as thru cross pin 163 carried by a depending sleeve 164 of the star wheel fitting in the support sleeve 50 of bracket 43, this pin 163 fitting slot 62 in the lower end of standard 53. The star wheel comprises a disc-like body portion 165 and a plurality of radial ribs 166 for cooperation with the pin or pins 153 carried by the selector or indexing device 152. A safety or non-jamming mechanism 167 may form a part of this motion transmitting mechanism, in the nature of a yieldable retainer for the pin or pins 153 whereby any one may move from a normal to an abnormal position out of the path of the star wheel if the selector or indexing device and star wheel are not in correct position for a cycle of operation. The worm 149 may be centered between bearings 122 and 123, and the shaft L held against longitudinal movement, by

spacing sleeves 168 and 169, as shown in Figure 34. Each pin 153 preferably comprises a head 170, a shank 171 and a conical lower end portion 172, shown more in detail in Figure 22. The wheel 161 is preferably provided with an annular recess 173 at its upper face in which may be placed those drive pins 153 which may not be used in the operation of the machine, some such pins being shown in the recess, in Figures 8, 9 and 10. The number of radial ribs 166 on the star wheel 162 correspond to the number of measuring units associated with the measure carrier. In the present example, four of such ribs are shown, which have beveled outer ends 174 upon which the conical end portion 172 of any of the drive pins 153 may ride, if the star wheel happens to come to rest with the beveled outer end of the rib directly in the path of the drive pins. The safety or non-jamming mechanism 167 may comprise a pressure applicator or plate 175 bearing upon the head 170 of any or all of the drive pins 153 carried by the wheel 152, a detachable cap 176 on the upper end of shaft 150; and, an expansion coil spring 177 interposed between cap 176 and pressure applicator or plate 175. In Figure 22 one of the drive pins 153 is shown riding up the beveled outer end 174 of one of the ribs 166. This view also shows the pressure applicator or plate 175 lifted, compressing spring 177. As the wheel 152 continues to rotate in the direction indicated by the arrow, the drive pin referred to will ride upon the top of the rib 166 and finally slide off same in readiness to operate the measure carrier G, as soon as the said drive pin engages the next adjacent rib of the star wheel. By removing cap 176 and spring 177, as well as the pressure applicator or plate 175, access may be had to the recess 173 in wheel 152 in order to make use of drive pins 153 stored therein, or place such pins loosely therein, when not in use. Figures 8-11 show typical uses of the drive pins. In Figure 8 one pin is located in opening 154, the other pins being in the recess 173. This is the arrangement suitable for driving the measure carrier at a speed whereby but twenty discharges per minute will be had. In Figure 9 two drive pins are in use, in openings 154 and 155. This is an arrangement suitable for forty discharges per minute. In Figure 10, drive pins are located in openings 154, 156 and 157, an arrangement suitable for sixty discharges per minute, and finally in Figure 11, the drive pins are shown in openings 154, 155, 158 and 159 which may bring about eighty discharges per minute. The foregoing is merely by way of example and of course with the assumption that the belt 130 is received by the large end 132 of pulley 127. If the small end 133 of pulley 127 receives the belt, the corresponding pin arrangement shown in Figures 8, 9, 10 and 11 may be for discharge speeds of fifteen, thirty, forty-five and sixty discharges per minute.

In order that the motion transmitting mechanism N between the shaft L and the carrier G may cause one of the measuring units to dwell or come to rest beneath the hopper P and one of the measuring units above the delivery spout U, or W, or X, as the case may be, the procedure is to loosen head 93 and start the machine as by operation of lever 145 until one of the pins 153 has reached the position shown in Figure 6, that is, at the end of one of the ribs 166, the direction of rotation of the parts being indicated by arrows. The machine should then be stopped by again operating lever 145 and upper table 57 ro-

tated until one of the measuring units is directly under the feed hopper and the diametrically opposite measuring unit directly over the delivery spout, whereupon means 58 may again be operated to couple said table with the standard 53 to be rotated therewith.

