

July 18, 1939.

C. H. WHITEMORE

2,166,192

TABLET MAKING MACHINE

Filed April 14, 1936

3 Sheets-Sheet 1

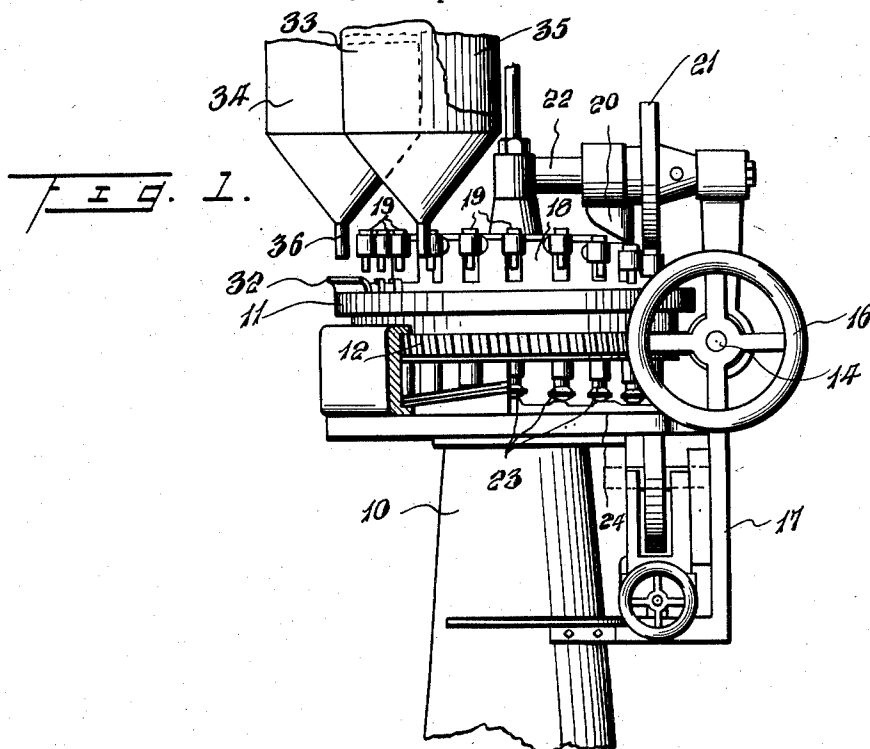
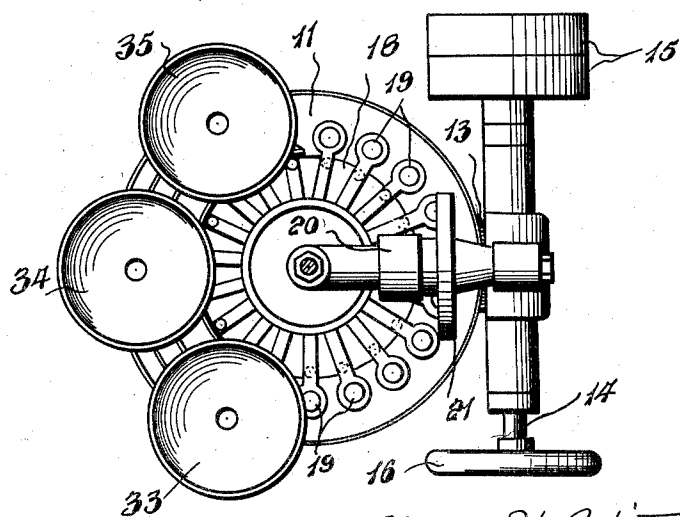


FIG. 2.



