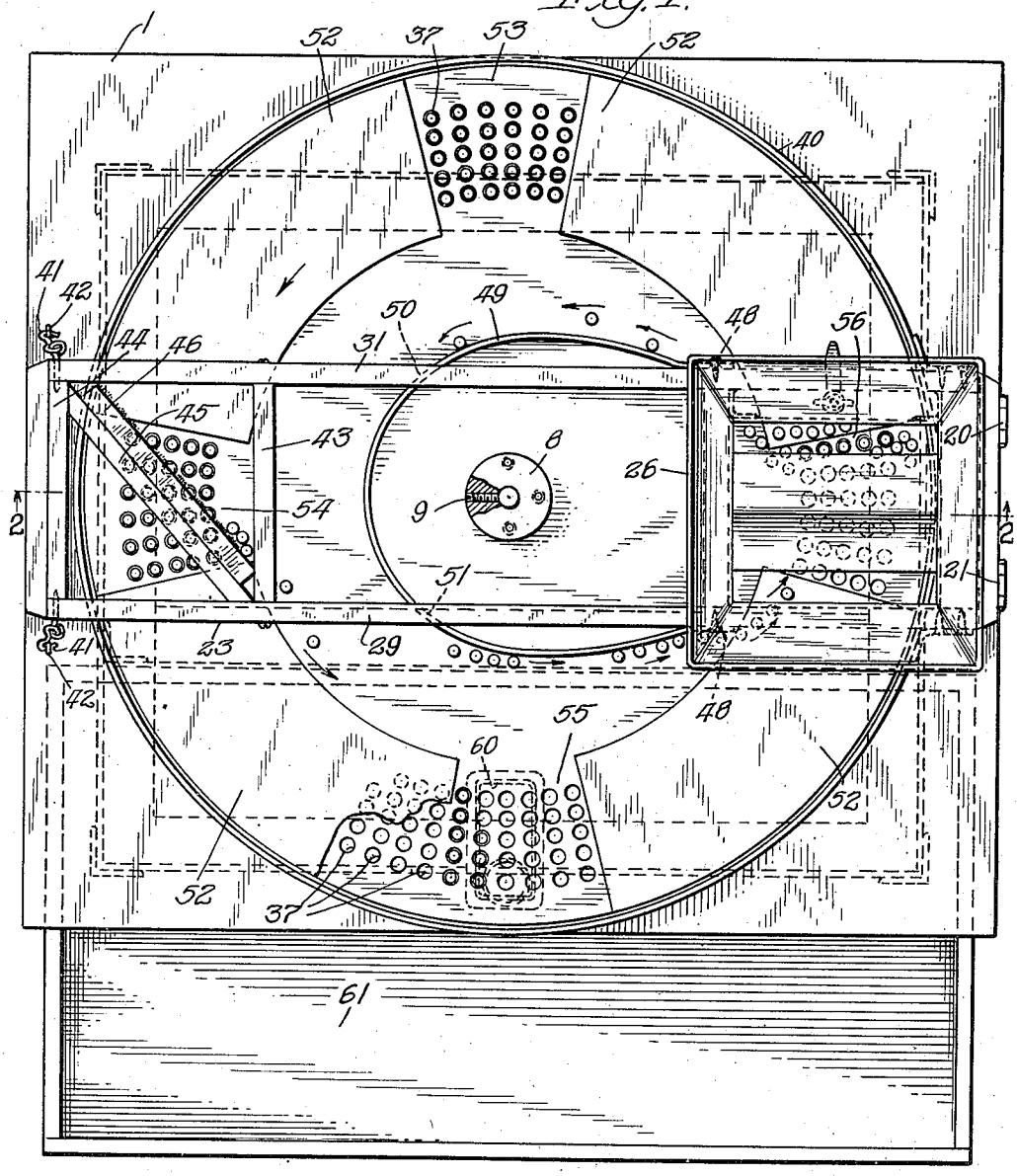
Dec. 28, 1948. C. C. FOWLER ET AL 2,457,220

TABLET COUNTING APPARATUS

Filed March 16, 1945 3 Sheets-Sheet 1

Fig. 1.



