

July 24, 1962

K. J. HURST ET AL
ARTICLE COUNTING DEVICE

3,045,864

Filed June 25, 1959

2 Sheets-Sheet 1

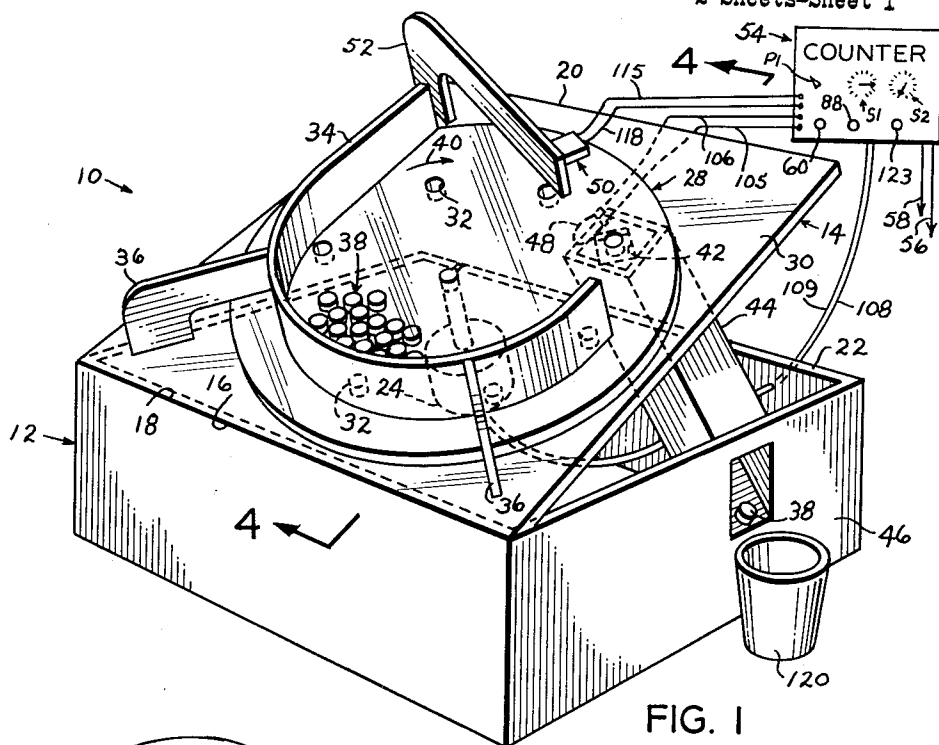


FIG. 1

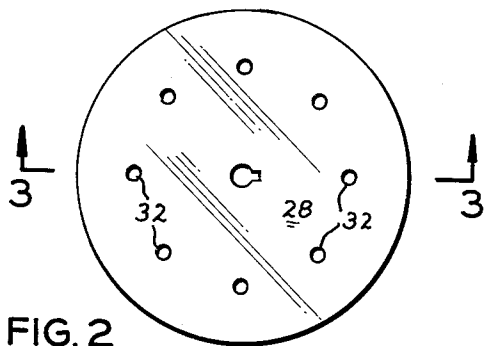


FIG. 2

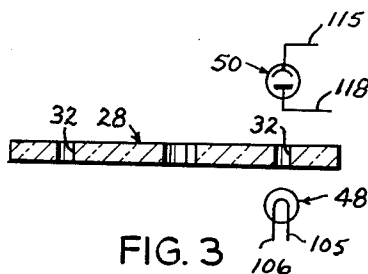


FIG. 3

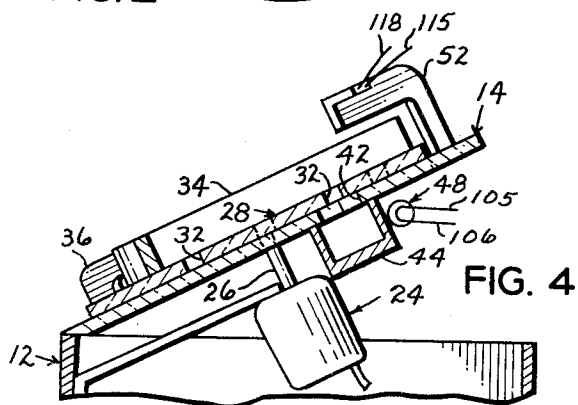


FIG. 4

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2 Sheets-Sheet 2

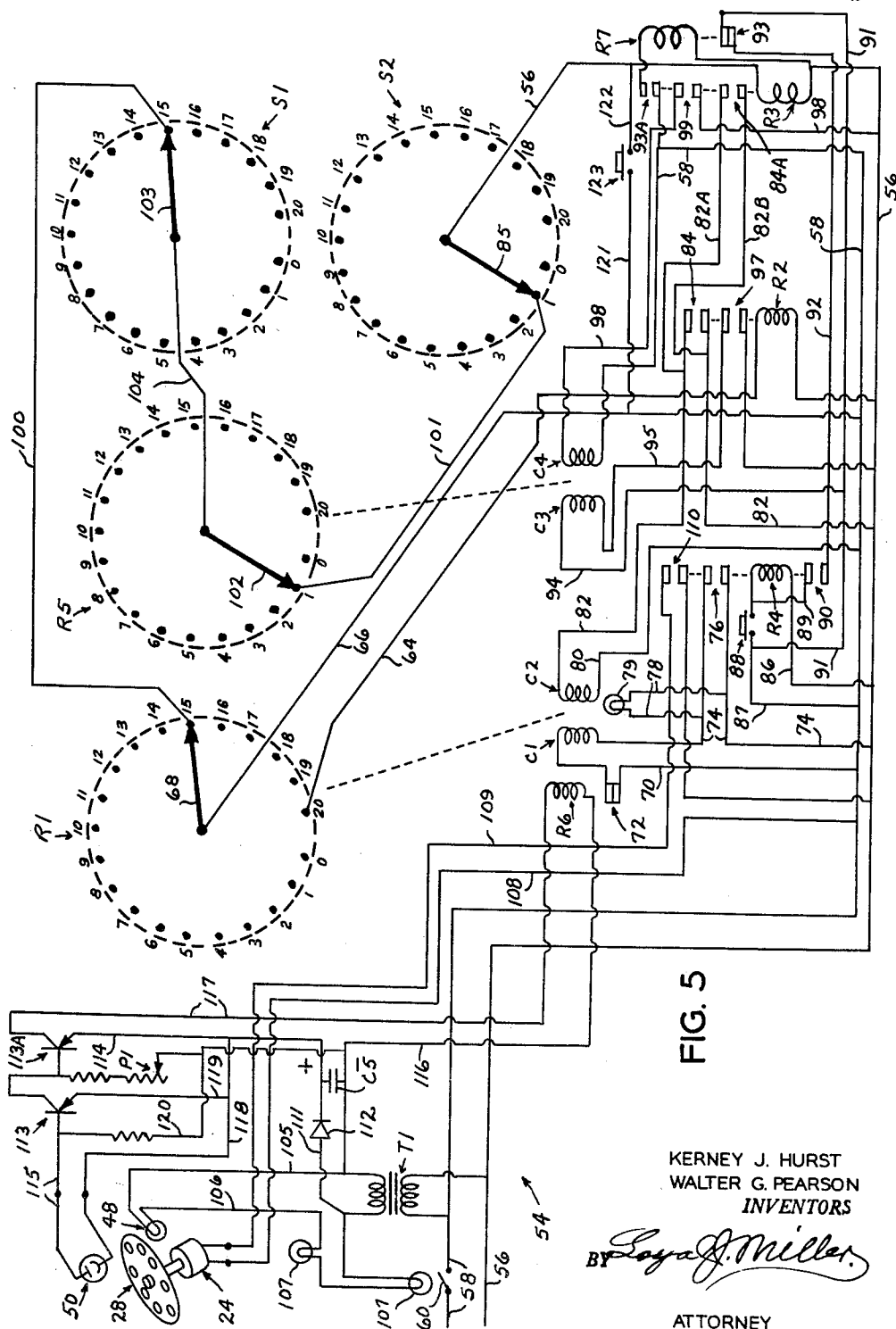


FIG. 5

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1

3,045,864

ARTICLE COUNTING DEVICE

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7 Claims. (Cl. 221-7)

The present invention relates to machines for counting articles such as pills, tablets, capsules or any other small article of similar nature.

Considerable valuable time is consumed by pharmacists in the tedious operation of counting the exact number of pills or tablets required to fill individual prescriptions particularly so where the volume of prescriptions being filled is relatively large.

The prior art reveals a number of counting machines adapted to count a predetermined number of pills or tablets and deposit them in separate containers, some of which are progressively conveyed past the counting device. Some of these counting devices are designed for use by the manufacturer of such pills or tablets, rather than by the individual pharmacist, wherein each successive prescription filled has a number of pills or tablets which is different from the previously filled prescription. These machines, as shown by the prior art, so far as we have been able to determine, do not provide a device capable of being actuated for counting a selected number of pills for individual prescriptions. It is highly important in the handling of pharmaceutical tablets, which are to be internally consumed, that the tablets be undamaged and be kept clean to present a perfect appearance to the consumer.

