No. 740,801. PATENTED OCT. 6, 1903.

W. BROUGH.

PILL COUNTING MACHINE.

APPLICATION FILED APR. 30, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

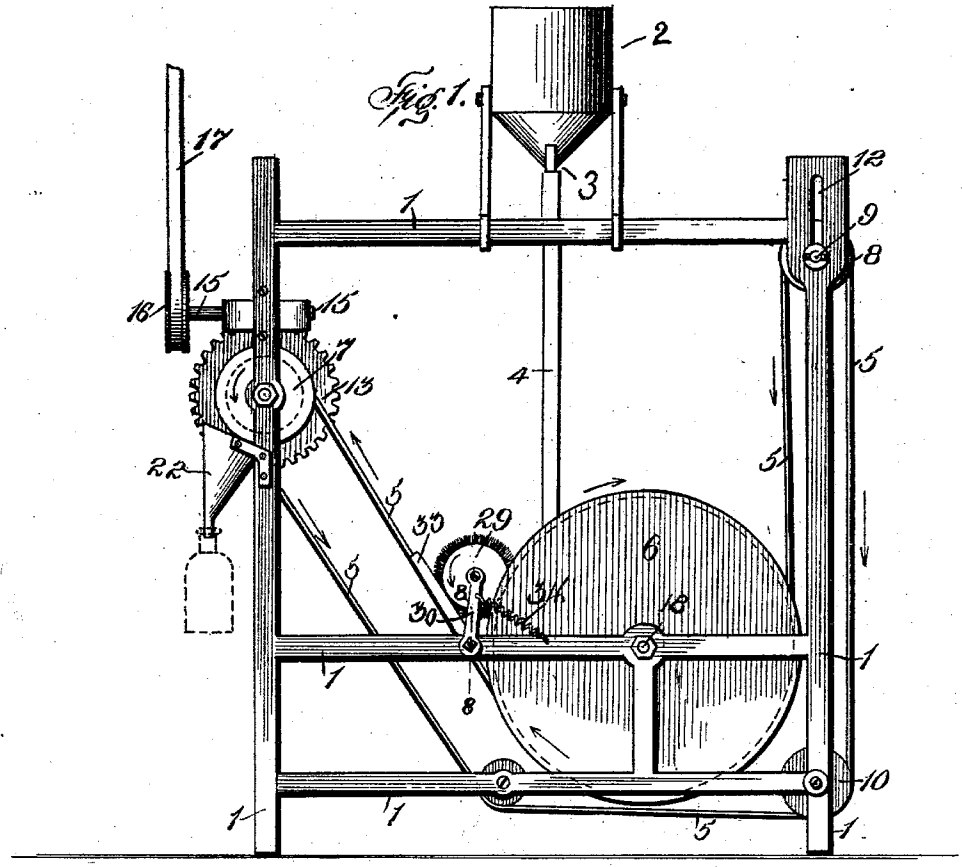


Fig. 2.

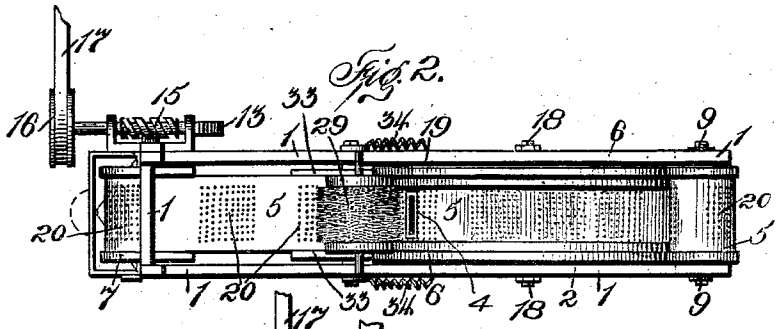
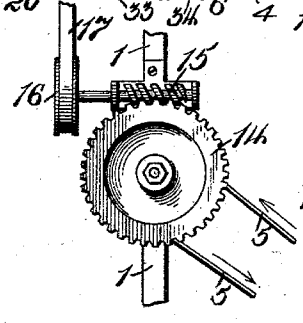


Fig. 3.



WITNESSES:

Wm. C. McKenzie.