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TABLET COUNTING APPARATUS

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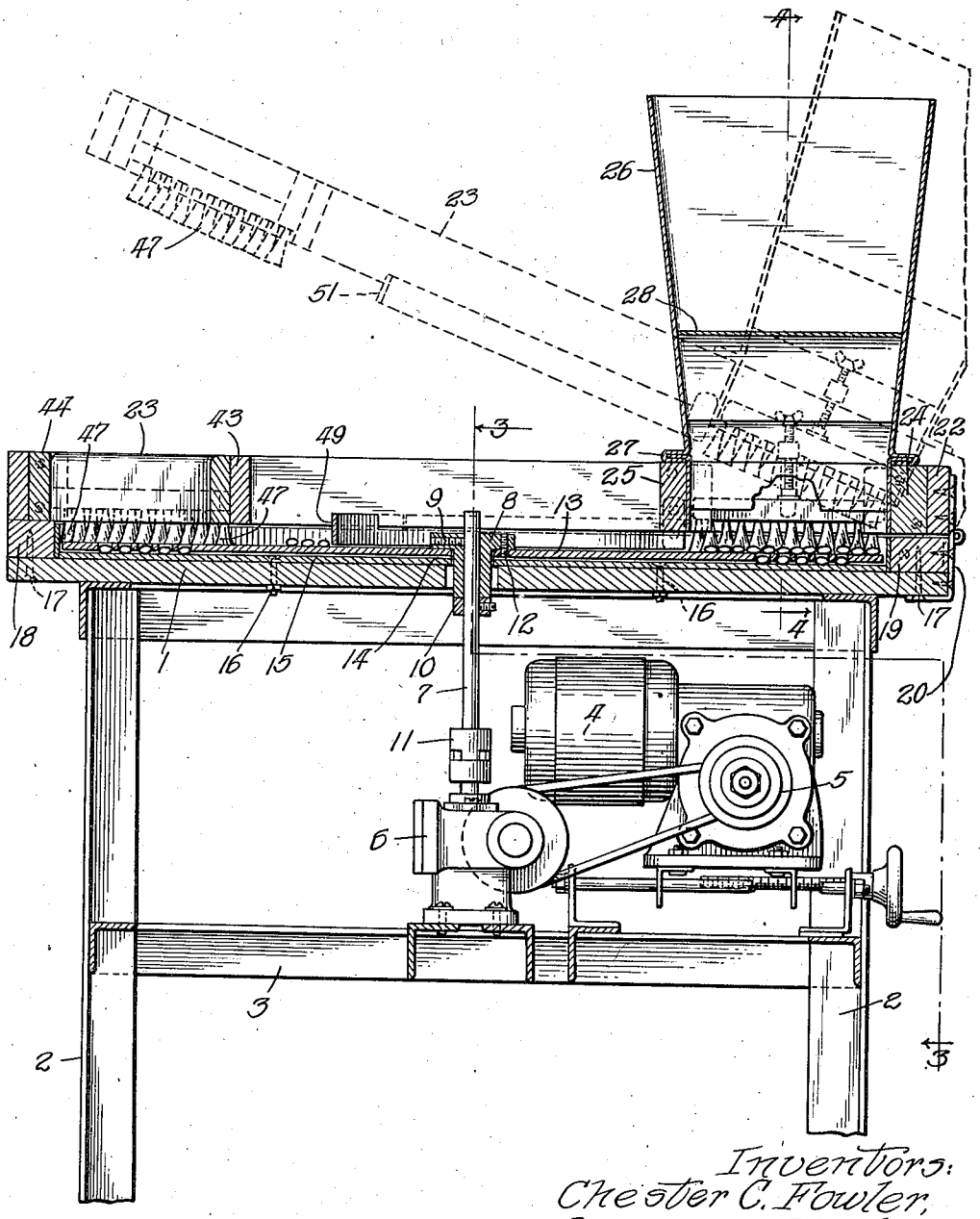
Fig. 2.



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TABLET COUNTING APPARATUS

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Fig. 3.