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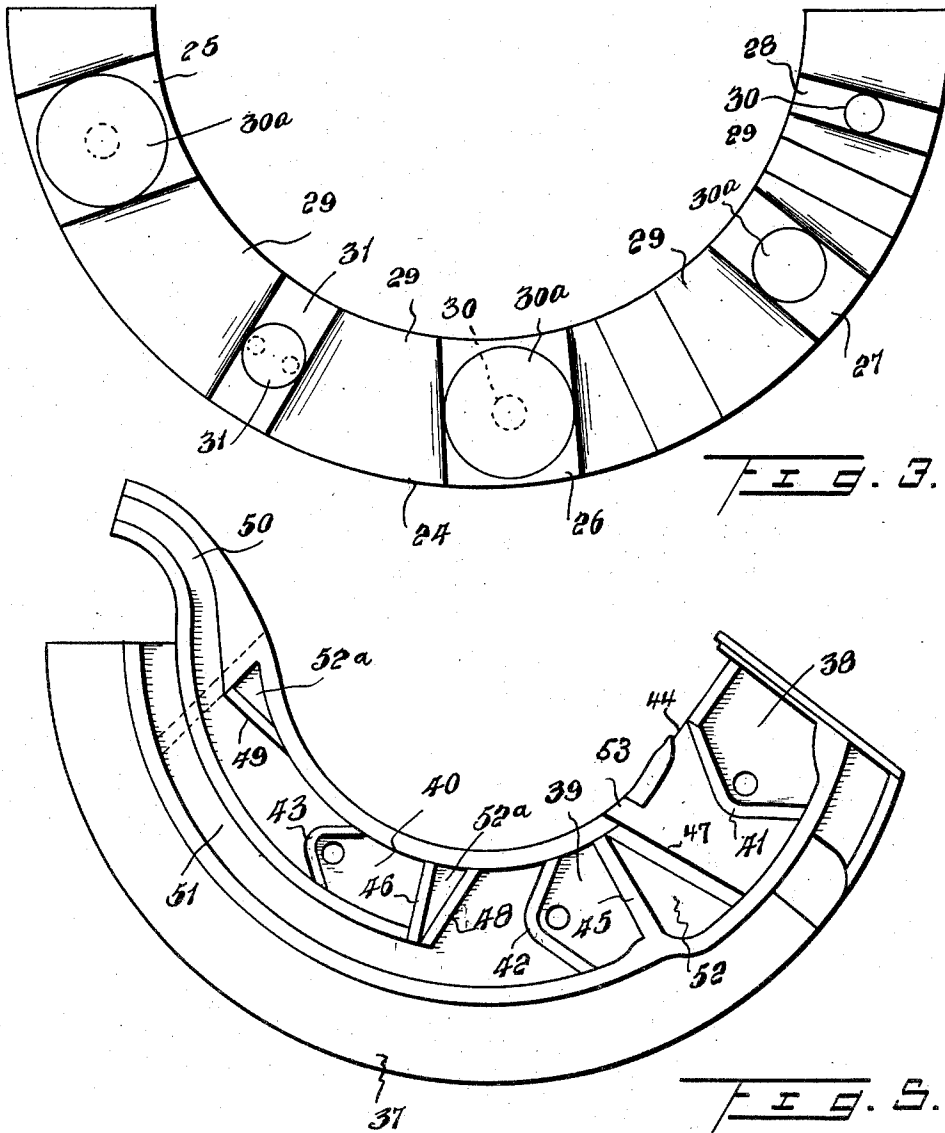
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TABLET MAKING MACHINE

Filed April 14, 1936

3 Sheets-Sheet 2



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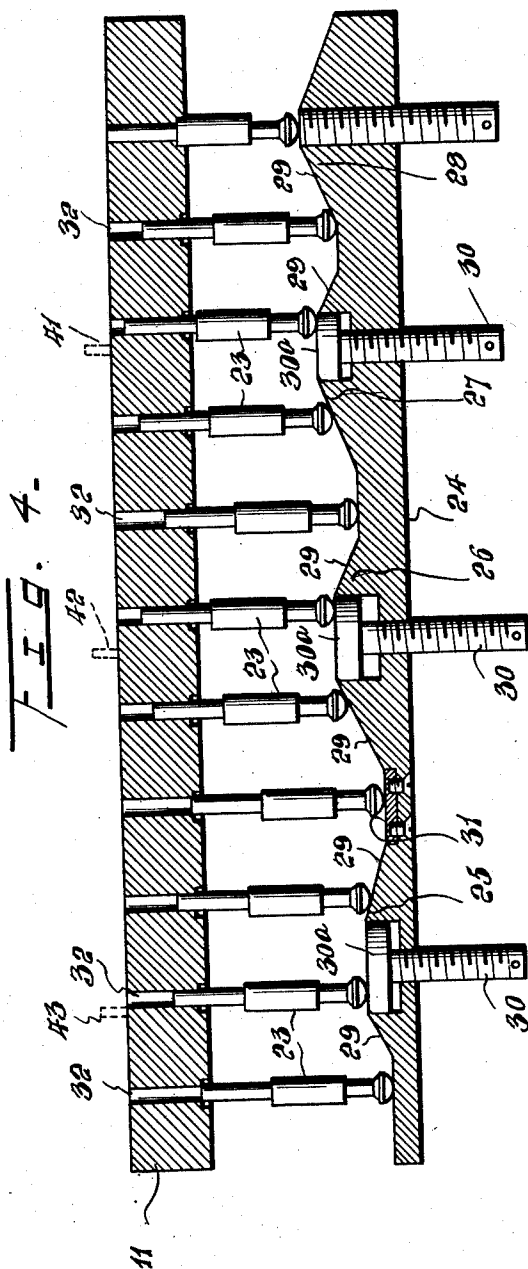
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TABLET MAKING MACHINE

