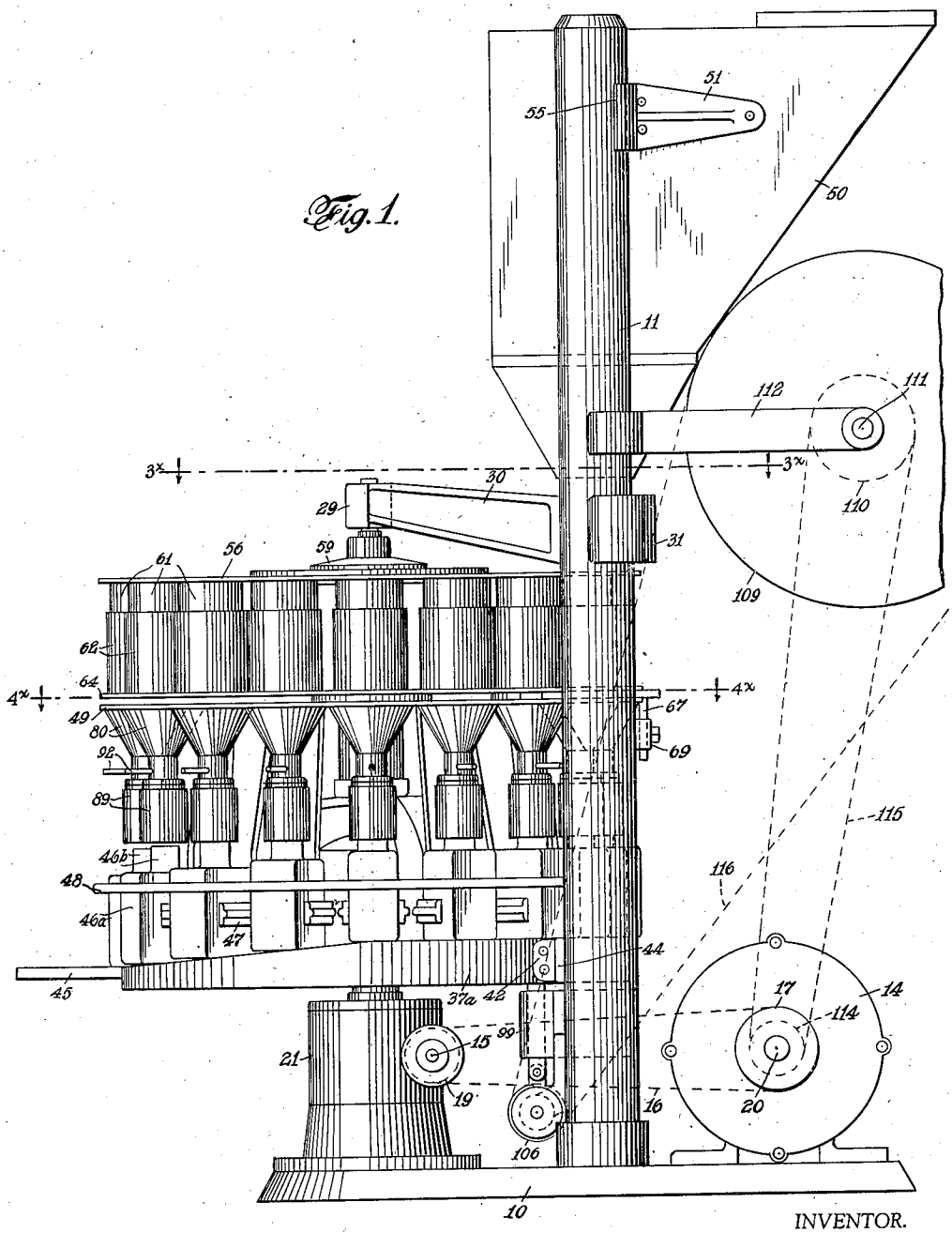
May 2, 1939. W. J. BECK 2,156,271

AUTOMATIC FILLING MACHINE

Filed Dec. 14, 1936 4 Sheets-Sheet 1

Fig. 1.