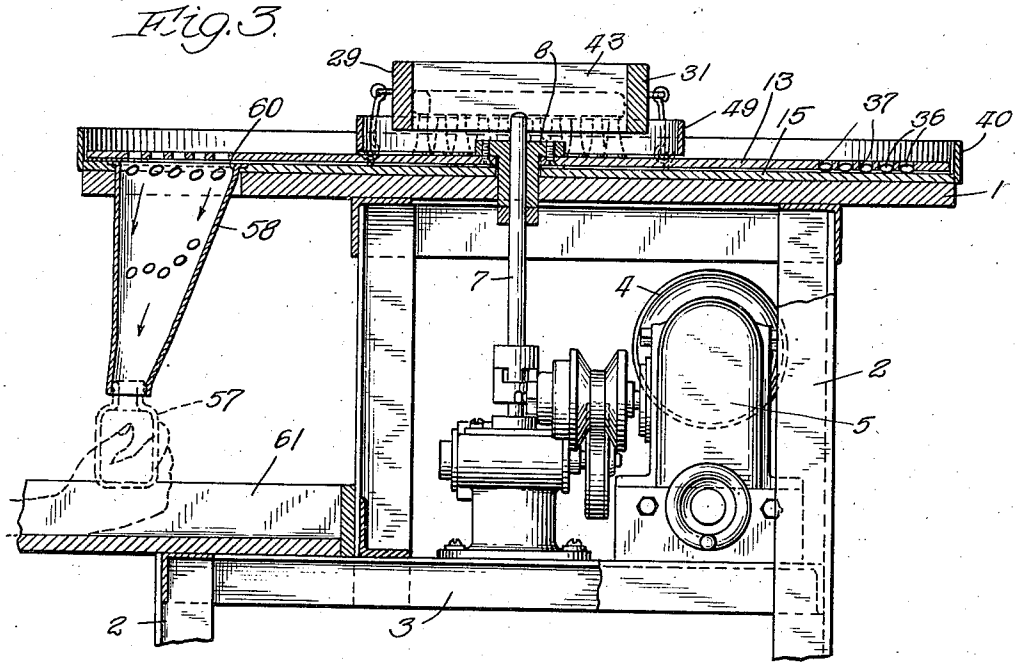


Fig. 4

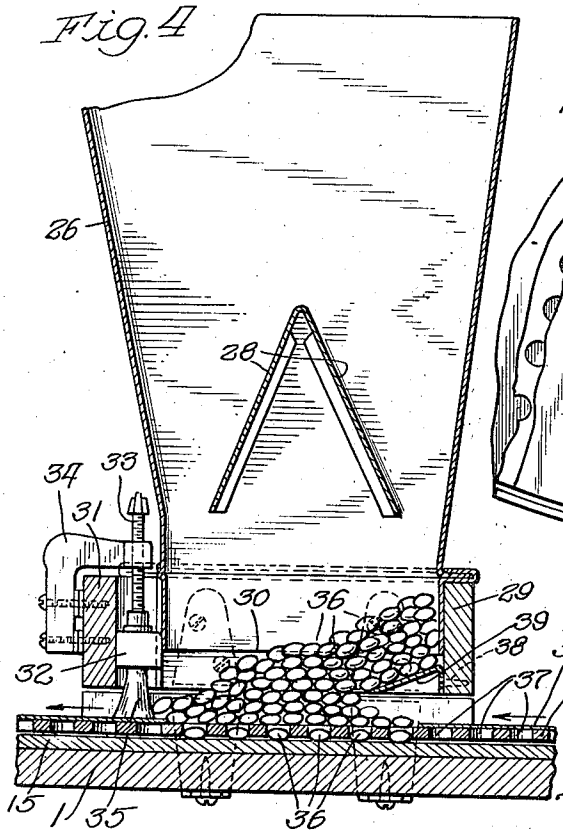
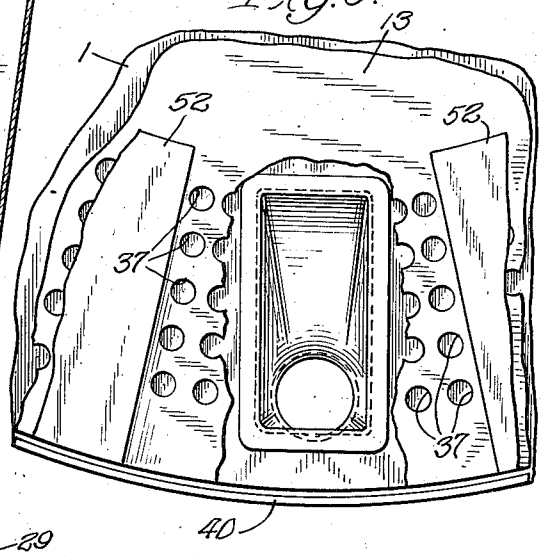


Fig. 5.