It is, therefore, the principal object of the instant invention to provide a machine or device which will actually count or separate a selected number of pills or tablets from a hopper containing a reserve supply.

Another object is to provide a device which will count a selected number of articles without any damage thereto.

Another object is to provide a counting machine which is controlled by a preset electronic means for counting out the predetermined number of articles.

A further object is to provide a device which is fully automatic in operation and does not require manual supervision once the machine has been placed in operation.

Another object is to provide a machine adaptable for handling articles of various shapes and sizes.

Still another object is to provide a machine of this class which is relatively simple in construction, positive in operation, and which can readily withstand continuous usage with a minimum of service or repair.

A further object is to provide a device of this class which may be readily used by pharmaceutical manufacturers, or the like, in counting out a large volume of pills, or the like.

Yet another object is to provide a device of this class which may comprise a single unit, or a multiplicity of such units, all electronically controlled wherein a plurality of counting operations may be performed simultaneously.

The present invention accomplishes these and other objects by providing a frame on which is mounted an inclined support formed of transparent material. A motor is mounted within the frame with its drive shaft projecting upwardly through the central portion of the support. A disk of transparent material is axially connected to the motor drive shaft in face to face contact with the upper slanting surface of the support. The disk is provided with a row of article receiving apertures therethrough spaced inwardly of its periphery. An arcuate upstanding wall or barrier is supported by the support, in contact with the upper surface of the disk, to form an article

2

receiving hopper. An opening is formed through the support, below the path of travel of the row of apertures, and an elongated tube or chute is connected with the lower surface of the support around the opening and extends outwardly of one wall of the frame, for conveying articles carried and released by each aperture of the disk as the apertures are rotated across the opening. A small lamp is placed below the support in co-operation with a photoelectric cell, positioned above the disk on opposing sides of the path of travel of the apertures. Electronic counting means, connected with a source of electric energy, operates the motor and stops the latter at a predetermined setting which is actuated by interruption of the light rays, from the lamp to the photocell, by the passage of articles carried by the apertures as the disk is rotated, for stopping the motor.

Other objects will be apparent from the following description when taken in conjunction with the accompanying two sheets of drawings, wherein:

FIGURE 1 is a perspective view of the device;

FIGURE 2 is a top plan view of the disk, per se, on a reduced scale;

FIGURE 3 is a cross-sectional view taken substantially along line 3-3 of FIG. 2 illustrating the relative position of the lamp and photocell to the apertures in the disk;

FIGURE 4 is a fragmentary, vertical, cross-sectional view, on a reduced scale, taken substantially along the line 4-4 of FIG. 1; and,

FIGURE 5 is a wiring diagram of the electronic counting means.

Like characters of reference designate like parts in those figures of the drawings in which they occur.

In the drawings:

Referring to FIG. 1, the reference numeral 10 indicates the device, as a whole, including: a rectangular frame 12 which supports a stationary plate or support 14 preferably formed of transparent material. The support 14 is plate like and substantially rectangular in general configuration, having one side edge 16 joined to a co-operating side edge 18 of the frame, and is inclined upwardly so that the opposing side edge 20 of the support lies in horizontal spaced relation above the horizontal upper edge 22 of the frame. A motor 24 is mounted within and supported by the frame 12 and includes a drive shaft 26 which projects centrally upward through the support 14. A disk 28, preferably formed of transparent material, is axially connected to the upwardly disposed end of the drive shaft 26 in flat face to face contact with the upwardly inclined surface 30 of the support 14. The disk 28 is provided with a circumferential row of spaced-apart apertures 32, spaced inwardly a selected distance of its peripheral edge for the purposes more fully explained hereinbelow.

An arcuately curved barrier or upstanding wall 34, connected to the support 14 by brackets 36, is positioned upon the disk 28 along an arc exteriorly of the circumferential row of apertures 32 with the downwardly disposed edge of the wall contacting the upwardly disposed surface of the disk for forming in co-operation of the disk an upwardly open hopper for receiving a plurality of articles 38 to be counted. Thus it may be seen that the articles, such as pills, tablets or the like, are retained by gravity within the hopper adjacent the wall 34. The size of each aperture 32 is such that one, and only one, of the articles or pills 38 is received within the aperture and carried thereby as the disk rotates in the direction shown by the arrow 40.