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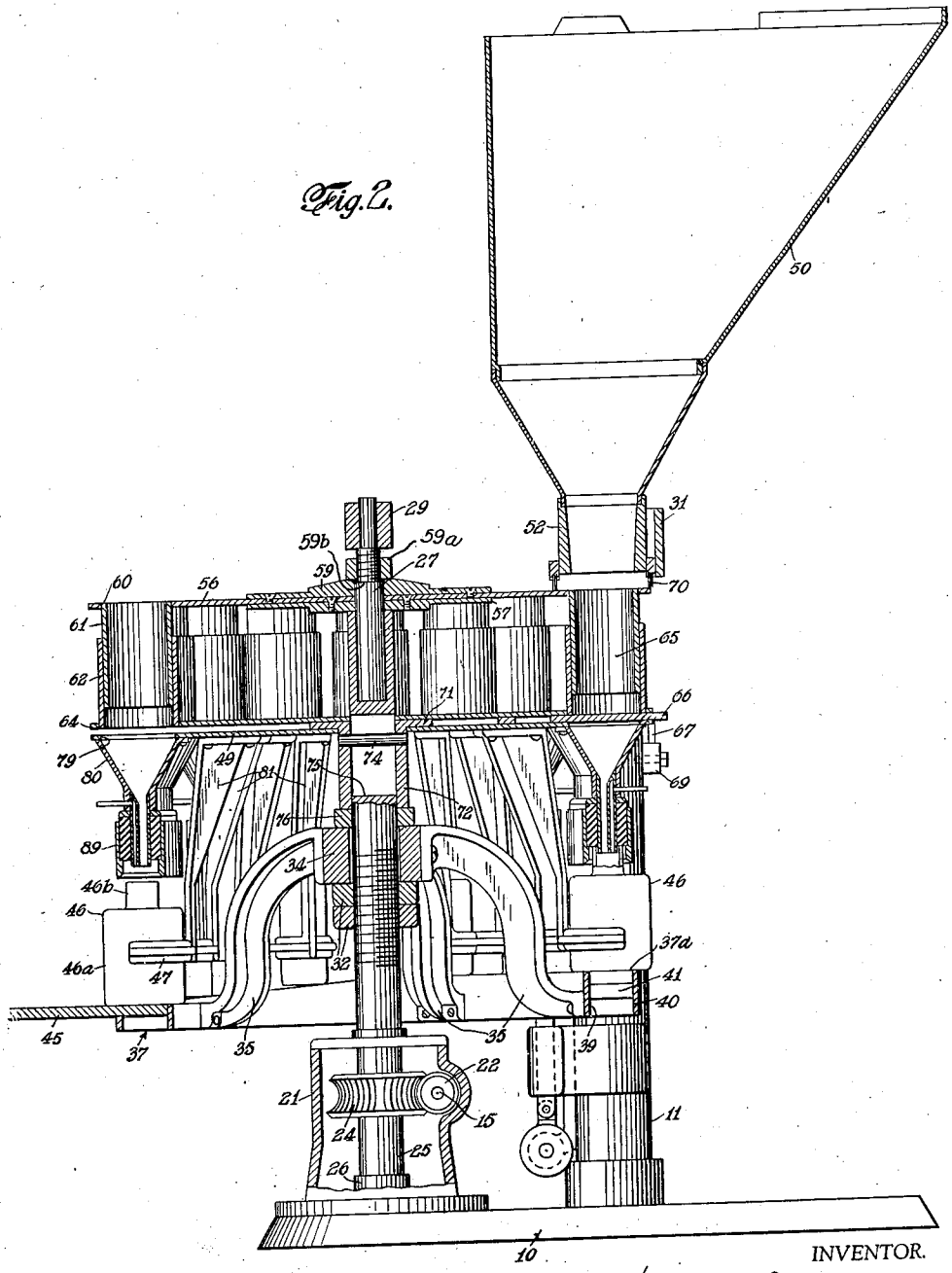
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AUTOMATIC FILLING MACHINE

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Fig. 2.



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May 2, 1939. W. J. BECK 2,156,271

AUTOMATIC FILLING MACHINE

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Fig. 3.

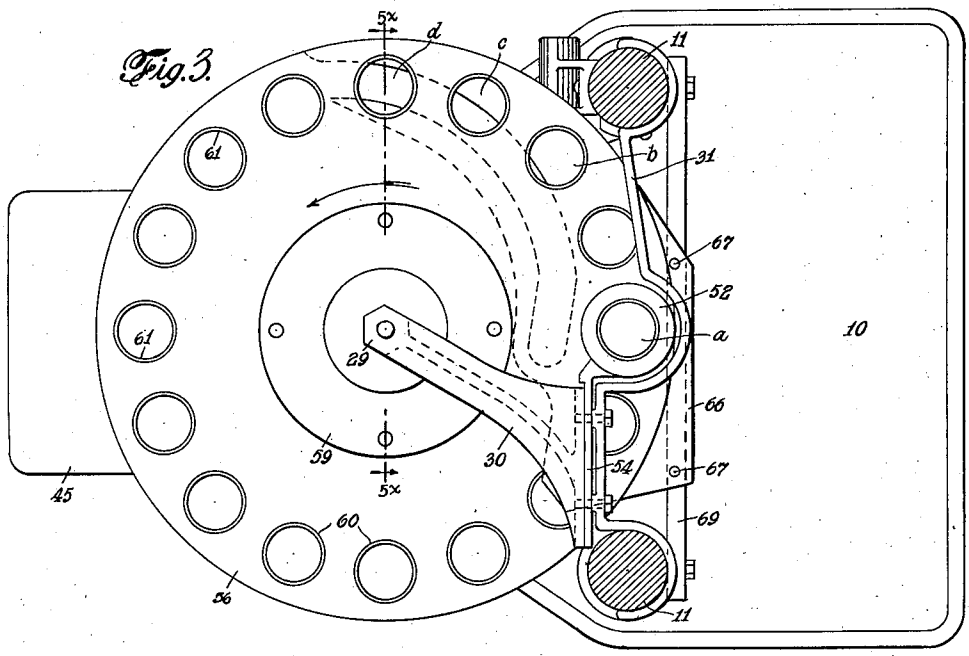
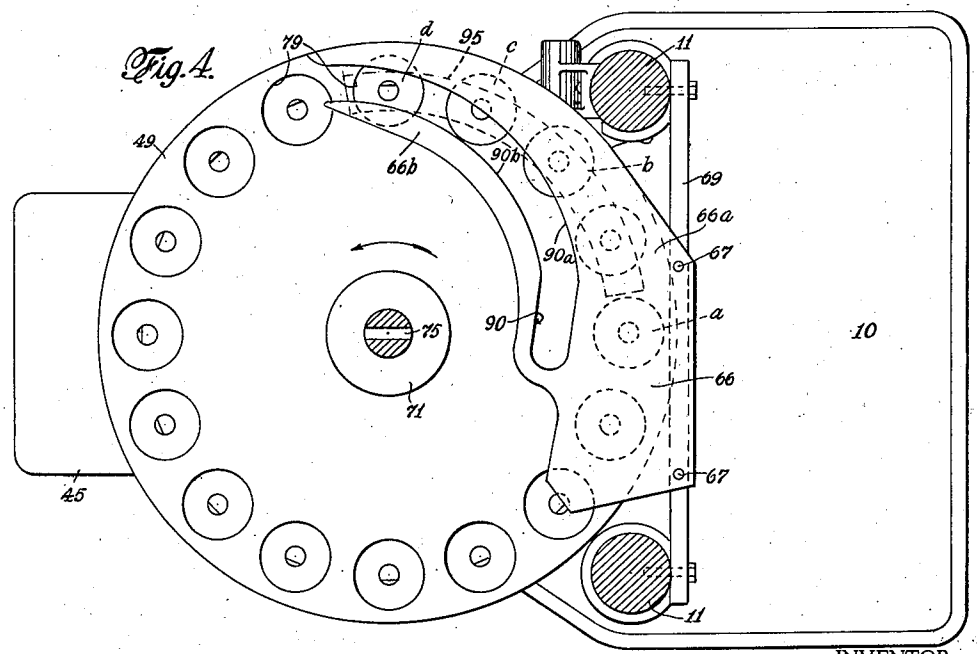