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UNITED STATES PATENT OFFICE

2,457,220

TABLET COUNTING APPARATUS

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7 Claims. (Cl. 226—2)

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This invention relates to a machine for counting tablets, pills and other articles of a shape and size adaptable to being counted in this machine, and which for convenience will hereinafter be referred to as tablets. In the present machine the tablets are dumped into a hopper or the like, and thereafter are automatically handled without being touched by human hands, are arranged in groups so that a certain predetermined number of tablets will be in each group, and conveyed in that definite grouping to a place of deposit into a container, with a certainty that the correct number of tablets will be in each container.

Among the objects of our invention is to provide a machine capable of effecting the accomplishment of the above mentioned advantages, continuously for as long as desired, and without error that might occur if the counting were done by hand.

A further object is to provide such a machine that is efficient in operation, can be operated by a single attendant, requires no outside attention other than bringing tablets to be deposited into the hopper and taking away the containers containing the counted tablets, and is simple in construction and safe to operate.

Another object is to provide a turntable formed in an annular zone around its circular extent with regularly arranged openings so that desired portions of the perforated zone may be selectively covered over to leave exposed the predetermined number of openings corresponding to the definite number of tablets desired to be introduced into the container.

A still further object is to provide a novel sweeping device to sweep away excess tablets when the exposed openings in the turntable, corresponding to the number of tablets desired, have been filled, to insure that the number of tablets filled into the container will be correct.

Another object is to provide removable means for covering up those holes not desired, and leave exposed in spaced groups the desired predetermined number of holes, so that as the turntable rotates, such groups of holes will be spaced apart such distances as to enable the filling of one container with the predetermined number of tablets, removing the filled container and positioning an empty container in place before the next group of holes with the proper number of tablets passes over the hopper leading to the container, and so on for the succeeding groups of openings.

A further object is to provide a novel arrangement of hopper and associated parts for placing only one tablet in each opening of each group, as the groups successively pass under this hopper.

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A still further object is to provide novel means for guiding stray tablets back to the hopper which places the tablets in the spaced groups of holes in the turntable.

Other objects, advantages and capabilities inherently possessed by our invention will later more fully appear.

Our invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and while we have shown therein a preferred embodiment, we wish it understood that the same is susceptible of modification and change without departing from the spirit of our invention.

In the drawings:

Fig. 1 is a top plan view of a tablet counting apparatus embodying our invention, parts being broken away for the sake of clearness.

Fig. 2 is a vertical transverse section on the line 2—2 of Fig. 1, with parts being broken away and other parts being shown in elevation for clearness, and showing in dotted lines the wiper frame swung upwardly a distance away from the turntable.

Fig. 3 is a fragmentary vertical section on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary vertical section on the line 4—4 of Fig. 2.

Fig. 5 is a fragmentary plan view of a portion of the turntable and supporting table, with a portion of the supporting table and the turntable broken away to show the container filling hopper therebelow.

Referring more in detail to the drawings, our tablet counting apparatus comprises a supporting table 1 fixed upon supporting legs 2 provided with laterally extending braces 3 upon which are mounted a motor 4, reduction gearing 5 and 6, from the latter of which upwardly extends a drive shaft 7 provided at its upper end with a hub 8 fixed thereto by a set screw or the like 9, and further supported on the shaft by a collar 10, shaft 7 being driven through suitable mechanism from motor 4 and controlled as desired by clutch 11. Fixed to hub 8 by any suitable number of screws 12, or other suitable connecting means, is a turntable 13, spaced by means of a thin separating metal disc 14 a slight distance from a facing layer 15 fixed by bolts or the like 16 to the supporting table 1.

Fixed at diametrically opposite points to table 1, by screws or the like 17, are a pair of support-

ing members 18 and 19, preferably of wood. To the outer face of member 19, and to the adjacent end of table 1, are secured a pair of hinges 20 and 21, the other portion of which hinges are secured to the end member 22 of a rectangular frame 23. Within this frame is secured between cross members 24 and 25, a hopper 26 having as shown in Fig. 2 near its bottom portion a perimetal flange 27 adapted to rest upon cross members 24 and 25 and at their other two sides upon the upper edges of frame 23. Extending laterally across the interior of the hopper 26 is a V-shaped baffle 28 as will be understood in Fig. 4. The bottom edges of baffle 28 are spaced a distance away from the adjacent inner side walls of the hopper, so as to spread the tablets or the like laterally toward the sides of the hopper, and prevent the total weight of the tablets in the hopper from bearing directly upon the turntable.