Amos W. Hart

INVENTOR

William Brough.

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 740,801. PATENTED OCT. 6, 1903.

W. BROUGH.

PILL COUNTING MACHINE.

APPLICATION FILED APR. 30, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

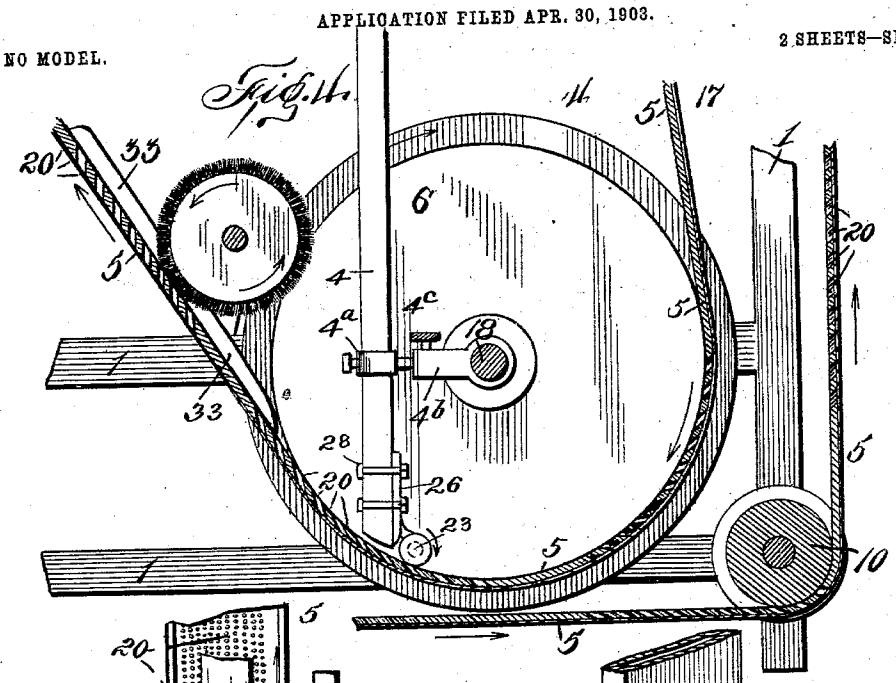


Fig. 5.

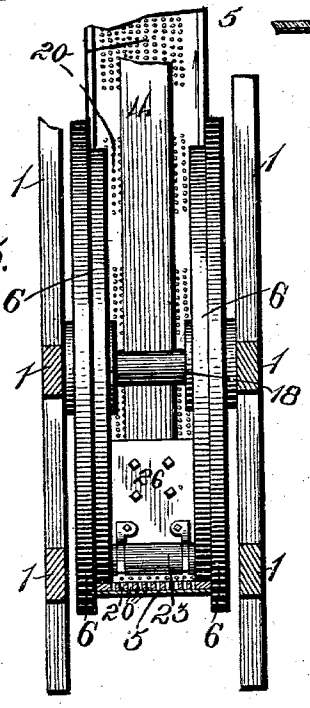


Fig. 6.

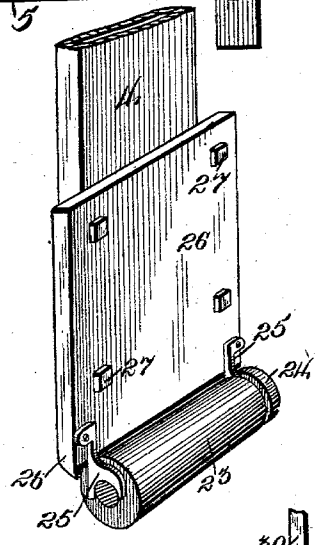


Fig. 7.

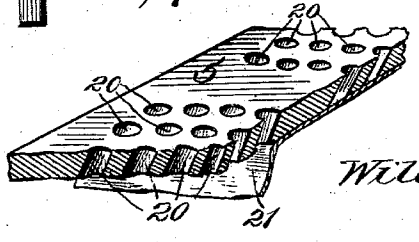
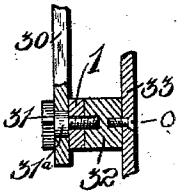


Fig. 8.