Fig. 4.



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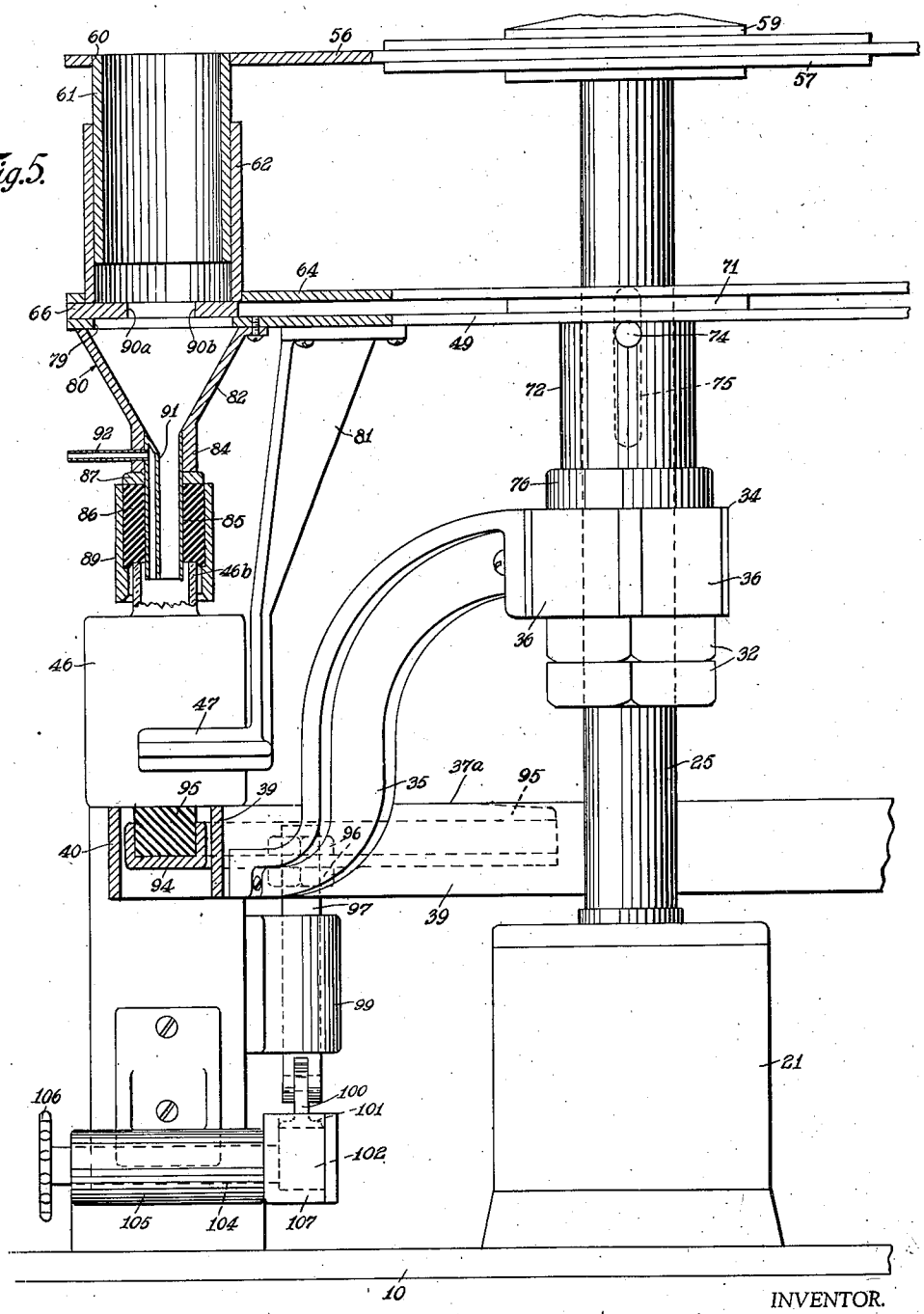
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May 2, 1939. W. J. BECK 2,156,271

AUTOMATIC FILLING MACHINE

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Fig. 5.



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Patented May 2, 1939 2,156,271

UNITED STATES PATENT OFFICE

2,156,271

AUTOMATIC FILLING MACHINE

William J. Beck, Yonkers, N. Y.