An opening 42 is formed through the support 14, in cooperating relation beyond the limit of the hopper wall 34 and below the path of travel of the apertures 32, which permits the article or pill 38, carried by the respective aper-

ture, to fall by gravity out of the aperture and through the opening 42 as the disk is rotated. A tube member or chute 44 extends between the support and frame and is connected at one end with the lower surface of the support 14 around the opening 42 and is connected at its opposite end with one wall 46 of the frame for conveying the articles 38 released by the apertures outwardly of the frame wall 46. An electric bulb or lamp 48 is positioned below the support 14 and below the path of travel of the apertures 32 in spaced relation with respect to the opening 42. An electric eye or photoelectric cell 50, supported by a bracket 52, connected with the support 14, which extends inwardly of the periphery of the disk 28, is positioned in spaced relation above the upper surface of the disk 28 in co-operative relation with the lamp 48 with respect to the path of travel of the apertures 32 for receiving a beam of light from the lamp 48 directed transversely of the path of travel of the apertures for the purposes which will readily be apparent.

Referring more particularly to FIG. 5, a counting control or selector mechanism and wiring is indicated generally by the numeral 54 for operating the counting device 10.

The counting control 54 may be housed within the frame 12 or within a separate unit, as shown, and connected to the device 10 by wiring. The counter 54 includes a pair of selector switches S1 and S2 which are manually set by moving the indicator or pointer thereof to a pre-selected number representing the number of pills or tablets to be counted as more fully explained hereinbelow.

An alternating current, connected to a suitable source of electrical energy, not shown, is connected by conductors 56 and 58 to the primary winding of a transformer T1 through an off-on switch 60.

The wires 56 and 58 are connected to a ratchet relay R1 by wires 64 and 66 which are connected, respectively, to the indicator terminal point 20 and the indicator arm 68. A relay R2 is interposed in the wire 64.

A wire 70, connected with the wire 58, is connected to one end of the coil C1 of relay R1 through a pair of normally closed contacts 72, while the other end of the coil C1 is connected by a wire 74 to wire 56 through a pair of contacts 76. A pair of wires 78 joined to the wire 74, on opposing sides of the contacts 76, are connected with a lamp 79 for indicating that current is flowing through the coil C1. The coil C1 advances the indicator 68 of relay R1 in the manner more fully described hereinbelow.

The wire 56 is connected with the indicator 85 of selector switch S2 through the winding of the coil of a relay R3.

The coil C2, of relay R1, is connected by wires 80 and 82 to the wires 56 and 58 through a pair of contacts 84, associated with the winding of relay R2. A pair of wires 82A and 82B are connected to the wire 82 on opposing sides of the contacts 84 and are connected at their respective opposing ends with a pair of contacts 84A associated with the relay R3.

The coil winding of a relay R4 is connected to the wires 56 and 58 by a pair of wires 86 and 87 through a push button switch 88 interposed in the wire 87. A wire 89 is connected to the wire 87 between the switch 88 and the relay R4 and is connected at its other end to one side of a pair of normally open contacts 90 associated with relay R4, while another wire 91, connected with the wire 87 between the switch 88 and the wire 58, is connected to the other contact of the normally open contacts 90 by a wire 92 through a pair of normally closed contacts 93 associated with a relay R7.

A second ratchet relay R5 has one coil C3 connected with the wire 91 by a wire 94 and is connected by a wire 95 to the wire 56 across a pair of normally open contacts 97 associated with the relay R2. The wire 53 is connected to the other coil C4 of relay R5 which is in turn connected with the wire 56 by a wire 98 across a pair

of normally open contacts 99 associated with relay R3. Relay R7 is connected with the wires 56 and 58 through a pair of normally open contacts 93A associated with relay R3.

The indicator dials of the selector switches S1 and S2 and ratchet relays R1 and R5 are each shown as comprising a circumferential row of contact points or poles numbered from 0 through 20.

The numerical value of each pole or contact point of the indicator dials of ratchet relay R1 and selector switch S1 is from 0 through 20 and each of the contact points of this relay and switch are respectively interconnected by wiring, not shown, in the interest of clarity.

The contact points of the indicator dials of ratchet relay R5 and selector switch S2, numbered from 0 through 20, increase in numerical value from one contact to the next adjacent contact by counts of 20. For example, the contact point numbered 0 from these dials has the counting value of from 0 through 20 while the next contact, numbered 1, has the counting value of 21 through 40 and so on around the dial to the contact numbered 19 which has the counting value of 381 to 400.

The contact points of the ratchet relay R5 and selector switch S2 are each interconnected, respectively, by wiring, not shown, for clarity.

The dial indicator 102 of ratchet relay R5 is connected to the dial indicator 103 of selector switch S1 by a wire 104.

By way of example, the contact point 15 of relay R1 is connected with the contact point 15 of the selector switch S1 by a wire 100 and the contact point 1 of relay R5 is connected with the contact point 1 of selector switch S2 by a wire 101.