As seen in Fig. 2, the frame 23 normally rests at its ends on members 18 and 19 and through the medium of hinges 20 and 21 may be swung upwardly a desired distance as shown in dotted lines in Fig. 2. As shown in Fig. 4, one of the side faces of the bottom portion of the hopper contacts the inner face of the longitudinal member 29 of the frame, the bottom edge 30 of the hopper being spaced a suitable distance above the turntable 13. The other side face of the bottom portion of the hopper is spaced inwardly a distance from the other longitudinal member 31 of the frame, to receive a brush support 32 vertically slidable in the space between the bottom portion of the hopper and longitudinal member 31 by means of an adjusting screw 33 threadably mounted in the bracket 34 fixed to longitudinal member 31.

This brush is provided with downwardly extending tufts 35, which are positioned to bear with suitable pressure against the upper face of the turntable, so as to have a sweeping action as the turntable passes thereunder. The thickness of the turntable is such as to insure that only one tablet will be present in each hole 37 as these holes in the turntable pass under the hopper 26, the brush 35 holding back any excess tablets as the turntable passes under the hopper and insuring the presence of only one tablet in each hole.

Fixed by screws or the like 38 to the bottom of the inner face of the longitudinal member 29, is an angle plate 39 at one side of the bottom of the hopper to prevent the tablets from excess crowding at the side where the turntable passes into the space below the hopper. As will be understood the brush 35 is positioned on the trailing side of the hopper where the turntable passes out from thereunder. As seen in Fig. 4 the bottom face of the tablets when in holes 37 slide along the upper face of the stationary facing member 15 fixed to the top face of the table 1, which facing member is circular and of slightly greater diameter than the diameter of the turntable as will be understood in Fig. 3. Fixed to the perimeter of facing member 15 and extending upwardly a short distance therefrom, is an annular flange 40 which extends high enough to prevent any of the tablets from falling laterally off of the turntable. The space between the bottom face of the turntable and the upper face of the facing member is small enough to prevent any of the tablets from becoming wedged therebetween.

The end of the rectangular frame away from the hopper 26 is releasably held against the member 18 by hooks 41 removably engaging eyes 42 in the table, or any other suitable releasable securing means may be used as desired. By releasing this securing means the rectangular frame 23 may be raised to enable inspection, repairs, or cleaning of the turntable underneath the same. Extending laterally between the longitudinal members 29 and 31 of the frame is a cross member 43, the bottom edge of which, as seen in Fig. 2, is spaced above the upper surface of the turntable. Extending diagonally across the space between the cross member 43 and the end member 44 of the rectangular frame is a supporting member 45 to which is mounted a brush support member 46 upon which are mounted a number of brushes 47, as seen in Fig. 2, the bottom ends of the tufts of which brushes contact the upper face of the turntable and are positioned at an inwardly extending angle as seen in Fig. 1, to brush any excess tablets toward the inside of the turntable and away from the hole groups, as the turntable rotates under this brush.

Fixed to the outer side faces of the longitudinal members 29 and 31 of the rectangular frame by means of screws or the like 48, and along two sides of the hopper, are the ends of a barrier-band 49 which is extended in the form of a curved loop inwardly from the hopper, the upper edges of this barrier-band passing through notches 50 and 51 into the bottom edges of the longitudinal members 29 and 31 of the frame as will be understood in Figs. 1 and 2. This construction enables the barrier-band to be carried with the rectangular frame and extended downwardly therebelow a sufficient distance to be close to, but not in rubbing contact with, the turntable. As seen in Fig. 1 the purpose of this barrier-band is to prevent any said tablets from moving into the middle of the turntable and to guide such tablets around the turntable close to the barrier-band and cause them to be returned to pass under the bottom of the hopper 26.

As seen in Fig. 1 the turntable has formed therein a large number of regularly positioned holes 37 which may, if desired, extend entirely around the outer annular zone of the turntable, or at least to a large portion of the same. As noted in Fig. 1 these holes are arranged in series of aligned annular paths at regular distances apart, these annular series or circles being radially spaced apart equal distances, so that by blocking off any desired portion of the upper face of the turntable, for example by a plurality of masks 52 of paper or other suitable flexible material glued or otherwise caused to adhere to the top face of the turntable. These masks cover the desired number of holes in the turntable, leaving exposed such number of groups of holes, as indicated in the spaces 53, 54, 55 and 56. Each of these spaces are of such extent as to leave exposed the same number of holes in each space or group, the number of holes so left exposed in each group being the number of tablets desired to be deposited in the container 57 (see Fig. 3) when each of these groups of holes move singly into position above the hopper 58, the enlarged upper end of which is open, and the lower end of which is constricted to a size to fit the neck of the container being filled therefrom.