Application December 14, 1936, Serial No. 115,651

20 Claims. (Cl. 226—98)

The present invention relates generally to automatic filling machines, and has particular reference to machines designed to introduce in predetermined amounts material in powder form into bottles or other containers.

As heretofore practiced, many difficulties have been encountered in the automatic filling of such containers with powdered materials, particularly materials tending to increase in volume by reason of aeration, as upon being poured into a container, such as tooth powders, perborates, pyrethrum powder or other similarly acting pulverized, powdered or granular materials, due to the fact that the material tended to occupy a substantially larger volume when initially filled before settling or deaeration.

In these automatic filling procedures, the powdered or pulverized material was first measured off volumetrically in a moving or rotating series of measuring chambers or vessels and then these chambers or vessels were dumped into the final containers in which the materials were sold or merchandised. To take care of the excessive volume occupied when the material was first dumped into said chambers or vessels, it was necessary to utilize overflow sleeves which were removed only when the material had settled to its normal volume.

The principal object of the invention is to provide an improved filling machine in which powdered, pulverized or granular materials of the character above described may be dispensed into containers, bottles and so forth without difficulty due to aeration or increase in volume when being filled and without the necessity of utilizing overflow sleeves.

In accomplishing this object it has been found suitable to cause filling of the material into a container progressively or gradually in such a manner that the material is settled as rapidly as it enters the container.

In one embodiment of the present invention, the chambers or vessels were gradually opened into the final containers so that the material would quickly assume its final volume.

The above and other objects of the invention will more fully appear from the following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a side view of a machine, illustrating an embodiment of the invention;

Fig. 2 is a similar view of the machine in central section, with the motor and other driving mechanism removed;

Fig. 3 is a fragmentary view taken on the line 3×—3× of Fig. 1;

Fig. 4 is a similar view taken on the line 4×—4× of Fig. 1; and

Fig. 5 is an enlarged sectional view taken on the line 5×—5× of Fig. 3, with some of the parts removed.

The machine illustrated in the drawings comprises a base 10 having two spaced standards or uprights 11 secured thereto. As shown in Fig. 1, on the base 10 is mounted a motor 14, which drives a horizontal shaft 15 through the medium of a chain 16 engaging sprocket wheels 17 and 19, mounted respectively on the motor shaft 20 and shaft 15. The latter extends from a gear housing 21 by which it is rotatably supported in any suitable manner and wherein it carries a worm 22 in mesh with a gear 24 on a vertical shaft 25, as shown in Fig. 2. A suitable ball-bearing 26, not shown in detail, is provided for the lower end of the shaft 25, which extends through the top of the housing 21 and is bored out at its upper end to receive a smaller shaft 27 rotatable therewith and having a reduced portion journalled into a bearing-member 29. As best shown in Fig. 3, the end 29 of the cross-piece 30 serves as a bearing-member. The cross-piece 30 is secured to a supporting cross-bar 31 rigidly attached at its ends to the uprights 11.

Referring now to Figs. 2 and 5, it will be seen that on the central portion of the shaft 25 and loosely carried by lock-nuts 32 screw-threaded thereon is a supporting frame structure comprising a central member 34, apertured for the passage of the shaft 25, and having radial arms 35 secured at their inner ends to the side faces 36 (Fig. 5) of the member 34. The arms 35 extend downwardly from the member 34 and at their outer ends are attached to an outer circular track 37 consisting of concentric bands 39 and 40, united to one another through suitable spacing bars 41. Only one of the bars 41 is shown (Fig. 2), it being understood that they are disposed at suitable arcuate intervals between the two bands 39 and 40. The track 37 is prevented from rotating by brackets 42 secured to the outer band 40 with their arcuate extensions 44 respectively slidably embracing the two uprights 11, only one of these brackets 42 being illustrated (Fig. 1).

The track 37 is provided with a front shelf 45 from which the containers 46 to be filled by the machine may be individually positioned by the operator into revolving forks 47, the latter being supported from a circular plate 49 rotatable with the shaft 25, as will hereinafter

appear. Chains, belts or other conveyors might be employed to move the containers toward and away from said forks.

The track 37 has a rear portion 37a of higher level than the shelf 45, the bands 39 and 40 being each tapered upwardly on either side of the shelf 45 toward said high rear portion 37a. Thus the containers 46 by their rotary movement on the track 37 in the forks 47 are first raised from the shelf 45 to an uppermost position on the high portion 37a, maintained in this uppermost position while on the high portion 37a, and thereafter lowered from the high portion 37a back on to the shelf 45. A guide rail 48 is provided for retaining the containers 46 on the track 37 during their travel thereon.

The containers 46 are shown as small bottles having oval bodies 46a terminating in neck portions 46b of considerably reduced cross-section, the forks 47 being adapted to conform to their body portions 46a. As will hereinafter be described, these bottles 46 are filled with a predetermined amount of powdered material while in their raised position on the track portion 37a, the filled bottles being removed from the machine upon their return by the forks 47 on to the shelf 45.

Referring to Figs. 1, 2 and 3, a feed-chamber or feed-hopper 50, secured or bolted to uprights 11 by brackets 51, is removably carried by an annular member 52 formed integrally with a cross-piece 54 secured with the cross-piece 30 to the supporting bar 31. Only one of the guide-members 51 is illustrated (Fig. 1), it being understood that they are respectively secured to the two sides of the hopper 50 with their arcuate extensions 55 embracing the two uprights 11. The hopper 50 serves to supply the powdered material to be introduced into the bottles 46.