Stripper means O preferably comprises a stripper support 180 and one or more strippers, in the example three in number designated 181, 182 and 183, in Figures 29, 30 and 31, and a modified form in Figure 25, numbered 184. The stripper support includes a hub 185; a horizontal segmental web portion 186, preferably provided with an elongated opening 187, bounded by an upstanding flange 188, a circular opening 189, and a recess 190 at its end portion 191, said recess preferably bounded by a flange 192 acting as an abutment for the stripper brush 183; and, inner and outer arcuate flanges 193 and 194, respectively, struck from the hub center and depending from the web portion 186 at either side of the openings 187 and 189, and recess 190.

It is to be noted that strippers 181, 182, 183 and 184 have soft bristles, that is, non-metallic bristles, so all metal connection is avoided in the actual transfer of the product to the measuring units and in leveling such units. There is nothing to shear or injure delicate products as the filled measuring units pass from beneath the hopper and travel to the delivery spout.

The stripper or brush 181 shown in Figures 23 and 24 is well adapted for use with coarse products. It includes a sleeve 195, the internal diameter of which is such as to slide easily on the lower portion of the feed hopper, as hereinafter described, and having at its lower portion an enlargement or flange 196, the external diameter of which fits nicely in opening 189 of frame 180; and a series of tufts of bristles 197, which are relatively long but closely spaced. An adjustable abutment 198 may be associated with either stripper brush 181 or 184 as subsequently described. The stripper brush 184 shown in Figure 25 is particularly well adapted for use with small seeds and powder, to prevent flooding the table 54. A skirt 199 extending from the flange 196 at the exterior of the series of bristle tufts 197 holds the bristles more firm and in close relation so as to confine the fluent material to a path within the circumference of the bristle assembly.

The adjustable abutment 198, comprising a divided ring 200, embracing the lower portion of the feed hopper, and having a screw 201 for clamping relation on the lower portion of the feed hopper may well be used where the product tends to flood the table 57. It may be adjusted on the lower part of the hopper so as to hold either of the strippers 181 or 184 snugly against the web portion of the table. These stripper brushes perform the first leveling operations as is obvious from an inspection of the drawings.

The stripper 182 is used for final accurate leveling. It is preferably held in place with its head 202 in opening 187 by set screws 203 passing horizontally thru a portion of flange 188 as shown in Figures 28 and 31. For coarse products this stripper should be raised so that its bristles 204 are spaced slightly from the web portion of the table 54 to prevent its wiping the products out of the measuring units. The hub 185 loosely embraces upstanding annular flange 85 of hub portion 82, and rests upon shoulder 86. Outer flange 194 may also ride on flange 88, as shown in Figures 23 and 24 and if desired, inner flange 193

may ride upon inner annular upstanding flange 87 as shown in Figure 23. The opening 187 is so located in frame 180 as to dispose the brush with its series of bristles in a line diagonally across the path of any surplus material projecting above the upper margin of the cells of the measuring units thus causing any surplus material removed by stripper 182, to find its way adjacent the outer upright walls of flanges 87 and 193. The stripper 183 includes a back 206 having two arms 207 and 208 in right angular relation to one another, the arm 207 being longer than the other arm and hereinafter termed, major and minor arms, respectively, and a curved terminal 209 on minor arm 208 at its end portion opposite its juncture with arm 207. The major arm 207 carries a series of tufts of bristles 210 while the arm 208 and its curved terminal 209 carries a series of tufts of bristles 211, there being a V shown at 212 for the guiding of material into the empty cells. The series of bristles 213 on the curved terminal 209 are preferably diagonally disposed, as shown in Figures 29 and 31, so that when this stripper is in place in recess 190, this series of bristles 213 will bear against and conform to the inner wall of flange 88, tending to direct material on the web portion of the upper table toward the openings or cells of the measuring units. The stripper 183 is preferably disposed loosely in the recess 190 engaging the flange 192 and holds its position due to its own weight and the direction of rotation of the upper table. The stripper 183 serves merely to return excess products to the empty measuring units.