For example in space 53 (Fig. 1) there are 30 holes left exposed which means that as these 30 holes pass under the hopper 26, one tablet will be deposited in each hole and carried around with the turntable until they pass over the open upper end of hopper 58, at which time the radial rows of tablets will be successively positioned over the hopper and the tablets dropped through the hop-

per into the container, thus insuring that the desired number of tablets will be filled into the container. While for illustrative purposes we have shown four of these spaces or groups **53—56** of exposed holes, we wish it understood that any other number of such spaces, or groups, may be used around the turntable as will best suit the operation of the particular apparatus being used. We also wish it understood that in each group, or space any other number than 30 of exposed holes may be used as desired, the important feature being that whatever number of holes is left exposed in each group, that will be the number of tablets deposited for each group through hopper **53** into each container positioned in the bottom of this hopper. When one container has been filled from one group of holes an empty container will be immediately positioned in the bottom of this hopper and filled from the next successive group of holes, and successive containers will be filled from successive groups of holes as the turntable rotates to bring these groups successively over the hopper.

From the above it will be understood that all that is necessary is to fill hopper **26** with a sufficient supply of tablets, and start the turntable in operation through the motor and connecting mechanism therebelow, after which the tablets, one for each hole in each group, will be carried around with the turntable until deposited through hopper **58** into the successive containers **57**, thus insuring a predetermined number of tablets in each container, the number of which tablets will be that determined by the number of holes in each group or space **53—56**. Also as understood, the flange **40** will prevent stray tablets from falling off the turntable, the brushes **46** will guide any stray tablets towards the interior of the turntable, and the barrier-band **49** will guide any such stray tablets back to a position beneath hopper **26**.

As will be understood the masks **52** may be of paper or other suitable material, and so attached to the upper face of the turntable that when it is desired to change the number of holes in each group, an additional strip or strips of masking paper may be fastened over the number of holes desired to cover up some of the holes if the number is smaller than what the masks are set for, or portions of the mask may be removed to expose more holes if the number of holes desired is larger than what the masks are set for. In other words, the number of holes in each group (which controls the number of tablets to be filled in each container) may be positively controlled by the number of holes permitted to remain exposed in the spaces between the ends of the masks. The container filling hopper **58** is removably mounted to the table by means of a flange **60** seated in a correspondingly shaped depression in the facing layer **15** so that when the turntable is removed the filling hopper can be removed and replaced by any other hopper desired for filling other sizes of containers. Shelf **61** is provided below the hopper **58** and serves as a work table upon which the containers **57** may be stocked empty on one side, then filled, and the filled containers moved to the other side of the table for removal as desired. As will be understood, the operator stands in front of shelf **61** to facilitate the handling of the containers and operation of the apparatus.

Having described our invention, we claim:

1. In a tablet counting machine, a stationary table having an upstanding circumferential flange, a turntable rotatably mounted on the stationary table within said flange, a frame hingedly mounted on the stationary table for vertical swinging movement thereon, a hopper on the frame on one side of the table adapted to have tablets placed therein; said turntable having a plurality of annularly spaced groups of holes, each group having the same predetermined number of holes, said groups of holes successively passing under the hopper to receive tablets in the holes as the turntable rotates, a wiper on the trailing side of the hopper to brush back any excess tablets from the surface of the group, a wiper in the frame on the opposite side of the table, said wiper being positioned at an angle to divert inwardly any stray tablets so as to insure that the hole groups passing under the angularly positioned wiper will have only one tablet for each hole, and a second hopper below the stationary table into the open mouth of which the tablets of a group that has passed the angular wiper will be released for passage into a container so that each container thus filled will contain the exact predetermined number of tablets.