The secondary winding of transformer T1 is connected with the lamp 48 by wires 105 and 106. Indicator lamps 107 are interposed in series with the lamp 48 in the wire 106.

One terminal of the motor 24 is connected with the wire 58 by a wire 108 and a wire 109 connects the other motor terminal to the wire 56 through a pair of normally open contacts 110 associated with the relay R4. A wire 111, connected with one side of the secondary winding of transformer T1, is connected to a rectifier 112 which has its positive output connected to the photocell 50 through a pair of series connected transistors 113 and 113A by wires 114 and 115.

The other side of the secondary winding of transformer T1 is connected with the rectifier 112 by a condenser C5 and is connected to one terminal of the coil of a relay R6 by a wire 116. The relay R6 operates the contacts 72. The other terminal of the coil of relay R6 is connected by a wire 117 to the transistor 113A. The other terminal of the photocell 50 is connected to the wire 114 by a wire 118.

One terminal of the transistor 113 is connected to the wire 118 by a wire 119. The wire 115 is connected to the wire 116 through a suitable resistor by a wire 120 which is in turn connected to a potentiometer P1 interposed between the transistors. The purpose of the potentiometer is to regulate the sensitivity of the photocell 50.

Operation

In operation a quantity of the pills or articles to be counted is placed within the hopper formed by the wall 34 and disk 28. A predetermined number of pills to be counted, for example 35, is selected by positioning the dial indicator of selector switch S1 on the contact point 15 and positioning the dial indicator 85 of selector switch S2 on the point 1.

The on and off switch 60 is closed which energizes the lamp 48 and photocell 50 from the secondary winding of transformer T1 and energizes the coil of relay R6 which opens the contacts 72.

The sensitivity of the photocell 50 is now adjusted by means of the potentiometer P1 so that sufficient current

5

passes through the coil of relay R6 to maintain the contacts 72 open and so that any interruption of the light beam between the lamp 48 and the photocell lowers the current through the coil of relay R6 thus permitting the contacts 72 to close momentarily. This adjustment is governed by observing the series connected lamp 79. If the filament of this lamp glows, then the contacts 72 are closed and more current is needed through the coil of relay R6.

With the switch 60 closed the push button switch 88 is then manually closed, passing current through the coil of relay R4 from the wires 56 and 58, energizing the coil and closing contacts 76, 90 and 110, thus starting the motor 24 for revolving the disk 28.

Closing of the contacts 90 by-passes the current around the switch 88, through normally closed contacts 93, thus maintaining the coil of relay R4 energized after the switch 88 is released. As the disk 28 rotates, one of the articles or pills 38 is deposited within each aperture 32 and the article 38 interrupts the light beam between the lamp 48 and photocell 50, momentarily deenergizing the coil of relay R6, permitting the contacts 72 to close and energize the coil C1 of relay R1 over the wires 70 and 74 through the closed contacts 76. This coil C1 then advances the indicator 68 of relay R1 from 0 to the point 1. As each succeeding article 38 interrupts the light beam received by the photocell 50 the indicator 68 of relay R1 is similarly progressively moved to each succeeding contact point until it reaches contact point 20. When the indicator 68 of relay R1 reaches contact point 20, a circuit is closed from the wires 56 and 58 over wires 64 and 66 thus energizing the coil of relay R2 and momentarily closing the contacts 84 and 97. Closing of contacts 84 closes a circuit from the wires 56 and 58 over wires 80 and 82 for energizing the coil C2 of relay R1 which returns or resets the indicator 68 to 0 position. Simultaneously the closing of contacts 97 closes a circuit from wires 56 and 58 over wires 94 and 95 thus energizing the coil C3 of ratchet relay R5 which advances the indicator 102 from 0 to point 1. Progressive movement of indicator 68 of ratchet relay R1 is resumed, as disclosed hereinabove, until the indicator reaches the point 15. A circuit is then closed from point 15 of ratchet relay R1 to point 15 of selector switch S1 over wire 100 and from the indicator 103 of selector switch S1 to the indicator 102 of ratchet relay R5 which closes a circuit with the wire 56 between the points 1 of relay R5 and the indicator 85 of selector switch S2 interconnected by wire 101; closing of this circuit energizes the coil of relay R3 closing contacts 84A, 99 and 93A. Closing of contacts 84A completes a circuit through coil C2 of relay R1 over wires 80 and 82 energizing this coil for resetting the indicator 68 to point 0 while the closing of contacts 99 completes a circuit from wire 58 through the coil C4 of ratchet relay R5, over the wire 98 connected with wire 56, which resets the indicator 102 of ratchet relay R5 to point 0. Closing the contacts 93A energizes the coil of relay R7 which opens the contacts 93 and interrupts the circuit through the coil of relay R4 thus permitting contacts 76, 90 and 110 to open.