A suitable feed hopper P may comprise an upper cylindrical band 215 with reinforcing ribs 216 and 217 at its top and bottom, respectively, a funnel-like main body portion 218 beneath and secured to band 215, and a hopper spout or tubular neck 219 at its lower portion. It is this hopper spout or tubular neck 219 that may receive the adjustable abutment 198 and the sleeve portion of either stripper 181 or 184, at its exterior. The means Q for supporting the hopper by column 39 and for adjusting the position of the hopper relative to the measure carrier G will now be described. It preferably comprises a bracket 220 including a sleeve portion 221 to embrace the column 39 and provided with a notch 222 open at its lower margin 223, a web or flange 224 laterally of the sleeve portion connecting same with the side of hopper P, as by plate 225 and bolt 226; and, an adjustable abutment 227 carried by the column. A typical example of means for adjusting the position of abutment 227 is shown in Figure 32, where the abutment extends thru the slot 41 in the column and is carried by a bar 228 provided with a longitudinal slot 229, receiving the shank 230 of a bolt 231, with a thumb nut 232 on the end of the bolt opposite its head 233. The shank 230 of the bolt also extends thru the hole 42 in the column, and the head 233 abuts one face of the bar 228. By loosening thumb nut 232, the abutment 227 may be raised or lowered in slot 41. When the sleeve portion 221 of means Q is received on the end of the column, the abutment 227 may be received in the notch 222 thus preventing the bracket 220 from rotating on the column and limited in the extent it may move downwardly on the column, by the location of abutment 227. For nearly all seeds, the hopper may be left at its lowest point. However, for some of the very coarse seeds, smoother operation is obtained when the hopper is further away from the table 54.

Various approved types of mechanisms for agitating products in the hoppers are illustrated and these cover the range of all free and semi-free flowing products.

In Figures 2, 12, 23 and 24, agitating mechanism is shown particularly well adapted for use with very free flowing products, such as seeds. It includes a horizontal rigid frame 235 detachably secured in the hopper, in any suitable manner, preferably to the band 215 and radially thereof. The frame includes a downwardly projecting rib 236 which has integral therewith a downwardly arched casing 237 describing substantially a quarter circle, with a way 238 therein for a flexible section 239 of a drive shaft. The upper opening of way 238 is laterally of the hopper and the lower opening is downwardly in the hopper communicating with a way 240 of a downwardly projecting tube 241 carried rigidly by casing 237. The upper end of shaft section 239 is connected to a pulley 242 while its lower end is connected to a rigid shaft section 243 revoluble in tube 241. This section 243 projects from the bottom of the tube where it is provided with a cross pin 244, a recess 245, an expansion spring 246 in the recess, and a plunger 247 having a head 248 movable in the recess and acting as an abutment for spring 246, and a shank 249 projecting from the end of section 241 as shown in Figure 13. The lower end of shaft section 243 may receive the sleeve portion 250 of a head 251 carrying a finger 252 slightly out of alignment with the axis of sleeve portion 250. In order to detachably hold this assembly to the shaft section 243, the sleeve portion 250 is provided with two bayonet slots 253 open to the upper margin of the sleeve portion, these bayonet slots adapted to receive the ends of pin 244 in the well known manner. The plunger 249 engages the bottom of recess 245 of sleeve portion 250 and the expansion spring 246 is slightly compressed, when pin 244 is at rest in the bayonet slots. This type of agitator finger is particularly well adapted for use where intermittent agitation of delicate or easily broken products, such as edible nuts is desired, or it may be used with continuous agitation for material such as dry seeds. In Figure 14 is shown a modified form of agitator finger, where the lower portion 255 is in obtuse angular relation to a straight portion 256 connected to head 251. This may be substituted for the agitator finger shown in Figure 12, when the hopper feeds to relatively large measuring units. The modification shown in Figure 15 comprising a straight shank portion 257 carried by head 251 and tines 258 at the lower portion of shank 257 is particularly well adapted for use with measuring units having very small cells or chambers, such as the form shown in Figure 24. It works very close to the cups and works the product thereinto more effectively than a single tine or finger agitator.

