

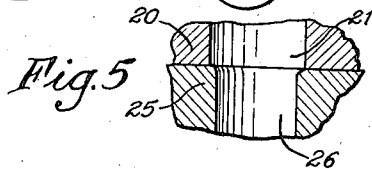
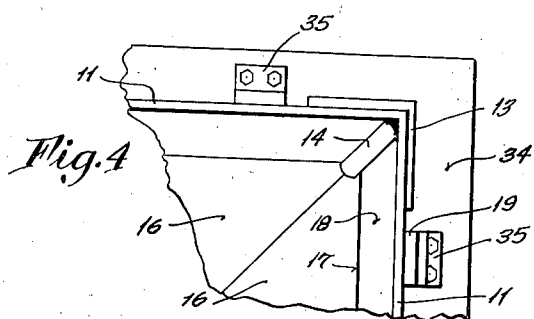
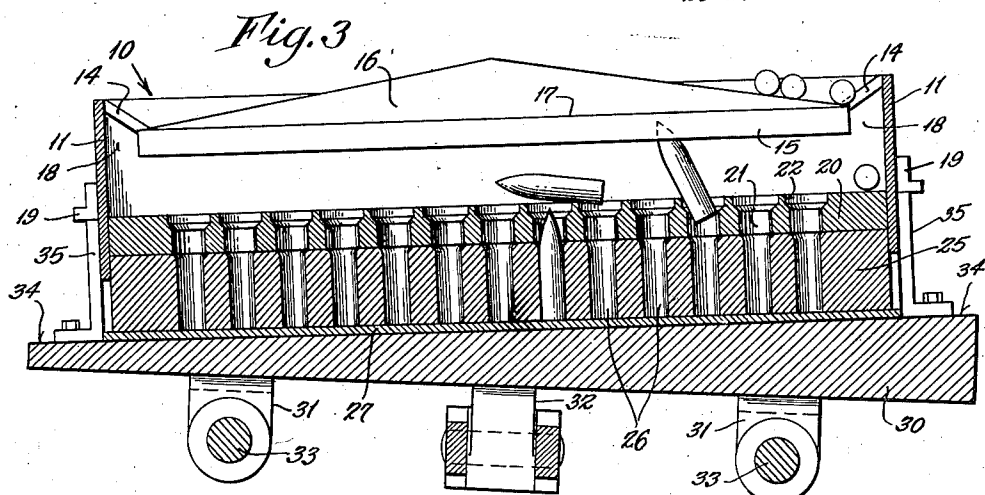
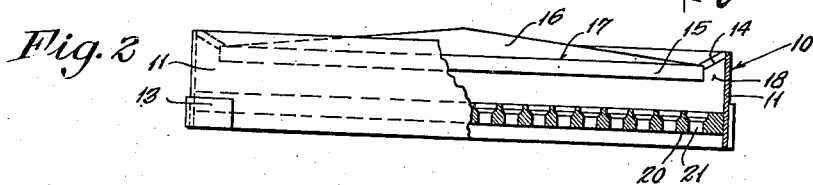
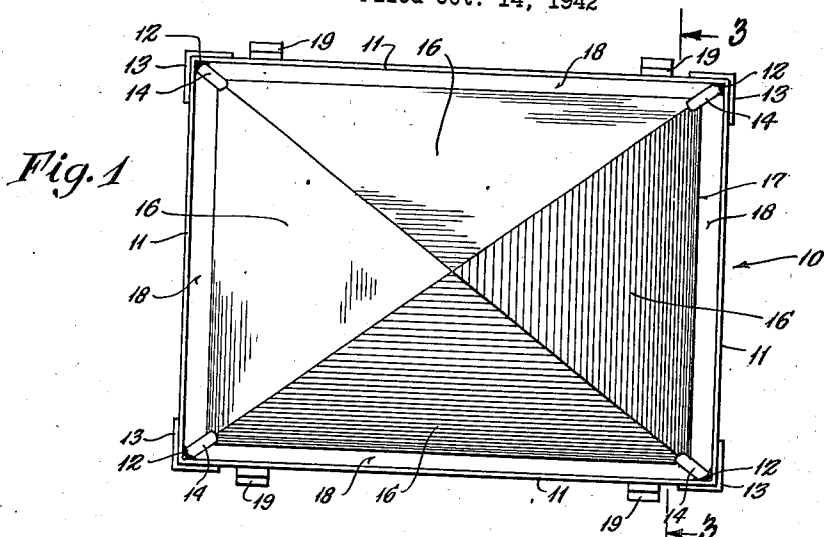
Oct. 23, 1945.

M. D. MAYBERRY

2,387,672

MACHINE FOR DISTRIBUTING AND ORIENTING BULLETS

Filed Oct. 14, 1942



INVENTOR
Muri D. Mayberry
BY
Harold L. Gammons
AGENT

UNITED STATES PATENT OFFICE

2,387,672

MACHINE FOR DISTRIBUTING AND ORIENTING BULLETS

Murl D. Mayberry, Golden, Colo., assignor to Remington Arms Company, Inc., Bridgeport, Conn., a corporation of Delaware

Application October 14, 1942, Serial No. 462,041

7 Claims. (Cl. 86—23)

This invention relates, in general, to a machine for orienting and distributing articles, and, particularly, to apparatus for distributing metallic articles such as bullets or cartridge cases into the transfer plates of a bullet setting machine.

It is an object of the present invention to provide improved means for rapidly distributing and orienting articles into a plurality of apertures. A further object is to provide means for automatically distributing bullets to a bullet orienting plate which is constructed and arranged to enter the bullets, heavy end down, into a bullet transfer plate.

Briefly, bullet setting machines of the type now in common use by the leading small arms ammunition manufacturing companies of this country are designed to simultaneously set and secure a plurality of bullets into the mouths of loaded cartridge cases. Prior to being set by the bullet setting machine, the bullets must first be loosely assembled in proximity to the mouths of the cases and supported in this relationship in the machine.

Suitable bullet supporting plates, known in the art as transfer plates, are used for initially assembling the bullets and cases. Each transfer plate comprises an apertured plate having an auxiliary plate arranged both to temporarily support the bullets in the apertures of the plate and to release the bullets so that they may drop down through the apertures into the mouths of the cases.

The present methods of filling the apertures of the transfer plates usually require two or more machine attendants whose duties are first to manually insert the bullets into the apertures of supplementary bullet supporting blocks and then to transfer the bullets from these supplementary blocks into the transfer plates.

The bullets may also be inserted into the apertures of the transfer plates by supporting the transfer plates on suitable agitating means which continuously agitate the plates, in which instance the bullets are delivered into the apertures of the plates by a supplementary bullet orienting plate supported on the transfer plates, the bullets being spread by hand over the surface of the orienting plate. The agitation of the orienting plate supplements the dexterity of the attendants in distributing the bullets over the plate and entering the bullets, heavy end down, into the transfer plates.

Although these methods are in extensive use, they are inherently slow and require a relatively large number of attendants in order to supply a

sufficient number of filled transfer plates to the bullet setting machine to keep it in continuous operation. The present invention discloses improved means for filling bullet transfer plates.

5 Other objects, features and advantages of the invention will be set forth in detail in the following description which illustrates one embodiment of the invention, but it will be understood that modifications thereof may be made without departing from the scope of the invention as defined in the appended claims.

In the drawing:

Fig. 1 is a plan view of the bullet distributing device.

15 Fig. 2 is an end elevation, partially in section, of the bullet distributing device showing the bullet orienting plate.

Fig. 3 is a schematic view partly in section on line 3—3 of Fig. 1 of the bullet distributing and

20 orienting machine of this invention.

Fig. 4 is a fragmentary plan view of one corner of the distributing device showing means for supporting the device on the agitating means.

Fig. 5 is an enlarged fragmentary sectional

25 view of the apertures shown in the bullet orienting and transfer plates.

Referring to Fig. 1, the bullet distributor is shown as comprising a substantially rectangular frame 10 formed by four substantially vertical

30 walls 11 secured together at their opposite ends by suitable fastening means such as a weld joint. The corners 12 thus formed may be reinforced by angle clips 13 welded to the outside surfaces of the corners in the manner shown.

35 The frame shown is designed to be used in conjunction with a bullet supporting means or transfer plate 25, hereinafter described, having apertures for receiving a plurality of bullets, the frame being made long enough and wide enough

40 to substantially circumscribe the transfer plate in the manner shown. It will be understood, however, that the shape and size of the frame may be altered to compare with the size of the bullet transfer plate to be used therewith.

45 A bracket 14 is welded at its outer end at each inside corner of the frame and extends diagonally downwardly toward the center thereof, as shown in Fig. 3, the brackets being formed of any suitable material such as 1/4 inch round stock cut in lengths of substantially one inch,

50 Supported within the bullet distributing frame by the four brackets 14 are bullet distributing or delivering surfaces which comprise a hollow substantially rectangular pyramid having a base or skirt portion 15 and four upwardly-converging

triangular surfaces 16. The pyramid is suspended within the four walls of the frame by the brackets 14, the inner ends of which are secured or welded to the four corners of the pyramid adjacent the upper edge 17 of the skirt portion 15. This upper edge 17 coincides with the lower edges of the triangular inclined surfaces 16 and is adapted to be spaced from the adjacent walls 11 of the frame so as to form a restricted aperture 18 substantially circumscribing the base of the pyramid. To this end the dimensions of the base of the pyramid are somewhat less than the dimensions of the frame and in the present embodiment are such that the restricted aperture 18 is somewhat greater in width than the diameter of a .30 caliber bullet. Hence, substantially all bullets passing down through the aperture 18 will be delivered sideways, that is to say, the long axis of the bullets being substantially parallel to the lower edges 17 of the inclined surfaces and the adjacent walls of the frame.

The height of the pyramid is such that its apex will extend slightly above the rim of the frame 10 while the lower edges 17 of the inclined surfaces are suitably positioned below the upper rim of the frame, so that the height of the wall adjacent the restricted aperture 18 is substantially equal to the diameter of a bullet. Hence, regardless of how many bullets are deposited on the inclined surfaces, the excess bullets will spill over the rim of the wall 11 so as to preserve a substantially single layer of bullets adjacent the restricted aperture 18.

Suitable means for supporting the distributor in operative position, see Fig. 3, comprise lugs 19 which are secured to the walls 11 of the frame adjacent the lower edge thereof and which project outwardly in the manner shown in Fig. 1.

Suitable bullet orienting means for receiving the bullets from the restricted aperture 18 of the distributing means and orienting the bullets with their heavy ends down comprises a substantially rectangular plate 20 having a plurality of drilled apertures 21. The diameter of each aperture is slightly greater than the diameter of a bullet and, in the plate shown, is substantially three eighths of an inch to loosely receive .30 caliber bullets. Each hole extends through the plate and is provided with a countersink 22 substantially nine sixteenths of an inch in diameter in the upper surface thereof. The dimensions of the base of the plate are substantially equal to the inside dimensions of the frame 10 so that when the latter is placed over the plate, as shown in Figs. 2 and 3, the walls 11 of the frame will circumscribe the edges of the plate 20. The thickness of the plate 20 is such that, when assembled in the distributing machine as shown in Fig. 3, its upper surface is adapted to lie in an inclined plane substantially parallel to the plane defined by the base 15 of the pyramid and spaced therefrom a distance which is slightly greater than the diameter of a .30 caliber bullet and which in this instance is substantially $\frac{3}{8}$ inch.

By spacing the surface of the bullet orienting plate from the lower edge of the pyramid in the manner described, a single layer of bullets will be maintained on the surface of the plate.

The inclination of the surface of the orienting plate is such that bullets delivered from the restricted aperture 18 will roll or slide down the surface of the plate and automatically orient themselves so as to enter the drilled holes of the plate heavy end down. By providing each aperture or drilled hole 21 with a suitable counter-

sink 22, any bullet which slides over the near edge of the countersink, nose first, will, due to the fact that the center of gravity of the bullet is adjacent the rear or base end of the bullet and hence outside of the near edge of the countersink, continue on across the countersink until its nose is supported on the far edge and the heel has cleared the near edge thereof. At this time, however, the center of gravity of the bullet will have moved inside the near edge of the countersink, and, consequently, the bullet will drop into the drilled hole heavy end first. Any bullet approaching a hole base end first will invariably drop down into the hole with its pointed end up.

In Fig. 3, the orienting plate is shown assembled in superposed relation on the bullet transfer plate 25. The latter has a plurality of apertures 26 corresponding in number to the number of apertures 21 in the orienting plate 20 and drilled through the plate 25. The holes 26 are indicated as being of a diameter substantially equal to the maximum outside diameter of the bullets which for .30 caliber bullets is substantially five sixteenths of an inch. To enable the bullets to enter the holes 26 easily, the shoulders of each hole are nicely rounded as shown clearly in Fig. 5. In their assembled relationship, the apertures 21 of the bullet orienting plate 20 and the apertures 26 of the transfer plate are substantially in axial alignment so that bullets which fall into the apertures of the orienting plate 20 will be entered freely into the apertures of the transfer plate. The bullets are retained in these apertures by a suitable imperforated retaining plate 27 which is adapted to be held against the bottom of the transfer plate until such time as the bullets are to be released from the apertures thereof.

In Fig. 3 the assembled bullet orienting plate 20, transfer plate 25 and retaining plate 27 are shown mounted upon a suitable agitating device 30 adapted to agitate the assembly so as to automatically enter the bullets into the bullet transfer plate.

The agitating device may comprise a substantially rectangular table or platform having suitable brackets 31 and a lug 32 projecting downwardly from the bottom thereof, the brackets 31 being constructed and arranged to slide on a pair of spaced parallel bars 33 and to be reciprocated thereon by suitable agitating means (not shown) connected to the lug 32. The top of the table 30 has an inclined surface 34 adjacent the four corners of which uprights or angle brackets 35 are fixedly secured. The brackets 35, see Fig. 4, constitute suitable means for supporting the assembled plates on the inclined surface 34 of the table, the plates being adapted to fit loosely between the brackets 35.

The bullet distributor is supported above the assembled plates by the lugs 19 which project laterally from the sides 11 of the distributor frame. These lugs are arranged to engage on the top edge of the brackets 35 as indicated in Fig. 3 and to permit the lower edges of the walls 11 of the frame to fit closely between the adjacent surfaces of the brackets and assembled plates, thus sufficing to keep all the parts in proper alignment.

The operation of the machine will be clear by reference to Fig. 3. The bullets to be entered into the transfer plate 25 are first scooped up and poured onto the back inclined surface 16 of the distributor 10. The agitator is then started

whereupon the bullets slide down the inclined surface 16 and are delivered therefrom through the restricted aperture 18 onto the upper edge of the inclined surface of the bullet orienting plate 20. The bullets are then oriented and fall down into the apertures 21 in the manner already described. Since the apertures 26 of the transfer plate are in axial alignment with the apertures 21, the bullets are thus entered into the transfer plate with their pointed ends up. Thereafter the frame 10 and orienting plate 20 may be removed from the transfer plate 25, which, with its retaining plate 27 is removed from the agitator and transferred to the bullet setting machine.

By providing the distributor with both front and back inclined surfaces 16, the distributor may be placed indiscriminately over the assembled plates at least one of the surfaces 16 forming a back inclined surface.

What is claimed is:

1. In a machine for orienting and distributing articles, the combination with a table and means for agitating said table; of article supporting means having apertures mounted on said table and agitated thereby; article orienting means mounted on said supporting means, said orienting means comprising an inclined surface having apertures in axial alignment with the apertures of said supporting means; brackets on said table; a frame supported on said brackets, said frame having substantially vertical walls interposed between said brackets and said article supporting and orienting means; a substantially rectangular pyramid having downwardly inclined surfaces suspended immediately above the inclined surface of the orienting means; and brackets extending inwardly from said frame and secured to the four corners of said pyramid for supporting the latter in spaced relation to the walls of the frame, at least one of the spaces between the lower edges of the inclined surfaces of the pyramid and the adjacent walls of the frame constituting a restricted aperture for delivering articles onto the upper end of the inclined surface of said orienting means, said articles being compelled to slide down said inclined surface into the apertures thereof, said apertures having countersinks adapted to orient and deliver the articles to the apertures of the supporting means due to the agitation of the article supporting and orienting means.

2. In a machine for orienting and distributing bullets, the combination with an inclined table and means for agitating said table; of a bullet transfer plate supported on said inclined table and agitated thereby; a bullet orienting plate mounted on said transfer plate, said orienting plate comprising a block having apertures and countersinks in the upper surface thereof concentric with the apertures of said bullet transfer plate for orienting and delivering the bullets into said transfer plate; means for delivering bullets onto the inclined surface of said orienting plate comprising a frame supported by said inclined table having walls circumscribing said transfer plate and orienting plate; and a substantially rectangular pyramid suspended by said frame in spaced parallel relation above the inclined surface of said orienting plate, the surfaces of said pyramid being inclined downwardly and spaced at their lower edges from the adjacent walls of the frame, the spaces thus formed constituting restricted apertures for delivering the

bullets onto the inclined surface of the orienting plate.

3. An apparatus for distributing articles comprising a member having apertures therein, each aperture being arranged to support an article and in segregated relationship to other articles in the apertures of said member; a plate supported on said member having article orienting apertures, each aperture being in alignment with an aperture of said member; and feed means supported above said plate constructed and arranged to deliver articles in a substantially single layer onto said plate.

4. An apparatus for distributing articles comprising a member having apertures therein, each aperture being arranged to support an article and in segregated relationship to other articles in the apertures of said member; a plate supported on said member having article orienting apertures, each aperture being in alignment with an aperture of said member; feed means supported above said plate constructed and arranged to deliver articles in a substantially single layer onto said plate; and means to agitate said member, said plate and said article feeding means.

5. An apparatus for distributing articles comprising a member having apertures therein, each aperture being arranged to support an article and in segregated relationship to other articles in the apertures of said member; a plate supported on said member having article orienting apertures, each aperture being in alignment with an aperture of said member; and article feeding means comprising a substantially rectangular pyramid suspended above said plate having downwardly inclined substantially planar surfaces and a frame circumscribing said member and said plate, said frame comprising substantially vertical walls and brackets projecting inwardly therefrom and secured to the four corners of said pyramid to support the lower edge of each planar surface a predetermined distance from the adjacent wall of said frame to provide a restricted aperture to deliver a single layer of articles onto said plate.

6. An apparatus for distributing articles comprising a member having apertures therein, each aperture being arranged to support an article and in segregated relationship to other articles in the apertures of said member; a plate supported on said member having article orienting apertures, each aperture being in alignment with an aperture of said member; article feeding means comprising a substantially rectangular pyramid suspended above said plate having downwardly inclined substantially planar surfaces and a frame circumscribing said member and said plate, said frame comprising substantially vertical walls and brackets projecting inwardly therefrom and secured to the four corners of said pyramid to support the lower edge of each planar surface a predetermined distance from the adjacent wall of said frame to provide a restricted aperture to deliver a single layer of articles onto said plate; and means to agitate said member, said plate and said frame to compel articles to slide down the planar surfaces of said pyramid through said restricted apertures and into the orienting apertures of said plate.

7. An apparatus for distributing articles comprising a member having apertures therein, each aperture being arranged to support an article and in segregated relationship to other articles in the apertures of said member; a plate supported on said member having article orienting

apertures, each aperture being in alignment with an aperture of said member; article feeding means comprising a substantially rectangular pyramid suspended above said plate having downwardly inclined substantially planar surfaces and a frame circumscribing said member and said plate, said frame comprising substantially vertical walls and brackets projecting inwardly therefrom and secured to the four corners of said pyramid to support the lower edge 10

of each planar surface a predetermined distance from the adjacent wall of said frame to provide a restricted aperture to deliver a single layer of articles onto said plate; means to support said member, said plate and said frame comprising a table having an inclined planar surface; brackets on said table to hold said member on the inclined surface thereof; and means to agitate said table.

MURL D. MAYBERRY.