Thus the relay R7, energized only by the closing of contact points 93A, prevents opening of contacts 93 by a momentary impulse received by the coil of relay R3 when the indicator 68 of ratchet relay R1 passes contact point 15 in its return toward the point 0 before the total count is complete. Opening of the contacts 110 stops the operation of the motor thus terminating the counting procedure with the required number of pills deposited within the container 120.

A pair of wires 121 and 122 are each connected, respectively, with the wire 66 and 56 through a push button switch 123.

The sequence of counting operation may be interrupted to stop the counting operation by simply manually closing the switch 123 thus energizing the coil of relay R3 for

6

stopping the motor and resetting the indicators of ratchet relays R1 and R5 to 0. Thus it seems obvious that any selected number of pills or the like, up to 400, may be counted by proper positioning of the indicators of selector switches S1 and S2.

For example, if a count of 100 pills is desired, the indicator 85 of selector switch S2 is positioned on the point 4 and the indicator 103 of selector switch S1 is left positioned at the point 0. Similarly for a count of 337, for example, the indicator 85 is positioned at the point 16 and the indicator 103 is positioned at 17. It seems equally obvious that the ratchet relays R1 and R5 and selector switches S1 and S2 may be provided with contact points of ten each, rather than twenty, if desired which would reduce the total count possible to 100 pills. Obviously additional ratchet relays and selector switches may be added, if desired, to produce a device capable of counting a greater number of pills than that shown and described.

Different sized or shaped articles or pills, other than circular, as shown, may be readily counted by the machine by simply replacing the disk 28 with a similar disk having apertures therein formed to receive the particular configuration of the articles to be counted.

Obviously the invention is susceptible to some change or alteration without defeating its practicability, and we therefore do not wish to be confined to the preferred embodiment shown in the drawings and described herein, further than we are limited by the scope of the appended claims.

We claim:

1. An article counting device, comprising: a frame; a support of transparent material connected to said frame, said support having an inclined upper surface; a motor mounted within said frame, said motor having a shaft projecting upwardly through the central portion of said support; a transparent disk axially connected with said shaft in face to face contact with the upper surface of said support for rotation with said shaft; an upstanding barrier positioned on and encompassing an arc of the upper surface of said disk forming a hopper adapted to receive and hold a plurality of small articles, said disk having a single circumferential row of apertures spaced inwardly of its periphery, each said aperture being adapted to receive only one of the articles therein as the disk is rotated, said support having an opening disposed below the path of travel of the apertures; an elongated chute connected at one end with the lower surface of said support around the opening therein and connected at its other end with a wall of said frame for removing articles released from said apertures to a point outwardly of the frame; a photocell carried by said support above said disk; a lamp positioned below said support so that articles carried by the apertures in said disk interrupt the light rays between said lamp and said photocell as the disk is rotated; and electrical counting means connected with a source of electrical energy for operating said motor and exciting said lamp and said photocell, said electrical counting means including, a multiple pole selector switch having a manually positioned indicator, a multiple pole ratchet relay having an indicator biased to starting position, wiring interconnecting the poles of said ratchet relay with the respective poles of said selector switch, a relay, make and break contacts associated with said relay, other wiring interconnecting said relay with said ratchet relay through said make and break contacts to stop the motor after a predetermined number of the articles interrupt the light rays between said lamp and said photocell.

2. An apparatus for counting tablets or the like, including: an inclined platform of transparent material; a transparent disk flatly contacting the upper surface of said platform, said disk having a row of circumferential equally spaced apart article receiving apertures; an upstanding wall carried by said platform and co-operating with said disk to form a tablet receiving hopper; motor means for rotating said disk, said platform having an

opening disposed beyond the limit of said hopper and below the path of said row of apertures as the disk is rotated for permitting tablets deposited in said row of apertures to fall therethrough by gravity; a lamp positioned below said platform; a photocell positioned above said platform so that tablets carried by said row of apertures interrupt the light beam of said lamp directed toward said photocell; and electrical circuit means connecting a source of electrical energy with said motor, said lamp and said photocell for stopping said motor after the passage of a predetermined number of tablets through the opening, said electrical circuit means including, at least one multiple pole selector switch having an indicator selectively positioned manually, at least one multiple pole ratchet relay having an indicator biased to a starting position and progressively movable between the poles, a relay associated with said ratchet relay for operating the latter, other electrical wiring interconnecting the poles of said selector switch with the indicator of said ratchet relay and interconnecting said photocell with said ratchet relay and said selector switch whereby the indicator of said ratchet relay is advanced from one pole to the next toward a predetermined setting of said selector switch indicator each time an article carried by said apertures interrupts the light beam between said lamp and said photocell and said motor is de-energized when the indicator of said ratchet relay is advanced to the predetermined setting of the indicator of said selector switch.