For more sluggish flowing products like powders, the form of agitating mechanism S shown in Figures 16, 17 and 18 has been found best. It comprises a horizontal frame 260 supporting an upright shaft 261 carrying a worm wheel 262 at its upper end, and a horizontal shaft 263 carrying a worm 264 at its inner end meshing with worm wheel 262, and a pulley 265 at its outer end, the shaft, worm and worm wheel being suitably encased in a grease-proof manner. The lower end of shaft 261 carries a plurality of wire balls 266, each preferably having a horizontal portion 267 and a diagonally and downwardly extending portion 268 terminating in a

vertically disposed portion 269. The portion 268 sweeps close to the inside of the main body 218 of the hopper, while portion 269 sweeps near the inside of spout or neck 219 as shaft 261 revolves.

5 A diagonal rib or brace 270 may connect opposite portions 268, as shown in Figure 18. This type of agitator is particularly well adapted for continuous disturbance of products of that nature apt to pack in the hopper. It prevents merely

10 spasmodic gravity flow of products such as ground spices, pulverized coffee and powders. The balls and brace sweep thru the material continuously slicing same and preventing the arching across the hopper. A rib 271 may be provided at the

15 interior of the funnel-like main body portion 218 of the hopper and is particularly well adapted for use where the product carries some oil such as pulverized coffee apt to lubricate the interior of the hopper and turn as a mass by movement

20 of the agitator unless some barrier to free turning is interposed in its path. It is to be noted that this agitator may operate not only in a zone at and adjacent the delivery end of the hopper, but also upwardly a considerable distance in the

25 hopper.

If continuous agitation in the hopper is desired, the motion transmitting means, including either pulley 242 or 265, may comprise a pulley 272 on shaft L, as shown in Figure 34 and an endless

30 belt 273 trained about the selected pulley. However, where intermittent agitation is of importance so as to prevent constant churning and grinding of the products and to give full agitation only when actually required by gently dis-

35 turbing the product when a measuring unit is below the hopper, the mechanism shown more in detail in Figures 6, 7 and 33 may be used. It comprises a pulley 275 normally free on the end 125 of shaft L, having an outer clutch face

40 276, a clutch member 277 rigid with end 125 of shaft L as by use of set screw carried by its hub 279, the clutch member 277 having a clutch face 280 for cooperation with clutch face 276; a spring

45 281 normally tending to separate clutch faces 276 and 280, being of the expansion type and interposed between pulley 275 and clutch member 277; an expansion spring 282, interposed between an abutment block 283 and pulley 275, this

50 spring being somewhat weaker than spring 281, but tending to move the pulley 275 toward clutch member 277; and, a cam member 284 associated with abutment block 283 and any one of the pins 153 of the selector device as shown more particularly in Figures 6 and 7. This cam member

55 284 has a stem 285 slidably supported by bearing 123 and which is connected to abutment block 283. The cam surface 286 is normally in the path of movement of the one or more pins 153 carried by wheel 152 so that in normal rotation, as indicated by the arrows in Figures 6 and

60 7, the cam member 284 will be moved longitudinally by engagement of the pin shank with the cam surface 286, forcing abutment block 283 toward pulley 275. The compression of spring 282 will overcome the expansive action of spring

65 281 and the clutch faces 276 and 280 will engage, whereupon rotation will be imparted to the pulley 275, and thru the endless belt 273, to the pulley of the agitating mechanism. When only one pin

70 is carried by wheel 152 agitation of material in the hopper takes place only while a measuring unit is at rest beneath the hopper. When two or four pins are used in the wheel 152, as shown in Figures 9 and 11, there is some slight agitation

75 partly during movement of the measuring unit

beneath the hopper and partly during the time it dwells therebeneath. However, this is not objectionable since there is sufficient agitation to fill the measuring units. Using three pins with

5 wheel 152 is satisfactory for a product such as peanuts for it does not matter whether agitation occurs during the dwell or during movement of the measuring units, just so long as agitation is sufficient to prevent arching of the product up

10 in the body of the hopper.