WITNESSES:

Wm. C. McKenzie

Amos W. Hart

INVENTOR

William Brough.

BY Munn & Co.

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 740,801. Patented October 6, 1903.

UNITED STATES PATENT OFFICE.

WILLIAM BROUGH, OF BALTIMORE, MARYLAND.

PILL-COUNTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 740,801, dated October 6, 1903.

Application filed April 30, 1903. Serial No. 154,929. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BROUGH, a citizen of the United States, residing at Baltimore, in the State of Maryland, have made certain new and useful Improvements in Pill-Counting Machines, of which the following is a specification.

My improved machine is adapted to count automatically pills or other similar articles rapidly and accurately without injuring the same or allowing adhesion of one to the other.

A distinguishing feature of the machine is an endless traveling belt having groups of pockets for receiving the pills or other articles to be counted, the said pockets being so arranged as to facilitate discharge of the pills at the proper time in the travel of the belt.

Another feature is the provision of a roller in connection with the traveling belt and the discharge end of the spout or tube by which the pills are fed to the belt, whereby the pills are prevented from accumulating in rear of the spout.

Another feature is the provision of a two-part or divided pulley or wheel over which the belt runs and between whose members the pill-spout is arranged and discharges.

Another feature is the arrangement of a rotary brush in connection with the aforesaid belt-pulley for removing any pills that may not be properly pocketed. The brush is operated automatically by running in contact with the aforesaid two-part pulley.

The invention further includes other novel features of construction, arrangement, and combination of parts, as will be hereinafter described.

In the accompanying drawings, two sheets, Figure 1 is a side view of the machine. Fig. 2 is mainly a plan view of the same, the hopper being omitted. Fig. 3 is a side view of the worm-gear for driving the endless belt. Fig. 4 is a longitudinal section of a portion of the machine. Fig. 5 is a vertical transverse section of the machine. Fig. 6 is a perspective view of the attachments of the pill-feeding spout or tube, the roller 23 being cut through at one end at the point of conjunction with the bracket 25. Fig. 7 is a perspective sectional view of a portion of the traveling belt. Fig. 8 is a detail section.

The working parts of the machine are arranged in a light but strong rectangular frame 1. The pills or other articles to be counted are placed in a hopper 2, which is provided with a discharge-nozzle 3, by which the pills are conducted into the vertical tube or spout 4. As shown in Fig. 4, this spout extends down to the endless traveling belt 5, its lower or discharge end being arranged in front of the central axis of the pulley or wheel 6, whereby the pills or other articles are discharged upon a downwardly-inclined portion of the belt, which arrangement facilitates entrance of the pills into the pockets formed in the belt, whose travel is in the direction indicated by the arrows. The belt runs on a series of pulleys, as indicated. The driving-pulley 7 is mounted on a suitable axle in the front upper portion of the frame 1, and the corresponding pulley 8 is mounted upon an axle 9 in the upper right-hand corner of the frame. The upper bight of the belt 5 runs on the two-part pulley or wheel 6, which thus virtually constitutes an idler, and the outer bight of the belt runs on pulleys 10 and 11, which are suitably journaled in the lower portion of the frame and serve to hold the outer bight out of contact with the idler 6. The tension of the belt 5 may be regulated by adjusting the axle 9 of the upper pulley 8 higher or lower in the frame, whose rear bars are provided with a vertical slot 12 to permit such adjustment. A nut is applied to the axle 9 for clamping it in any required adjustment. The pulley 7 is provided with a worm-wheel 13, (see Figs. 1 and 3,) which engages a horizontal worm-shaft 15, having a driving-pulley 16, on which runs a power-belt 17.