3. An article counting device, comprising: a support formed of transparent material and having an inclined upper surface; a motor mounted below said support and having a drive shaft projecting centrally upward through said support; a disk axially connected to said drive shaft in face to face contact with the inclined surface of said support, said disk having a single row of article receiving apertures spaced inwardly of its periphery; an upstanding wall positioned above said disk in contact with the upper surface of the latter for forming an article receiving hopper, said support having an opening therethrough disposed outwardly of the limit of said hopper and below the path of travel of the apertures in said disk; an elongated tube-like member connected at one end with said support around the opening therein for receiving articles released by the apertures as the latter are rotated across the opening; and electronic circuit means connected with said motor and actuated by the passage of articles through said apertures for stopping the motor after the passage of a predetermined number of articles through the opening, said electronic circuit means including, a photocell positioned above the path of travel of the apertures in said disk, a lamp positioned below said support and the path of travel of the apertures in said disk, at least one multiple pole selector switch having an indicator, selectively positioned manually, at least one multiple pole ratchet relay having an indicator biased to starting position and progressively movable between the poles, a relay associated with said ratchet relay for operating the latter, a transformer, electrical wiring connected with a source of electrical energy and interconnecting said motor, said lamp, said transformer, said relay, and said photocell with said ratchet relay and said selector switch, and wiring interconnecting the poles of said selector switch with the indicator of said ratchet relay, whereby the indicator of said ratchet relay is advanced from one pole to the next toward a predetermined setting of said selector switch indicator each time an article carried by said apertures interrupts the light beam between said lamp and said photocell and said motor is de-energized when the indicator of said ratchet relay is advanced to the predetermined setting of the indicator of said selector switch.

4. An article counting device, comprising: a support formed of transparent material and having an inclined upper surface; a motor mounted below said support and having a drive shaft projecting centrally upward through said support; a disk axially connected with said drive

shaft in face to face contact with the upper inclined surface of said support, said disk having a single circumferential row of article receiving apertures spaced inwardly of its periphery; an upstanding arcuate wall positioned above said disk in contact with the upper inclined surface for forming an article receiving hopper, said support having an opening formed therethrough beyond the limit of said hopper and below the path of travel of the apertures as the disk is rotated; an elongated tube-like member connected at one end with the lower surface of said support around the opening therein for receiving articles carried by and released from the apertures as the latter are rotated across the opening; a photocell positioned above said disk; a lamp positioned below said support so that articles carried by the apertures interrupt light rays between said lamp and said photocell as the disk is rotated; and electrical counting means connected with a source of electrical energy for operating said motor and exciting said lamp and said photocell, said electrical counting means being de-energized to stop the motor after a predetermined number of the articles carried by the apertures interrupt the light rays between said lamp and said photocell, said electrical counting means including, at least one multiple pole selector switch having an indicator selectively positioned manually, at least one multiple pole ratchet relay having an indicator biased to a starting position and progressively movable between the poles, a relay associated with said ratchet relay for operating the latter, other electrical wiring interconnecting the poles of said selector switch with the indicator of said ratchet relay and interconnecting said photocell with said ratchet relay and said selector switch whereby the indicator of said ratchet relay is advanced from one pole to the next toward a predetermined setting of said selector switch indicator each time an article carried by said apertures interrupts the light beam between said lamp and said photocell and said motor is de-energized when the indicator of said ratchet relay is advanced to the predetermined setting of the indicator of said selector switch.

5. An article counting device, including: a rectangular frame; a rectangular support formed of transparent material and connected to said frame, said support having an inclined upper surface; a motor mounted within said frame, said motor having a drive shaft projecting centrally upward through said support; a disk formed of transparent material axially connected with said drive shaft in face to face contact with the inclined surface of said support for rotation with said drive shaft; an arcuately curved barrier wall connected with said support and disposed above a circumferential portion of said disk for forming a hopper in co-operation with said disk, said hopper being adapted to receive and hold a quantity of articles to be counted, said disk having a single row of apertures therethrough circumferentially spaced inwardly of its periphery, each said aperture being adapted to receive only one of the articles therein as the disk is rotated, said support having an opening disposed outwardly of the limit of said hopper and below the path of travel of the apertures for releasing the article carried by each respective aperture to fall by gravity through the opening as the latter is rotated across the opening; an elongated chute extending between the lower surface of said support around the opening therein and one wall of said frame for conveying articles released by the apertures to a point exteriorly of the frame; a photocell positioned by said support above the path of travel of said apertures; a lamp positioned below said support so that articles carried by the apertures interrupt the light rays received by said photocell as the disk is rotated; and electrical counting means connected with a source of electrical energy for operating said motor and exciting the filament of said lamp, said electrical counting means including, at least one multiple pole selector switch having an indicator selectively positioned manually, at least one multiple pole ratchet relay having an indicator biased to