A circular plate member 56 is carried by the upper end of the shaft 25 between two discs or clamping members 57 and 59, the nut 59a holding these members on the shaft 27. The shoulder 59b limits the amount of tightening. The plate 56 contains a circular row of openings 60 (Fig. 3), into which tubes 61 are rigidly fitted at their upper edges. The tubes 61 extend downwardly into an equal number of tubes 62 slidingly engaging therewith and rigidly fitted at their lower edges into openings formed in a lower plate 64 in axial alignment with the openings 60, the plate 64 and the plate 49 below it being vertically adjustable on the shaft 25 by means of the lock-nuts 32, as will be hereinafter more particularly described.

The openings 60 in the uppermost plate 56 are adapted to successively register with the annular member 52 at the bottom of the hopper 50 during rotation of the shaft 25, so that the telescoping tubes 61 and 62 provide individual chambers 65 into which powdered material from the hopper 50 may discharge during operation of the machine. The plate 64 rotates on a flat member or plate 66 interposed between the two plates 49 and 64 and vertically adjustable therewith. Vertical movement of the plate 66 is permitted by pins 67 extending downwardly from its rear edge and slidably engaging into openings formed in a cross-bar 69 rigidly attached at its ends to the uprights 11 (Fig. 4). The plate 66 thus remains fixed during operation of the machine and provides a bottom closure for the chambers 65 as they rotate in turn below the member 52. To prevent any grinding effects between the hopper member 52 and the upper plate 56, the member 52 is preferably spaced from the plate 56 and provided with bristles, felt, leather or other wiper constructions 70 annularly disposed at its bottom in wiping contact with the plate 56 (Fig. 2). The chambers 65 are thus filled with powdered material from the hopper 50 during their passage below the member 52, their entire contents being subsequently individually discharged into the bottles 46 fed through the machine, as will hereinafter appear. The plate 66 constitutes one of the important elements provided by the invention and its construction will be hereinafter more particularly described.

Interposed between the two plates 49 and 64 and secured thereto is a central spacing element 71 (Fig. 2), of the same thickness as the plate 66 and apertured for the passage of the shaft 25. This element 71 is formed with a downward sleeve 72, which is slidably keyed to the shaft 25 by means of a pin 74 extending through a slot 75 therein (Figs. 2, 4 and 5) and is carried on an annular member 76 loosely surrounding the shaft 25 and resting on the central frame member 34. From the foregoing description it is apparent that by adjusting the position of the lock-nuts 32 on the shaft 25, all of the parts carried by the frame member 34, which parts include the track 37 carrying the shelf 45 and the plates 49 and 64, the latter carrying the tubes 62, will likewise be adjusted in position.

Like the plate 64, the plate 49 is formed with openings 79 (Fig. 4) in axial alignment with the openings 60. In registry with these openings 79 funnels or cylinders 80 are rigidly secured to the plate 49 at their upper edges. Brackets 81, with which the forks 47 previously mentioned are integrally formed, also extend from the plate 49 to which they are secured. These brackets 81 are equal in number to the funnels 80 and are radially aligned therewith, so that the bottles 46 may be positioned in the forks 47 directly beneath the funnels 80 in axial alignment therewith. The funnels 80 thus serve to guide the material discharged from the chambers 65 into the bottles 46, which are positioned under the funnels by the forks 47. The chambers 65, funnels 80 and forks 47 are obviously all caused to rotate with the shaft 25.

As best shown in Fig. 5, the funnels or cylinders 80 each comprise a hollow conical member 82 terminating at its lower end in an annular extension 84 and a lower pipe or discharge conduit 85 rigidly fitted into the extension 84. Each of the pipes 85 extends through and projects downwardly a certain distance beyond an annular cushion 86 of yielding material, such as sponge rubber, which is frictionally held in place against an upper washer 87 by means of an outer jacket or protecting ring 89, the latter extending a certain distance below the cushion 86. During upward movement of the bottles 46 from the shelf 45 their neck portions 46b enter the outer rings 89 and the upper edges of said portions 46b firmly contact with the cushions 86 with the pipes 85 extending into the bottle necks during rotary movement on the high portion 37a of the track. In this manner the bottles 46 are effectively held against movement relative to the rotary parts and waste of material prevented during the filling operation to be hereinafter described. Obviously, as the bottles move off from the high portion 37a on to the shelf 45, their neck portions 46b move out of the rings 89, thereby permitting removal of the filled bottles from the shelf 45.