The two-part pulley or wheel 6 is keyed upon a transverse shaft or axle 18, which has its bearings in a transverse bar of the frame 1. The wheel is composed, in fact, of two large disks which are rabbeted on their inner edges, as shown at 19, Fig. 2. They are separated by a considerable space, which is practically the width of the belt 5—that is to say, the belt runs on the inner rabbeted or reduced portions of the wheel 6, whose flanges or outer portions project past the belt and serve as guides for holding the latter in due position. The belt is provided with groups of perforations 20, the same preferably numbering one hundred. As shown in Fig. 2, the

groups are arranged in squares of rows counting ten each way, the groups being separated by imperforate spaces or portions of the belt. As shown in Figs. 4 and 7, the perforations 20 extend completely through the belt, and a strip of linen or other light fabric 21 is cemented or otherwise suitably secured to the under side of the belt. Thus the perforations form, in fact, so many pockets for pills or other articles to be counted. As indicated in Figs. 4 and 7, the perforations are all inclined to the axis of the belt, the inclination being forward, so that when the belt passes over the driving-pulley 7 the pills will be more easily discharged or freed from the pockets than would be practicable if the perforations were directly at right angles to the belt. As indicated in Fig. 1, the discharge of the pills is into a funnel 22, which in turn delivers them into a bottle or other receptacle that may be provided. It will be seen that since the perforations are arranged in groups of one hundred that number of pills will be discharged together. In other words, there will be an intermittent delivery of one hundred pills.

As shown in Fig. 4, the bottom of the discharge-spout or pill-conductor 4 approaches as near the belt 5 as the size of the pills will permit, and a roller 23 is attached and works in contact with the belt, so that the forward movement of the upper bight of the belt effects rotation of the said roller in the reverse direction, as indicated by the arrow. The roller is provided with circumferential grooves 24 near its ends, (see Fig. 6,) and these grooves receive the fingers or claws of holders 25, which are in turn secured to a metal plate 26, the latter being secured by bolts 27 to the spout 4. As shown in Fig. 4, the bolts pass through cross-bars 28 on the opposite side of the spout 4, and by these means clamps are formed which permit the roller to be adjusted higher or lower relative to the lower end of the said spout. Thus provision is made for adjusting the lower end of the spout at a greater or less distance from the belt, as may be required by difference of size of the pills or other articles. The spout 4 is made adjustable vertically, it being slidable in a keeper or sleeve 4^a, which is provided with a tenon adapted to enter a socket 4^b, which is supported upon the wheel-shaft 18. Clamp-screws 4^c are provided for securing the parts in any required adjustment. In case any pills fail to become pocketed and pass in rear of the spout 4 the roller 23 will carry or roll them along on the belt by reason of the upward movement of the front side of the roller, so that they do not escape past the latter.

In front of the two-part pulley or wheel 6 is arranged a rotary brush 29, whose end disks or heads run in contact with the inner shoulders or rabbeted portions of the pulley-disks 6. In other words, the brush is made of such length that its heads fit between the outer flanges or rims of the pulley-disks 6. It will thus be seen that the brush will be rotated in the opposite direction to the wheel, as indicated by arrows in Figs. 1 and 4. The brush is supported in such position by means of arms or bars 30, which are in turn journaled on the same cross-bars of the frame that support the pulleys 6. As indicated in Fig. 8, the said arms 30 are pivoted by means of screws 31, which have polygonal heads and a rounded or cylindrical portion 31^a, upon which the arms 30 are journaled. The said screws enter blocks 32, arranged on the inner sides of the frame-bars 1, and thus hold said blocks firmly in place. To the inner sides of the block are attached narrow elongated strips 33, of wood or metal, (see Figs. 1 and 4,) which extend down between the wheels 6. These strips serve as side guides for the belt and form, in effect, a trough at that point, whereby the pills which may be removed from the belt by means of the brush 29 are prevented from falling off laterally and are carried downward on the belt toward the next or approaching group of pockets 20. In order to hold the heads of the brush 29 in duly firm contact with the pulley 6, spiral or coil springs 34 are attached to the brush-arms 30 and the frame 1, as shown in Fig. 1.

By the described construction, arrangement, and combination of parts I form a simple, easily-operated, and accurate machine for the purpose indicated.

What I claim is—

1. The combination, with a frame, of an endless belt having pockets, end pulleys upon which the belt travels, an intermediate wheel on which the belt runs, and a pill-conducting spout or tube arranged to discharge upon the inner upper bight of the belt, substantially as shown and described.

2. The combination, with a suitable frame, of an endless belt having pockets for the articles to be counted, the end pulleys, and intermediate pulleys upon which the belt travels, one of the intermediate pulleys being made in two separated parts, and a pill-conducting spout or tube arranged between said parts for discharging pills upon the belt, substantially as shown and described.