If it is desired to render the mechanism shown in Figures 6, 7 and 33 inactive for intermittent agitation, the set screw 290 carried by abutment block 283 may be turned with its end engaging an abutment 291 on bearing 123 until the clutch

15 faces 276 and 280 are engaged, thus carrying the cam face 286 out of the path of movement of the pin shanks. A lock nut 292 may be provided to hold set screw 290 in its adjusted position.

Spout U may be used for filling envelopes and

20 similar small containers of the bag type. It comprises a frusto-conical body portion 293, the upper horizontal end portion 294 of which is secured to an adapter or filler ring 295 fitting the opening 71 of the lower table. This ring 295

25 has ears 296 perforated to receive screw threaded shanks 297 projecting downwardly from the lower table adjacent the opening 71. These shanks may receive relatively long nuts 298 shown in Figure 3 for clamping the ring 295 in place.

30 The other end of frusto-conical shell 293 is cut at an angle so as to lie in a plane in substantially right angular relation to the horizontal upper plane in which the upper end of the shell is disposed to provide an elliptical shaped deliv-

35 ery opening 299, and a depending lip 299^a. If envelopes, such as for seeds or powders are being filled, the operator holds a pack of envelopes D in the left hand as shown in Figure 2 and moves the pack upward so the lip 299^a enters the upper-

40 most envelope and opens the same. After the discharge of fluent material into the envelope, the pack is lowered and the filled envelope is removed by use of the right hand.

The spout W shown in Figure 4 is particularly

45 well adapted for use in filling square cartons since it has the capacity to take several discharges, thereby preventing the backing up of products onto table 54. It comprises a frusto-pyramidal shell 300, and is disposed with its

50 upper marginal portion 301 spaced a material distance below table 54. A bracket 302 is connected to one side of main body 300 which in turn is mounted upon a rod 303 adjustably carried by a bracket 304 secured to the lug 51, as

55 by pin or screw 305 passing thru the opening 52.

The spout X disclosed in Figure 5 is also well adapted for use when filling containers each of which is to receive a plurality of discharges, and is particularly well adapted for use where the material measured is powder. It is secured to an adapter or filler ring 295 like in the example shown in Figure 3 and comprises a frusto-conical or pyramidal shell portion 306, and a tubular

60 portion 307 therebelow, the lower end of which is cut to lie in an inclined plane as indicated at 308 so as to prevent cutting off egress of fluent material in the spout, in the normal placing of a box or other container therebeneath. In the

65 use of this spout, the product is discharged into the spout and the operator draws the container off the lower portion as it becomes filled. Very little dust is raised in this way because the air in the container is exhausted as the product flows into the spout.

75

A dust-collector 39 is especially desirable when light fluffy powder or other material apt to be dusty is being discharged from the spout. It may comprise a hood 310 secured at its upper end to and about the spout portion 306 as by welding and provided at its open lower end with a hollow-frustum-shaped detachable bottom 311 having a resilient upstanding marginal flange 312 enabling the bottom 311 to be removably secured to the lower end of the hood. An aperture 313 is provided in the reduced upper portion of the frustum-shaped bottom whereby the open end of the product box may be positioned in the dust-retaining chamber 314 of the hood. The tapering formation of the under side of the hollow frustum-shaped bottom acts to guide the product box thru the aperture and into the dust chamber. The frusto-conical or frusto-pyramidal shape of the bottom forms an annular or rectangular channel or valley 315 in which any dust blowing out at the top of the product box will settle.