2. In a tablet counting machine, a stationary table having an upstanding circumferential flange, a turntable rotatably mounted on the stationary table within said flange, a frame hingedly mounted on the stationary table for vertical swinging movement thereon, a hopper on the frame on one side of the table adapted to have tablets placed therein; said turntable having a plurality of annularly spaced groups of holes, each group having the same predetermined number of holes, said groups of holes successively passing under the hopper to receive tablets in the holes as the turntable rotates, a wiper on the trailing side of the hopper to brush back any excess tablets from the surface of the group, a wiper in the frame on the opposite side of the table, said wiper being positioned at an angle to divert inwardly any stray tablets so as to insure that the hole groups passing under the angularly positioned wiper will have only one tablet for each hole, and a second hopper below the stationary table into the open mouth of which the tablets of a group that has passed the angular wiper will be released for passage into a container so that each container thus filled will contain the exact predetermined number of tablets, and a curved barrier band secured to the lower side of the frame to guide stray tablets back to the space beneath the first mentioned hopper.

3. In a tablet counting machine, a turntable having around its circular extent a plurality of annularly spaced groups of a predetermined number of holes, means for rotating the turntable, a hopper above the turntable and having an open bottom under which all of the holes of each group can successively pass as the turntable rotates so that one tablet will be deposited in each hole of each group as the holes and the groups successively pass under the hopper, means at the trailing edge of the hopper to wipe back from the moving surface of the turntable any excess of tablets over one for each hole, a second hopper below the turntable at a point from the first mentioned hopper and having a mouth of a size to successively receive all of the tablets of one group as they successively pass thereover whereby a predetermined counted number of tablets may pass through the second hopper into a container, means on the opposite side of the turntable from the first mentioned hopper for diverting stray tablets away from the location of said second hopper, a frame pivotally mounted above said

turntable for vertical swinging movement with relation thereto, said first mentioned hopper and said stray tablet diverting means being carried by said frame for movement upwardly away from the turntable when the frame is so moved.

4. In a tablet counting machine, a turntable having around its circular extent a plurality of annularly spaced groups of a predetermined number of holes, means for rotating the turntable, a hopper above the turntable and having an open bottom under which all of the holes of each group can successively pass as the turntable rotates so that one tablet will be deposited in each hole of each group as the holes and the groups successively pass under the hopper, means at the trailing edge of the hopper to wipe back from the moving surface of the turntable any excess of tablets over one for each hole, a second hopper below the turntable at a point from the first mentioned hopper and having a mouth of a size to successively receive all of the tablets of one group as they successively pass thereover whereby a predetermined counted number of tablets may pass through the second hopper into a container, means on the opposite side of the turntable from the first mentioned hopper for diverting stray tablets away from the location of said second hopper, a frame pivotally mounted above said turntable for vertical swinging movement with relation thereto, said first mentioned hopper and said stray tablet diverting means being carried by said frame for movement upwardly away from the turntable when the frame is so moved, and a curved, looped barrier-bar fixed to said frame for guiding stray tablets back to the first mentioned hopper when the frame is in lower position.

5. In a tablet counting machine, a turntable having in an annular path a plurality of spaced groups of a predetermined number of holes, a hopper under which said groups of holes successively pass so that one tablet will fall into each hole of the group under the hopper, means for rotating the turntable, and means for releasing the tablets of a group at a point removed from the hopper to pass into a container so that the container will contain an exact predetermined number of tablets, a vertically swingable frame above said turntable, means for guiding any stray tablets away from the location of the tablet-releasing point, said first mentioned hopper and said stray tablet guiding means being fixed to said frame for swinging movement therewith toward and away from the turntable.

6. In a tablet counting machine, a turntable having in an annular path a plurality of spaced groups of a predetermined number of holes, a hopper under which said groups of holes successively pass so that one tablet will fall into each hole of the group under the hopper, means for rotating the turntable, and means for releasing the tablets of a group at a point removed from the hopper to pass into a container so that the container will contain an exact predetermined number of tablets, a vertically swingable frame above said turntable, means for guiding any stray tablets away from the location of the tablet releasing point, said first mentioned hopper and said stray tablet guiding means being fixed to said frame for swinging movement therewith toward and away from the turntable, and releasable fastening means for holding said frame in close proximity to said turntable.

7. In a tablet counting machine a turntable having in an annular path a plurality of spaced groups of a predetermined number of holes, a supporting table upon which said turntable is rotatably mounted, a frame swingably mounted upon said supporting table and extending thereacross, a hopper on said frame under which hopper said groups of holes successively pass so that one tablet will fall in each hole of the group under the hopper, a second hopper below the turntable at a point removed from the first mentioned hopper for releasing tablets into a container, a curved looped barrier-bar on said frame for guiding stray tablets back into the space below the first mentioned hopper, said first mentioned hopper and said barrier-bar being swingable with the frame toward and away from said turntable.

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