Referring particularly to Figs. 3 and 4, the plate

66 is provided with a slot 90 arcuately formed therein, both the outer and inner edges 90a and 90b respectively of which serve important functions to be presently described. Observing the direction of rotation indicated by the arrows in these figures, each of the openings 79 in the plate 49 is covered by the outer portion 66a of the plate 66 during passage through the position a indicated, corresponding to which position the chambers 65 are successively positioned in axial alignment with the hopper member 52. That is, each of the openings 79 in the plate 49 is covered by said portion 66a during introduction of material from the hopper 50 into the corresponding chamber 65, which likewise applies to the corresponding opening in the plate 64. During further movement, however, the openings 79 in the plate 49 are each progressively uncovered by cross-movement relative to the slot edge 90a, as illustrated by the positions b, c and d, which they each successively assume, each of the openings in the plate 64 in like manner being uncovered simultaneously with the corresponding opening 79. It is thus apparent that the material introduced into the chambers 65 during their travel below the hopper member 52 will cascade over the gradually retreating edge 90a of the plate portion 66a into the funnels 80, because of which it will be introduced in a small and uniform stream into the bottles 46, then rotating in their uppermost position on the high portion 37a of the track, as already stated. By reason of this manner of discharge into the funnels no clogging of the material whatever in its descent through the funnel pipes 85 is possible, all material discharged into the funnels 80 being introduced into the bottles 46. It is also noted that the openings 79 in the plate 49 each pass in part below the inner portion 66b of the plate 66, as illustrated by the position d which they assume slightly before clearing the outer portion 66a. That is, each of the openings 79 in the plate 49 is in part progressively covered by cross-movement relative to the slot edge 90b, the width of the slot 90 being such that the inner edge 90b starts to cover an opening 79 only after it has in large part been uncovered by the outer edge 90a. The inner edge 90b thus serves as a scraper, material deposited on the plate 49 during discharge from the chambers 65 being forced off into the openings 79. Since the falling of material on the plate 49 is more likely to occur at the start of discharge from the chambers 65 (at about position b), which results in an accumulation of deposited material near the inner edges of the openings 79, it is apparent that each of the piles of deposited material is scraped into the opening 79 adjacent thereto by its rotary travel in contact with the inner slot edge 90b. By the slot construction illustrated it has been found in practice that substantially the entire content of material originally present in each of the chambers 65 is introduced into the bottle 46 below it, waste in material being entirely prevented.

From the foregoing description it is apparent that the volumetric capacity of the chambers 65 determines the amount of the material introduced into the bottles 46. Thus by adjusting the position of the lock-nuts 32 on the shaft 25, this amount may be regulated at will, any adjustment obviously adapting all parts of the machine for proper operation because of the vertical movement of the various parts carried by the central frame member 34.

Referring particularly to Fig. 5, each of the funnel pipes 85 is provided with an inner wall or partition 91 secured at its side and upper edges to the inner surface thereof, the space confined by this partition 91 communicating with an exterior vent pipe 92 extending through the extension 84. During the filling operation which has been described, air displaced from the bottles 46 as material is discharged therein may thus escape through the passages provided by the partitions 91 and pipes 92 associated therewith.

A means to be presently described may be employed for vibrating the bottles 46 during the filling operation if desired, but is customarily omitted in the present invention.

Referring to Fig. 5, a curved channel 94 disposed between the two bands 39 and 40 within the high portion 37a of the track has mounted therein a block or pad 95 of yielding material, such as rubber, which pad 95 is arranged to contact with the bottom of the bottles 46 during their travel across it. The lower wall of the channel 94 is firmly held between two nuts 96 on the upper threaded portion of a vertical rod 97 slidably mounted in a guide-member 99 rigidly attached to one of the uprights 11, the rod 97 being pivotally connected at its lower end to a link-member 100 having a base 101 adapted to cooperate with an eccentric 102 mounted at one end of a shaft 104 journalled in a bearing-member 105, also rigidly attached to the same upright 11. The shaft 104 at its other end carries a sprocket wheel 106 by means of which it is rotated, the eccentric 102 being adapted to operate in a housing 107 apertured at its top for passage of the link base 101. To provide the proper speed of rotation of the shaft 104, sprocket wheels 109 and 110 (Fig. 1) of relatively large and small diameters are mounted on a shaft 111 rotatably supported by an upper frame 112 rigidly attached at the rear of the machine to the two uprights 11. A second sprocket wheel 114 is mounted on the motor shaft 20, which drives the shaft 111 through the medium of a chain 115 engaging the wheels 114 and 110, the shaft 105 being driven through the medium of a chain 116 engaging the wheels 109 and 106. From the eccentric 102, vibration is imparted to the channel 94 through the medium of the rod 97 and link 100. Because of the resiliency of the pad 95 and upper cushions 86, vibration is communicated to the bottles 46 as they pass over the pad 95, which is so dimensioned and so located below the plate 66 that this vibration is communicated to the bottles during the entire period of actual filling. The material introduced into the bottles 46 is thus effectively compacted and caused to assume its proper volume.

From the foregoing it is apparent that the embodiment described is a filling machine satisfying the various objects of the invention. It is of course understood that the invention is not limited to this particular embodiment and that various modifications of the latter are contemplated within the purview of the appended claims.

What is claimed is:

1. In a machine for introducing powdered material into containers, a chamber from which the material is discharged, guiding means below said chamber for directing the material into the containers, and slotted closure means interposed between said chamber and guiding means and relatively movable thereto for progressively discharging the material from said chamber into said guiding means, said closure means being

provided with an eccentrically disposed slot, said guiding means being provided with inlet openings to receive material from said chamber, the slot in said closure means extending obliquely across the path of said inlet openings so as to progressively uncover more of the area of said inlet openings as said guiding means are moved in the direction to cause said progressive discharge.

2. In a machine for introducing powdered material into containers of reduced neck portion, a chamber from which the material is discharged, guiding means below said chamber adapted to extend into the neck portion of the containers for directing the material therein, and closure means interposed between said chamber and guiding means and relatively movable thereto for progressively discharging the material from said chamber into said guiding means, said guiding means being provided with a passage for escape of air from the containers, said closure means being provided with an eccentrically disposed slot, said guiding means being provided with inlet openings to receive material from said chamber, the slot in said closure means extending obliquely across the path of said inlet openings so as to progressively uncover more of the area of said inlet openings as said guiding means are moved in the direction to cause said progressive discharge.

3. In a machine for introducing powdered material into containers, a chamber from which the material is discharged, guiding means below said chamber for directing the material into the containers, closure means between said chamber and guiding means and relatively movable thereto for progressively discharging the material from said chamber into said guiding means, and sealing means associated with said guiding means for sealing the containers at their inlet end against escape of material, said guiding means being provided with a passage for escape of air from the containers and also being provided with a collar containing a flexible gasket at its outlet end, said sealing means including means for elevating said containers to press the upper ends thereof against said gasket, said closure means being provided with an eccentrically disposed slot, said guiding means being provided with inlet openings to receive material from said chamber, the slot in said closure means extending obliquely across the path of said inlet openings so as to progressively uncover more of the area of said inlet openings as said guiding means are moved in the direction to cause said progressive discharge.

4. In a machine for introducing powdered material into containers, a chamber from which the material is discharged, guiding means below said chamber for directing the material into the containers, closure means between said chamber and guiding means and relatively movable thereto for progressively discharging the material from said chamber into said guiding means, a track for carrying said containers, said track being elevated at the positions where said containers are to receive said powdered material, an arcuate contact member in said track contacting said containers, and means for vibrating said arcuate contact member to settle the material received in the containers, said closure means being provided with an eccentrically disposed slot, said guiding means being provided with inlet openings to receive material from said chamber, the slot in said closure means extending obliquely across the path of said inlet openings so as to progressively uncover more of the area of said inlet openings as said guiding means are moved in the direction to cause said progressive discharge.

5. In a machine for introducing powdered material into containers, a chamber from which the material is discharged, guiding means below said chamber for directing the material into the containers, closure means between said chamber and guiding means and relatively movable thereto for progressively discharging the material from said chamber into said guiding means, rubber gasket means associated with said guiding means for resiliently sealing the containers at their inlet ends against escape of material and means for elevating the inlet ends of said containers against said gasket, said guiding means being provided with a passage for escape of air from the containers, and means for vibrating the containers, said closure means being provided with an eccentrically disposed slot, said guiding means being provided with inlet openings to receive material from said chamber, the slot in said closure means extending obliquely across the path of said inlet openings so as to progressively uncover more of the area of said inlet openings as said guiding means are moved in the direction to cause said progressive discharge.

6. In a machine for introducing powdered material into containers of reduced neck portion, a chamber from which the material is discharged, guiding means below said chamber adapted to extend into the neck portion of the containers for directing the material therein, closure means interposed between said chamber and guiding means and relatively movable thereto for progressively discharging the material from said chamber into said guiding means, rubber gasket means associated with said guiding means for resiliently sealing the neck portion of the containers at their inlet end against escape of material, means for elevating said containers so that their neck portions will contact with said rubber gasket means and means for vibrating the containers, said closure means being provided with an eccentrically disposed slot, said guiding means being provided with inlet openings to receive material from said chamber, the slot in said closure means extending obliquely across the path of said inlet openings so as to progressively uncover more of the area of said inlet openings as said guiding means are moved in the direction to cause said progressive discharge.

7. In a machine for introducing powdered material into containers, a chamber from which the material is discharged, the columetric capacity of said chamber determining the amount of the material introduced into the containers, guiding means below said chamber for directing the material into the containers, closure means provided with a curved parallelly edged slot and interposed between said chamber and guiding means relatively movable thereto for progressively discharging the material from said chamber into said guiding means, and means for varying the volumetric capacity of said chamber, said slot being eccentrically disposed, said guiding means being provided with inlet openings to receive material from said chamber, the slot in said closure means extending obliquely across the path of said inlet openings so as to progressively uncover more of the area of said inlet openings as said guiding means are moved in

the direction to cause said progressive discharge.

8. In a machine for introducing powdered material into containers, telescoping tubes forming a chamber from which the material is discharged, the volumetric capacity of said chamber determining the amount of the material introduced into the containers, guiding means below said chamber for directing the material into the containers, closure means provided with a curved parallelly edged slot and interposed between said chamber and guiding means and relatively movable thereto for progressively discharging the material from said chamber into said guiding means, and means for adjusting the relative positions of said tubes to vary the volumetric capacity of said chamber, said slot being eccentrically disposed, said guiding means being provided with inlet openings to receive material from said chamber, the slot in said closure means extending obliquely across the path of said inlet openings so as to progressively uncover more of the area of said inlet openings as said guiding means are moved in the direction to cause said progressive discharge.

9. In a machine for introducing powdered material into containers, upper and lower vertical tubes telescoping one in the other and forming a chamber from which the material is discharged the volumetric capacity of said chamber determining the amount of the material introduced into the containers, guiding means below said chamber for directing the material into the containers, closure means having a curved slot opening extending obliquely across the tops of said containers and interposed between said chamber and guiding means and relatively horizontally movable thereto for progressively discharging the material into said guiding means, means for supporting the containers in position to cooperate with said guiding means, and means for vertically adjusting the position of the lower tube relative to the upper tube to vary the volumetric capacity of said chamber, said adjusting means also effecting vertical adjustment in the position of said guiding means, closure means and supporting means.

10. In a machine for introducing powdered material into containers, a chamber from which it is discharged, guiding means below said chamber for directing the material into the containers, and closure means having a curved slot opening extending obliquely across the tops of said containers and interposed between said chamber and guiding means and relatively laterally movable thereto, said closure means being provided with an edge adapted by the relative movement to periodically progressively uncover the bottom of said chamber thereby causing the material to be periodically progressively discharged into said guiding means.

11. In a machine for introducing powdered material into containers, a chamber adapted to be periodically charged with the material, guiding means below said chamber for directing the material therefrom into the containers, and curved slotted closure means interposed between said chamber and guiding means and relatively laterally movable thereto, said slot being provided with parallel edges adapted by the relative movement to progressively uncover the bottom of said chamber subsequent to each periodic charge of the material into said chamber thereof causing each periodic charge to be progressively discharged into said guiding means.

12. In a machine for introducing powdered material into containers, an upper plate carrying a chamber from which it is discharged, a lower plate carrying guiding means below said chamber for directing the material into the containers, and curved slotted closure means interposed between said two plates and relatively slidably movable thereto, said closure means being provided with a slot having an edge adapted by the relative movement to periodically progressively uncover the bottom of the chamber thereby causing the material to be periodically progressively discharged into said guiding means, said slot being also provided with another parallel edge adapted by the relative movement to periodically scrape material deposited on the lower plate into said guiding means.

13. In a machine for introducing powdered material into containers, an upper plate carrying a chamber adapted to be periodically charged with the material, a lower plate carrying guiding means below said chamber for directing the material therefrom into the containers, and curved slotted closure means interposed between said two plates and relatively slidably movable thereto, said closure means being provided with a slot having an edge adapted by the relative movement to progressively uncover the bottom of said chamber subsequent to each periodic charge of the material into said chamber thereby causing each periodic charge to be progressively discharged into said guiding means, said slot being also provided with another parallel edge adapted by the relative movement to periodically scrape material deposited on the lower plate into said guiding means.

14. In a machine for introducing powdered material into containers, an upper plate carrying a chamber adapted to be periodically charged with the material, a lower plate carrying guiding means below said chamber for directing the material therefrom into the containers, and a flat closure member interposed between said two plates and relatively slidably movable thereto, said member being provided with a slot one edge of which is adapted by the relative movement to progressively uncover the bottom of said chamber subsequent to each periodic charge of the material into said chamber thereby causing each periodic charge to be progressively discharged into said guiding means and the other edge of which is adapted by the relative movement to scrape material deposited on the lower plate into said guiding means during each periodic discharge of the material into said guiding means.

15. In a machine for introducing powdered material into containers, a chamber adapted to be periodically charged with the material, guiding means below said chamber for directing the material therefrom into the containers, and closure means interposed between said chamber and guiding means and relatively rotatable thereto, said closure means being provided with parallel curved edges adapted by the relative rotation to progressively uncover the bottom of said chamber subsequent to each periodic charge of the material into said chamber thereby causing each periodic charge to be progressively discharged into said guiding means.

16. In a machine for introducing powdered material into containers, an upper plate carrying a chamber adapted to be periodically charged with the material, a lower plate carrying guiding means below said chamber for directing the ma-

terial therefrom into the containers, and a flat closure member interposed between said two plates and relatively slidable rotatable thereto, said member being provided with a curved edge adapted by the relative rotation to progressively uncover the bottom of said chamber subsequent to each periodic charge of the material into said chamber thereby causing each periodic charge to be progressively discharged into said guiding means, said member being provided with another curved edge adapted by the relative rotation to periodically scrape material deposited on the lower plate into said guiding means.

17. In a machine for introducing powdered material into containers, an upper plate carrying a chamber adapted to be periodically charged with the material, a lower plate carrying guiding means below said chamber for directing the material therefrom into the containers, and a flat closure member interposed between said two plates and relatively slidably rotatable thereto, said member being provided with a curved slot the outer edge of which is adapted by the relative rotation to progressively uncover the bottom of said chamber subsequent to each periodic charge of the material into said chamber thereby causing each periodic charge to be progressively discharged into said guiding means and the inner edge of which is adapted by the relative rotation to scrape material deposited on the lower plate into said guiding means during each periodic discharge of the material into said guiding means.

18. In a machine for introducing powdered material into containers, a plurality of revolving chambers each adapted to be periodically charged with the material, an equal number of guiding means respectively disposed below and revolving with said chambers for directing the material therefrom into the containers, and fixed closure means interposed between said chambers and guiding means, said closure means being provided with a slot with curved parallel edges by which each of said chambers is adapted by the rotation to be progressively uncovered at its bottom subsequent to each periodic charge of the material therein and to therefore progressively discharge each periodic charge into its associated guiding means.

19. In a machine for introducing powdered material into containers, upper and lower plates conjointly rotatable with one another, the upper plate carrying a plurality of chambers each adapted to be periodically charged with the material, the lower plate carrying an equal number of guiding means respectively disposed below said chambers for directing the material therefrom into the containers, and fixed closure means interposed between said chambers and guiding means, said closure means being provided with a curved edge by which each of said chambers is adapted by the rotation to be progressively uncovered at its bottom subsequent to each periodic charge of the material therein and to therefore progressively discharge each periodic charge into its associated guiding means, said closure means being provided with another curved edge by which each of said guiding means is adapted by the rotation to have material deposited on the lower plate periodically forced therein.

20. In a machine for introducing powdered material into containers, upper and lower plates conjointly rotatable with one another, the upper plate carrying a circular row of chambers each adapted to be periodically charged with the material, the lower plate carrying an equal number of guiding means respectively disposed below said chambers, and a fixed closure plate interposed between said chambers, and guiding means, said closure plate being provided with a curved slot by the outer edge of which each of said chambers is adapted by the rotation to be progressively uncovered at its bottom subsequent to each periodic charge of the material therein and to therefore progressively discharge each periodic charge into its associated guiding means and by the inner edge of which each of said guiding means is adapted by the rotation to have material deposited on the lower plate forced therein during each periodic discharge of the material therein.

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