I claim:

1. In a package filling machine, a frame including a column, a revoluble standard carried at its lower end by said frame, parallel to said column, and with its upper end free of said column, a vertically adjustable support secured to and revoluble with said standard, a plurality of measure units, a carrier for said measure units including a lower table and an upper table encircling and slidable on said standard, said lower table upheld by and rotatable relative to said adjustable support, with the measure units between said lower and upper tables and equidistant from the axis of said standard, a slidable connection detachably coupling said lower table to said column to prevent rotation of the table, and means detachably coupling said upper table to and for rotation with the free end portion of said standard.

2. In a package filling machine, the combination of a revoluble screw threaded standard, a lower table encircling said standard and provided with a discharge opening, a nut-like adjustable support engaging the threads of said standard and said table for holding the table in various adjusted positions on said standard, means detachably securing the lower table against rotation in any of said adjusted positions, an upper table rotatable with said standard above said lower table, having a plurality of openings which may align in succeeding relation with said discharge opening, upper tubular shells carried by said upper table, projecting downwardly from and axially aligned one with each of the openings of the upper table, and lower tubular shells carried by and telescoping said upper tubular shells to form fluent material receiving cells, said lower tubular shells limited in their downward movement by said lower table.

3. In a package filling machine, the combination of a standard, a foot bearing for revolubly and detachably receiving said standard, a lower table encircling said standard and provided with a discharge opening, a vertically adjustable support on said standard engaging said table for holding the table in various vertical adjusted positions on said standard, means detachably securing the lower table against rotation in any of said adjusted positions, an upper table rotatable with said standard above said lower table, having a plurality of openings which may align in succeeding relation with said discharge opening, upper tubular shells carried by said upper table, projecting downwardly from and axially aligned

one with each of the openings of the upper table, and lower tubular shells carried by and telescoping said upper tubular shells to form fluent material receiving cells, said lower tubular shells limited in their downward movement by said lower table.

4. In a package filling machine, the combination of a non-rotatable table provided with an upstanding annular flange and a discharge opening to one side of the axis of said flange, a spider rotatably supported on said table concentric with said flange, a plurality of measure units carried by said spider which align in succeeding relation with said discharge opening as said spider rotates, and scraper fingers carried by said spider, each finger having a leading edge extending from closely adjacent said flange into the path of said measure units above the discharge opening to guide stray fluent material on the table into its discharge opening.

5. In a package filling machine, the combination of a movable table carrying a plurality of measure units having cells open to the upper face thereof, a tubular member spaced above said table thru which fluent material to be measured passes toward said table, said tubular member located with its axis in the path of movement of said measure units, and a stripper brush encircling said tubular member with bristles pointing downwardly toward the table top to guide the material into and substantially level same in said cells.

6. In a package filling machine, the combination of a revoluble table carrying a plurality of measure units having cells open to the upper face thereof, said units spaced equi-distant from the axis of rotation of the table, means for delivering fluent material into the cells one by one as the table revolves, and an elongate brush above said table with its longitudinal axis diagonally across the path of surplus fluent material on said table and projecting above said cells and with the brush end leading in the direction of rotation of the table nearest the axis of rotation of the table, so as to guide the surplus fluent material toward the table center.

7. In a package filling machine, the combination of a revoluble table carrying a plurality of measure units having cells open to the upper face thereof, said units spaced equi-distant from the axis of rotation of the table, means for delivering fluent material into the cells one by one as the table revolves, and an elongate vertically adjustable brush above said table with its longitudinal axis diagonally crosswise the path of surplus fluent material on said table and projecting above said cells, to brush such surplus fluent material to one side and substantially level the fluent material in said cells.

8. In a package filling machine, the combination of a movable table carrying a plurality of measure units having cells open to the upper face thereof, means for delivering fluent material into said cells one by one as the table moves, and a V-shaped stripper brush for moving surplus material carried by the table top into said cells, said brush having its bristles engaging the table top and its apex portion leading in the direction of movement of the table.

9. In a package filling machine, the combination of a revoluble table provided with spaced upstanding flanges located concentric to the axis of rotation of said table with a channel between said flanges, a plurality of measure units having cells open to said channel, means for delivering

fluent material into the cells one by one as the table revolves, and a stripper brush for moving surplus material carried by the bottom of the table channel into said cells, said brush including a brush back carrying a plurality of tufts of bristles in V-shape formation with its apex leading in the direction of rotation of the table and the arms extending toward said flanges, said bristles bearing upon the bottom of the table channel.

10. In a package filling machine, the combination of a revoluble table provided with spaced upstanding flanges located concentric to the axis of rotation of said table with a channel between said flanges, a plurality of measure units having cells open to said channel, means for delivering fluent material into the cells one by one as the table revolves, and a stripper brush for moving surplus material carried by the bottom of the table channel into said cells, said brush including a brush back carrying a plurality of tufts of bristles in V-shape formation with its apex leading in the direction of rotation of the table and the arms extending toward said flanges, said bristles bearing upon the bottom of the table channel, and against the confronting walls of said flanges.

11. In a package filling machine, the combination of a revoluble table provided with spaced upstanding flanges located concentric to the axis of rotation of said table with a channel between said flanges, a plurality of measure units open to said channel, a tubular member spaced above said table thru which fluent material to be measured passes toward said table, said tubular member located with its axis in the path of movement of said measure units, a stripper support adjacent said tubular member having flanges resting upon said flanges of the table and supported thereby as the table rotates, and stripper brushes carried by said stripper support for leveling fluent material in said cells and guiding surplus material resting on the bottom of said channel into said cells.

12. In a package filling machine, the combination of a movable table carrying a plurality of measure units having cells open to the upper face thereof, a tubular member spaced above said table thru which fluent material to be measured passes toward said table, said tubular member located with its axis in the path of movement of said measure units, a stripper brush comprising a sleeve encircling said tubular member and movable up and down thereon, and bristles carried by said sleeve pointing downwardly toward the table top to guide the material into said cells, and an adjustable abutment for limiting upward movement of said stripper brush sleeves on said tubular member.

13. In a package filling machine, the combination of a non-rotatable table having a circular peripheral edge and a discharge opening at one side of the center of said table, a spider rotatably supported on said table concentric with the peripheral edge thereof, a plurality of measure units carried by said spider which align in succeeding relation with said discharge opening as said spider rotates, and scraper fingers carried by said spider, each finger having a leading edge extending from adjacent said peripheral edge into the path of said measure units above the discharge opening to guide stray fluent material on the table into the discharge opening.

14. In a package filling machine, the combination of a movable table carrying a plurality of

measure units having cells open to the upper face thereof, a tubular member spaced above said table thru which fluent material to be measured passes toward said table, said tubular member located with its axis in the path of movement of said measure units, and a stripper brush including a sleeve portion encircling said tubular member, a sleeve-like flexible brushing portion projecting downwardly toward the table top to guide the material into and substantially level same in said cells, and an outer skirt portion projecting below said sleeve portion and closely encircling said brushing portion whereby to confine the fluent material within the sleeve-like brushing portion.

15. In a package filling machine, the combination of a revoluble table carrying a plurality of measure units open to the upper face thereof and adapted to move the measure units along a circular path as the table revolves, means positioned along said path for delivering fluent material to said units, means positioned further along said path for diverting any surplus fluent material from said units, means positioned still further along said path for discharging the remaining fluent material from said units, and means positioned between said last and first-named means for returning the surplus fluent material to the empty units.

16. A package filling machine comprising, in combination, a movable table, a plurality of measure units carried by the table and open to the upper face thereof, said table being adapted to move the measure units one after another along an endless path, means positioned over a certain zone of said path for delivering successive charges of fluent material to said units, means positioned over a second zone further along said path for leveling said charge and diverting any surplus material from said units, means positioned at a third zone still further along said path for successively discharging the leveled charges from said units, and means positioned in a fourth zone still further along said path between said discharging means and said charge-delivering means for returning the surplus fluent material to said units prior to refilling thereof by said charge-delivering means.

17. In a package filling machine, a frame including a column, a revoluble standard carried by the frame, a vertically adjustable lower table carried by and encircling the standard, and provided with a discharge opening, a connection between the lower table and the column to prevent rotation of the lower table, an upper table thereabove, encircling and rotatable with the standard, and having a plurality of openings which may align in succeeding relation with said discharge opening, a horizontal spider bearing upon the lower table, encircling and free of said standard, and provided with a plurality of upwardly projecting sleeves, corresponding in number to and axially aligned with the openings of the upper table, a lower tubular shell detachably carried by and projecting upwardly from each of said sleeves, and an upper tubular shell carried by said upper table, projecting downwardly from and axially aligned with each of the openings of the upper table, the said shells of aligned spider sleeves and upper table openings in telescopic relation and the spider propelled about the lower table by rotation of the upper table thru said shells.

18. In a package filling machine, a frame, a hopper including a spout, an agitator at least partially extending into said spout, a revoluble

standard carried by the frame, a plurality of measure units each including upper and lower telescopic sections, a measure carrier for moving said measure units comprising an upper table for supporting the upper sections, fixed to rotate with the standard in a horizontal plane at a fixed distance below said agitator, and a lower vertically adjustable stationary table beneath the upper table for supporting the lower sections, a shaft carried by the frame, motion transmitting means operatively connecting said agitator and shaft for actuating the former from the latter, and motion transmitting means operatively connecting said measure carrier standard and shaft for actuating the measure carrier from the shaft.

19. In a package filling machine, a frame, a hopper including a spout, an agitator at least partially extending into said spout, a revoluble standard carried by the frame, a plurality of measure units each including an upper and a lower telescopically adjustable section, a measure carrier for said measure units comprising an upper table supporting the upper sections, fixed to rotate with the standard in a horizontal plane at a fixed distance below said agitator, and a lower vertically adjustable stationary table beneath the upper table and supporting the lower sections, a discharge spout, a prime mover, motion transmitting means operatively connecting said prime mover and revoluble standard so constructed and arranged as to cause the measure units to dwell, one by one, for a period of time beneath said hopper spout in their travel to the discharge spout, and motion transmitting means operatively connecting said prime mover and agitator for operating the latter particularly when there is a measure unit dwelling beneath the hopper spout.

20. In a package filling machine, the combination of a prime mover, a frame, a hopper including a spout, an agitator extending at least partially into said spout, a revoluble standard carried by the frame, a discharge spout, a plurality

of telescopically adjustable measure units, a measure carrier for said measure units including an upper table fixed to rotate with the standard in a horizontal plane at a fixed distance below said agitator, and a lower stationary table beneath the upper table and movable axially of the standard for adjusting the measure units, a driven shaft operated by said prime mover, motion transmitting means operatively connecting said shaft and measure carrier standard so constructed and arranged as to move the measure units one by one from said hopper spout to said discharge spout, and motion transmitting means operatively connecting said shaft and agitator for intermittently operating the latter.

21. In a package filling machine, the combination of a prime mover, a frame, a hopper including a spout, an agitator at least partially extending into said spout, a revoluble standard carried by the frame, a discharge spout, a plurality of telescopically adjustable measure units, a measure carrier for said measure units including an upper table fixed to rotate with the standard in a horizontal plane at a fixed distance below said hopper spout and a lower stationary table beneath the upper table and movable along the standard toward and away from the upper table for adjusting the measure units, motion transmitting means operatively connecting said prime mover and measure carrier standard, including a lost motion device to cause the measure units to dwell one by one for a period of time beneath said hopper spout in their travel to the discharge spout, and motion transmitting means operatively connecting said prime mover and agitator including a clutch and means operable by said first mentioned motion transmitting means to engage the clutch during approximately the period a measure carrier dwells beneath the hopper spout and release the clutch during substantially the period when no measure unit is beneath the hopper spout.

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