Filed April 14, 1936

2,166,192

3 Sheets-Sheet 3



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2,166,192

TABLET MAKING MACHINE

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Application April 14, 1936, Serial No. 74,254

7 Claims. (Cl. 107-17)

This invention relates to machines for making compound tablets, and has special reference to a machine of this class, particularly to a tablet-making machine adapted to assemble, in a single tablet, a plurality of chemically incompatible drugs separated in layers by inert material.

A further object of the invention is to provide, in such a machine, means whereby successive mold capacities may be varied at will, such means including adjustable sections on a cam for regulating the position of a series of lower plungers.

A further object of the invention is to provide a novel means for delivering the granulated materials separately to each mold at predetermined points in their paths.

A further object of the invention is to provide novel means whereby excess of the different materials above the predetermined amount will be separately removed from the top of the molds by means hereafter described.

In the drawings like reference characters indicate like parts in the several views, and

Figure 1 is a fragmentary side elevational view of the upper part of the improved machine, partly broken away and shown in section;

Figure 2 is a top plan view showing the three hoppers and upper punch holders;

Figure 3 is an enlarged top plan view of the cam track;

Figure 4 is a fragmentary sectional view of the cam track and lower plungers or punches extending upwardly into molds or die openings in the revolvable die holder, and

Figure 5 is an enlarged plan view of the feed rack showing three compartments respectively for the inert and medicinal materials.

In the accompanying drawings, which show a preferred embodiment of the invention, the reference character 10 designates a standard having a revolvable die holder 11 mounted upon the upper end thereof, the die holder carrying an annular worm gear 12 engaged by a worm 13 on a shaft 14 that may be either power operated as at 15 or hand operated as at 16. The shaft 14 is supported in a standard 17 carried by the standard 10.

A plunger carrier 18 is superimposed upon and revolves with the die holder 11 and carries a series of upper plungers or punches 19 which are normally held in an elevated position but are adapted to be depressed during part of the revolution of the carrier and die holder by means of a cam 20 and a wheel 21 carried by a support 22.

Another series of punches or plungers 23 are

supported beneath the die holder 11 to travel therewith and the lower set of punches or plungers 23 ride on a cam track 24 shown more clearly in Figures 3 and 4.

The cam track 24 is of arcuate formation in plan view, the illustration in Figure 4 being somewhat schematic and the upper face of the cam track 24 has a series of cam abutments 25, 26 and 27, of successively increasing heights with inclined approach walls 29. The cam heads 30A each have an adjustable screw 30 projecting upwardly therethrough to adjust the position of the cam head at the crest of the cam abutments for contact with the lower ends of the lower set of plungers or punches 23 to compensate for wear of the parts and to vary the throw of the lower set of plungers or punches. The upper ends of the lower set of plungers or punches 23 project upwardly into molds or die openings 32 as shown in Figure 4, while the upper set of plungers or punches 19 are adapted to project downwardly into the openings as required.

As shown in Figures 1 and 2, three separate feed bins 33, 34 and 35 are supported adjacent and above the die holder 11, and are adapted to contain different ingredient materials. These bins deliver the materials through passages, such as shown at 36 to an arcuate feed rack 37 shown more clearly in Figure 5.

As shown in Figure 5, the feed rack 37 is provided with three compartments 38, 39 and 40 beneath which the die holder constituting the mold plate 11 passes. Each of the compartments of the rack is formed by walls extending upwardly from the die plate, one wall of the respective compartments being substantially V-shaped in plan as shown at 41, 42, and 43 and constituting a guttering wall to insure the granulation flowing downwardly through openings in the die plate to fill the die. Another wall of each of the compartments is a diagonal deflecting wall as shown at 47, 48 and 49 removably attached. The deflecting wall 47 guides any excess material which may pass beneath the wall 41 out through an opening 52 in the side wall of the feed rack and, following the rotating motion of the die holder is guided back to compartment 38 through opening 44 for further feeding. Deflecting walls 48 and 49 guide excess material which passes beneath the walls 42 and 43 respectively, into the passages 51 and 50 for separate collection and return to the bins 34 and 35. Dust bins 52 and 52A are formed behind walls 47, 48 and 49, to catch any material which may pass beneath the deflecting walls 47, 48 and 49 respectively.