starting position and progressively movable between the poles, a relay associated with said ratchet relay for operating the latter, a transformer, electrical wiring connected with a source of electrical energy and interconnecting said motor, said lamp, said transformer, said relay, and said photocell with said ratchet relay and said selector switch, and other wiring interconnecting the poles of said selector switch with the indicator of said ratchet relay, whereby the indicator of said ratchet relay is advanced from one pole to the next toward a predetermined setting of said selector switch indicator each time an article carried by said apertures interrupts the light beam between said lamp and said photocell and said motor is de-energized when the indicator of said ratchet relay is advanced to the predetermined setting of the indicator of said selector switch.

6. An article counting device, including: a frame; an inclined transparent support mounted on said frame; a transparent disk flatly disposed on said support, said disk having one circumferential row of single article receiving apertures spaced inwardly of its periphery; motor means connected with said disk for rotating the latter; barrier means disposed above said disk for forming an article receiving hopper, said support having an opening therethrough disposed beyond the limit of said hopper and below the path of travel of said apertures for the passage of articles through said support when released by said apertures; an elongated tube-like member connected at one end with the lower surface of said support around the opening therein for receiving articles passing through the opening as the disk is rotated; and photoelectric means positioned on opposing sides of said support for directing a beam of light transversely of the path of travel of articles carried by the apertures in said disk, said photoelectric means including, a photocell positioned above the path of travel of the apertures in said disk, a lamp positioned below said support and the path of travel of the apertures in said disk, at least one multiple pole selector switch having an indicator selectively positioned manually, at least one multiple pole ratchet relay having an indicator biased to starting position and progressively movable between the poles, a relay associated with said ratchet relay for operating the latter, a transformer, electrical wiring connected with a source of electrical energy and interconnecting said motor, said lamp, said transformer, said relay, whereby the indicator of said ratchet relay is advanced from one pole to the next toward a predetermined setting of said selector switch indicator each time an article carried by said apertures interrupts the light beam between said lamp and said photocell and said motor is de-energized when the indicator of said ratchet relay is advanced to the predetermined setting of the indicator of said selector switch.

7. An article counting device, including: a frame; a

support of transparent material connected to said frame, said support having an inclined upper surface; a motor mounted within said frame, said motor having a drive shaft projecting upwardly through the central portion of said support; a transparent disk axially connected with said drive shaft in face to face contact with the upper surface of said support for rotation with said drive shaft; an upstanding arcuate wall positioned on and encompassing an arc of the upper surface of said disk for forming a hopper adapted to receive and hold a quantity of relatively small articles, said disk having a single circumferential row of apertures spaced inwardly of its periphery, each said aperture being adapted to receive only one of the articles therein as the disk is rotated, said support having an opening disposed beyond the limit of said hopper and below the path of travel of the apertures; an elongated chute connected at one end with the lower surface of said support around the opening therein and connected at its other end with a wall of said frame for removing articles released from said apertures to a point outwardly of the frame as said disk is progressively rotated; and photoelectric counting means connected to opposing sides of said support and directing a beam of light transversely of the path of travel of articles carried by the apertures in said disk, said photoelectric counting means including, a photocell positioned above the path of travel of the apertures in said disk, a lamp positioned below said support and the path of travel of the apertures in said disk, at least two multiple pole selector switches each having an indicator at least two multiple pole ratchet relays each having an indicator biased to starting position, wiring interconnecting the poles of said selector switches with the poles of said ratchet relays, a transformer, relay operated switches, and electrical wiring connected with a source of electrical energy and interconnecting said transformer with said motor, said photocell, said lamp, and said relay operated switches with said ratchet relays and said selector switches, whereby said ratchet relays are progressively advanced toward a predetermined setting of said selector switches by the passage of articles interrupting the beam of light between said photocell and said lamp and said motor is deenergized to stop the photoelectric counting means when either or both of said ratchet relays are advanced to a predetermined setting of said selector switches.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

July 24, 1962

Patent No. 3,045,864

Kerney J. Hurst et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 9, line 47, before "whereby" insert the following ---
and said photocell with said ratchet relay and said selector switch, and wiring interconnecting the poles of said selector switch with the indicator of said ratchet relay, --.

Signed and sealed this 13th day of November 1962.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents