

Aug. 15, 1944.

A. H. GROVER

2,355,643

MEANS FOR POSITIONING OBJECTS

Filed Aug. 7, 1942

2 Sheets-Sheet 1

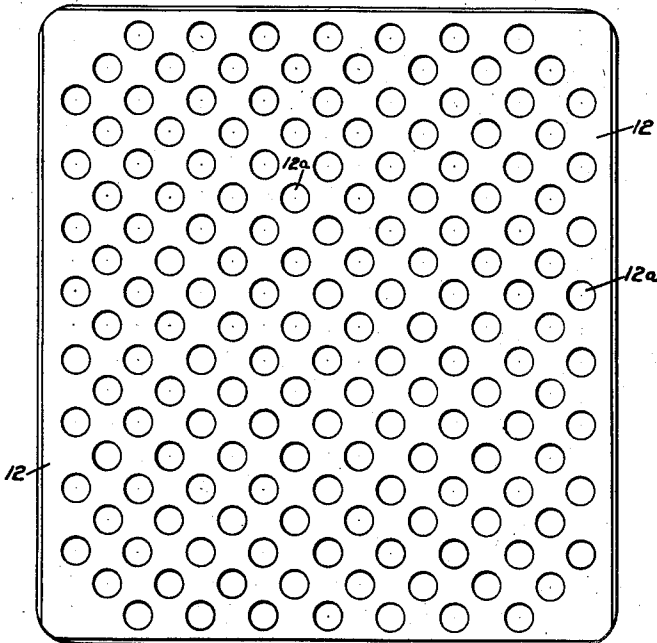
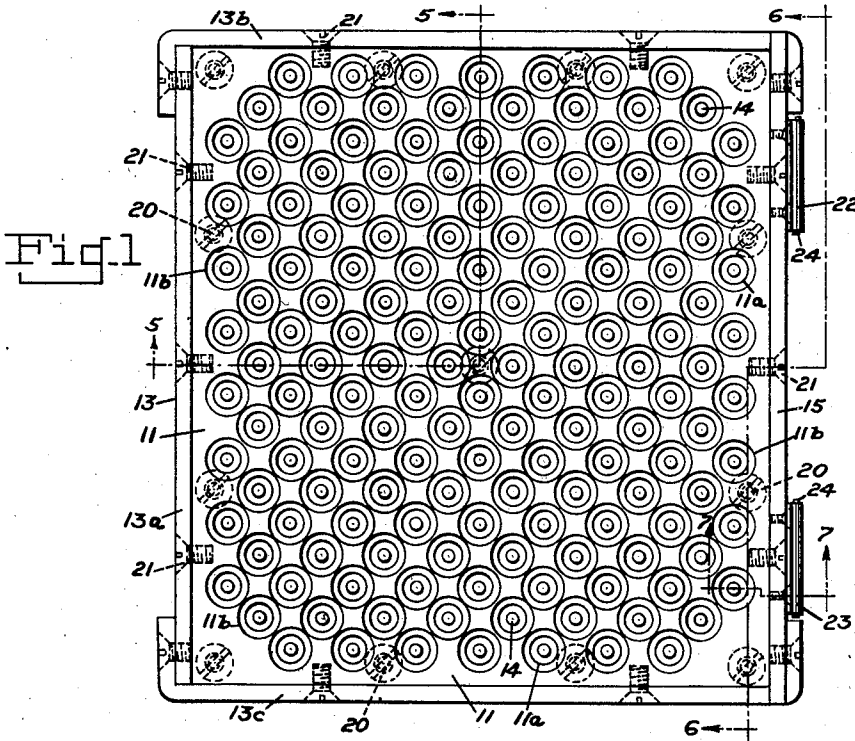


Fig. 4



Fig. 5



Fig. 6



Inventor
Atwood H. Grover

Fig. 2

By *E. Kessnerich & W. E. Thibodeau*
Attorneys

UNITED STATES PATENT OFFICE

2,355,643

MEANS FOR POSITIONING OBJECTS

Atwood H. Grover, Rockaway, N. J.

Application August 7, 1942, Serial No. 454,080

7 Claims. (Cl. 214—1)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to means for positioning objects.

An object of this invention is to provide apparatus for quickly orienting bodies in a given direction from a condition in which the bodies are oriented in random directions with respect to themselves and with respect to said given direction.

Another object of this invention is to provide apparatus for orienting the position of bodies; simultaneously, some of the bodies undergo a separation as they are oriented.

In particular, this invention has application and relates to means for the separation and racking of small cups or tubes having one open end and one closed end, or one open end and one partially closed end; this invention may also be applied in the separation and racking of bodies not containing hollow portions.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawings in which:

Figure 1 is a plan view of apparatus embodying a preferred form of my invention, but with the racking tray removed.

Figure 2 is a plan view of the racking tray surface which is placed in adjacent relationship to the surface shown in Figure 1.

Figure 3 is a plan view of the pin plate 10 which lies behind the guide block 11 shown in Figure 1 and which is normally permanently assembled thereto by fastening means similar to screws 20.

Figure 4 is a side view of one of the bullet shaped pins which is normally held on the pin plate 10 in semi-fixed relationship as by means of a press fit between pin shank 14a and pin plate hold 10a.

Figure 5 is a sectional view taken substantially on corresponding lines 5—5 of Figure 1 but with the racking tray 12 of Figure 2 mounted in position.

Figure 6 is a sectional view taken substantially on corresponding lines 6—6 of Figure 1 but with the racking tray of Figure 2 mounted in position.

Figure 7 is a sectional view taken substantially on line 7—7 of Figure 1 but with the racking tray of Figure 2 mounted in position; the flap 15 is

shown in dotted lines in its other extreme position.

Figure 8 is a perspective view partly broken away of one of the plurality of objects which may be separated and oriented by using the apparatus of Figures 1-7.

Figure 9 is a perspective view of a solid cylindrical object which may also be separated and oriented by using the apparatus of Figures 1-7 provided the pins 14 are not assembled on the pin plate 10.

The apparatus of Figures 1-7 comprise the following elements: pin plate 10, guide block 11, racking tray 12, flange 13 (comprising elements 13a, 13b, 13c), pins 14, and flap 15 mounted on guide block 11 so as to cooperate with flange elements 13a, 13b, 13c in inclosing a predetermined area corresponding to the area of racking tray 12.

The pin plate 10 is joined to guide block 11 by fastening means similar to screws 20 and flange elements 13a, 13b, 13c are joined to guide block 15 by fastening means similar to screws 21.

Flap 15 is mounted on the guide block 11 by means of a pair of hinges 22, 23. The hinges 22, 23 may be of any of the well known types as long as they allow the flap 15 to assume the two extreme positions shown in Figure 7. The particular hinge 22 shown herein and which is a duplicate of hinge 23 is of the type which comprises two parts 22a, 22b interlinked by means of a common cylindrical pin 24.

The pin plate 10 has pins 14 shown in Figure 4 fastened thereto by press fitting when objects of the type shown in Figure 8 are to be separated and/or oriented; pins 14 are not mounted on pin plate 10 when objects of the type shown in Figure 9 are to be separated and/or oriented.

It is noted that guide block 11 has a plurality of hollow cylindrical portions 11a therein having a diameter or opening correspondingly greater than the dimensions of the objects, which are to be separated and/or oriented. The hollow portions 11a are preferably joined by a flared portion 11b which serves as a guide for movement of objects to be separated and/or oriented into the hollow portions 11a.

It is also noted that pin 14 has a nose shaped like that of a bullet with a minute radius provided for the point and an intermediate curvature starting down four fifths of the diameter of the pin, the radius of said curvature being three eighths larger than the diameter of pin 14. When the pin 14 is assembled on the pin plate 10 it is noted that the extreme end of the pin nose

extends a small distance into the space defined by the guide block flared section 11b.

Objects are separated and/or oriented by the following expedient. Initially a bulk lot of components or objects are placed on the upper face of the guide block with the flap 15 held up in the vertical position shown in full lines in Figure 7 so that the components or objects may be brushed back and forth over the upper guide block face within the inclosed area defined by flange 13 and flap 15. In the back and forth motion of the components or objects over the guide block face eventually the open end of a hollow object or component finds its way over the nose of pin 14 and then quickly falls into the hollow portion defined by guide block portion 11a. The excess objects or components are then brushed off the block guide upper face very conveniently by brushing them in the direction of flap 15 but with the flap in the downward position shown in dotted lines in Figure 7. Racking tray 12 having indentations 12a in one face thereof in exact geometric pattern as the hollow guide block portions 11a is then placed on the guide block upper face with indentations 12a facing downward; the racking plate is automatically centered on the guide block when flap 15 is raised to its upper position shown in full lines in Figure 7 and immediately thereafter the complete assembly is turned over so that the objects to be separated and/or oriented rest upon the racking tray 12 in the racking tray indentations 12a. The guide block is then separated from the racking tray 12 by raising the guide block 11 upward with the racking tray 12 conveniently resting upon a table (not shown) or other suitable support.

I claim:

1. Apparatus for positioning objects comprising, a plate having a plurality of pins mounted thereon in spaced relationship and with pin axes substantially mutually parallel, a guide block mounted on the plate and having a hollow cylindrical portion surrounding a corresponding pin, a tray mounted on the guide block, said tray having a plurality of spaced hollow portions each of which is aligned with the axis of a corresponding pin.

2. Apparatus for positioning hollow objects comprising a plurality of pins, means for mounting the pins in spaced relationship to one another and with pin axes substantially mutually parallel, said pins being adapted to be inserted into the hollow objects, means adapted to guide the objects in inserted relationship to the pins, a tray having indentations therein, and means for mounting said tray with its indentations aligned with the corresponding axes of the pins.

3. Apparatus for positioning hollow objects comprising, a plate having a plurality of pins mounted thereon with their axes substantially mutually parallel, a guide block having a plurality of hollow portions each of which at least partially surrounds a corresponding pin, said block hollow portions terminating in a flared portion adapted to guide the hollow objects, said pin being adapted to be inserted into the hollow objects, a tray having indentations therein and guide means for positioning each tray indentation in aligned position with a corresponding pin.

4. Apparatus for positioning objects comprising, a guide block having a plurality of hollow portions therein with their axes substantially mutually parallel each hollow portion having a pin centrally located therein, a tray having indentations therein, and means for aligning the tray indentations with corresponding block hollow portions.

5. Apparatus for positioning objects comprising, a guide block having a plurality of hollow portions therethrough with their axes substantially mutually parallel, a plate contacting the guide block and closing one end of each of the hollow portions, the opposite ends of the hollow portions each having a flared portion, pins mounted on the plate and one of each extending centrally within a corresponding block hollow portion, said pins extending somewhat less than the length of the block hollow portions and each having a pointed end adjacent said flared portion, a flange mounted on the block, a flap mounted on the block, and a tray having indentations therein each of which are adapted to be aligned by cooperation of the flap with the flange.

6. An apparatus for positioning objects comprising a guide block having a plurality of hollow portions with their axes substantially parallel, a tray having indentations therein, a flap mounted on the block and forming a flange in one of its movable positions, means including the flap for aligning the tray indentations with corresponding hollow block portions, and a pin centrally mounted in corresponding block hollow portions.

7. An apparatus for positioning objects comprising a guide block having a plurality of hollow portions with their axes substantially parallel, a tray having indentations therein, a flange on the block, a flap mounted on the block, said flap and flange serving to align the tray indentations with corresponding block hollow portions, and a pin centrally mounted in corresponding hollow block portions.

ATWOOD H. GROVER.