The materials are fed from the bins 33, 34, and 35 into compartments 38, 39 and 40 in feed-rack 37 for discharge therefrom into the molds or die openings 32, the lower set of plungers 23 always remaining in the die openings for the collection of the materials. At the proper times, the upper set of plungers 19 is displaced relative to the die openings to permit charging of the latter. The cam 20 and the wheel 21 effect raising and lowering movements of the upper set of plungers or punches 19 for cooperation with the lower set of plungers 23 for compacting the materials into tablet form in the known manner.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that many minor changes may be made in the form and construction of the invention without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact form herein shown and described but it is desired to include all such as properly come within the scope claimed.

What is claimed is:

1. In a multiple-layer, compressed tablet making machine, a rotary die plate provided with a multiplicity of annular powder receiving openings extending through said plate, a plurality of feed bins, a feed rack resting on said plate and beneath which the openings travel in succession, partitions dividing said feed rack into a series of separated compartments, each communicating with and adapted to receive material from a respective feed bin, whereby successive charges of powdered materials may be delivered from each compartment to each opening, one wall of each compartment forming a levelling strip under which the openings pass after filling, and means for collecting separately the surplus materials.
2. As an element in a machine for producing multiple-layer, compressed tablets, a feed rack divided into a series of entirely separate compartments, each adapted to receive and to discharge a separate material in a given order into tablet forming chambers and means to carry off separately the surplus material of each kind unmixed.
3. As an element in a machine for producing multiple-layer, compressed tablets, a feed rack divided into a plurality of entirely separate compartments, each compartment being subdivided by walls extending upwardly, one subdivision wall of each compartment being substantially V-shaped and constituting a guttering wall, and another of said subdivision walls of each compartment constituting a diagonal deflecting wall for guiding excess material from each compartment to a point where it may be collected unmixed.
4. As an element in a machine for producing multiple-layer, compressed tablets, a feed rack divided into a plurality of entirely separate compartments, each compartment being subdivided by walls extending upwardly, one subdivision wall of each compartment being substantially V-shaped and constituting a guttering wall, and another of said subdivision walls of each compartment constituting a diagonal deflecting wall for guiding excess material from each compartment to a point where it may be collected unmixed, and to form

an isolated chamber for collecting mechanical seepage of any material not completely removed by the said deflecting wall.

5. In a compressed-tablet-making machine of the rotary die-plate type, adapted for producing multiple layer tablets, means for successively feeding different component materials into the dies, comprising a series of successive feed-rack compartments resting upon the rotary die plate, each such feed-rack compartment being subdivided by guttering walls adapted to guide the material for forming the tablets over the die openings and diagonally disposed deflecting walls for discharging and guiding excess material from each successive compartment to a different point where each such material may be collected unmixed with any of the other materials from each of the successive compartments.

6. In a compressed-tablet-making machine of the rotary die-plate type, adapted for producing multiple layer tablets, means for successively feeding different component materials into the dies, comprising a series of successive feed-rack compartments resting upon the rotary die plate, each such feed-rack compartment being subdivided by guttering walls adapted to guide the material for forming the tablets over the die openings and diagonally disposed deflecting walls for discharging and guiding excess materials from each successive compartment to a different point where each such material may be collected unmixed with any of the other materials from each of the successive compartments; and provided, in combination and cooperation therewith, with means for controlling the successive upward and downward movements of lower plungers to permit the dies to receive successively the predetermined measured quantities of each successive ingredient fed into each of the dies by each successive feed-rack compartment.

7. In a multiple-layer compressed tablet-making machine, in combination, a rotary die-plate provided with a multiplicity of annular powder receiving openings extending through said plate; a plurality of feed bins; a series of successive feed-rack compartments resting upon the rotary die-plate, each such feed-rack compartment being subdivided by guttering walls adapted to guide the material for forming the tablets over the die openings and by diagonally disposed deflecting walls for discharging and guiding excess materials from each successive compartment to a different point where each such material may be collected unmixed with any of the other materials from each of the successive compartments; a cam track adapted to engage slidably a procession of plungers engaged within the die openings of the rotary die-plate and moving therewith, and to impart to them a series of cycles of successively graduated reciprocating upward and downward motions, each successive cycle of such plunger movements being adapted to give to said plungers differently graduated amplitude of motion; and provided, in combination and cooperation therewith, with means for controlling the successive upward and downward movements of said plungers to permit the dies to receive successively the predetermined measured quantities of each successive ingredient.

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