3. The combination, with a suitable frame, of an endless belt having pockets to receive the pills to be counted, and pulleys upon which the same is mounted and adapted to run, and the pill-conducting spout arranged as shown with its discharge end at a point where the upper bight of the belt is inclined downward, substantially as shown and described.

4. The combination, with a suitable frame, of an endless traveling belt provided with pockets, end pulleys on which the belt runs, and an intermediate pulley made of two separated parts and placed at a lower point than said end pulleys, and a pill-conducting spout arranged between the two disks or side portions of the intermediate pulley and with its

discharge end located at a point in front of the lowest portion of said pulley, substantially as shown and described.

5. The combination, with a suitable frame, and the endless traveling belt having pockets as described, end pulleys on which the belt runs, an intermediate pulley or idler, of a pill-conducting spout having a roller attached to its lower end which runs in contact with the belt, substantially as shown and described.

6. The combination, with end pulleys and a two-part pulley, of an endless belt traveling on the end pulleys and intermediately over the two-part pulley, and a pill-conducting spout arranged for delivering pills upon the belt, and means for supporting and adjusting the spout, substantially as described.

7. The combination with a suitable frame, and pulleys mounted therein, of the endless traveling belt, having pockets as described, and arranged on said pulleys, of an intermediate pulley or idler formed of two disks, a vertical pill-conducting spout arranged for discharging pills upon the upper bight of the belt, and a roller arranged in rear of said spout, and means for securing it adjustably to the latter, substantially as shown and described.

8. The combination, with a suitable frame and pulleys arranged therein, of an endless traveling belt provided with pockets, an idler-pulley arranged between the end pulleys and formed of two separated disks, a pill-conducting spout, a roller arranged in rear of the discharge end of the spout and working in contact with the upper bight of the belt, and a clamp by which said roller is adjustably attached to the spout, substantially as shown and described.

9. The combination, with a suitable frame and pulleys arranged therein, of an endless traveling belt having pockets as described, and running on said pulleys, of an intermediate pulley or idler with which the upper bight of the belt runs in contact, a vertical pill-conducting spout which is vertically adjustable, and a roller secured to the lower end of the spout and working in frictional contact with the upper bight of the belt, substantially as shown and described.

10. The combination, with a suitable frame, and pulleys mounted therein, of an endless traveling belt having pockets as described, and a two-part pulley arranged intermediate of the end pulleys and having rabbets formed on each of its two parts, the upper bight of the belt being arranged to work in contact with the inner periphery of the pulley-disks, and thus inclosed and held in place between the outer flanges of the pulley, substantially as shown and described.

11. The combination, with a suitable frame and pulleys, of an endless traveling belt having pockets for reception of the pills to be counted, a pill-conducting spout arranged for delivering pills upon the upper bight of the belt, and a rotary brush arranged to work in contact with the upper bight of the belt, and located in front of the said spout, substantially as shown and described.

12. The combination, with a suitable frame, of an endless traveling belt provided with pockets, pulleys on which said belt runs, and an intermediate pulley or idler arranged between the end pulleys, and a rotary brush arranged to work in contact with the upper bight of the belt and with the aforesaid idler, substantially as shown and described.

13. The combination, with a suitable frame, and pulleys mounted therein, of an endless traveling belt provided with pockets, a large pulley or idler formed in two parts and arranged intermediate of the end pulleys, a pill-conducting spout arranged between the two parts of the idler, so as to discharge pills upon the upper bight of the belt, a rotary brush arranged in front of the spout and working in frictional contact with both the belt and idler, pivoted supports for said brush and springs for holding the brush in firm contact with the idler, substantially as shown and described.

14. The combination, with a suitable frame, and end pulleys therein, of an endless traveling belt having pockets as described, a large two-part pulley arranged between the end pulleys and having its disks rabbeted as shown, a rotary brush having circular heads arranged between the flanges of the two disks and working in contact with the inner peripheries or shoulders of the disks, its brush portion working in contact with the adjacent portion of the belt, and means for holding the brush in due position, substantially as shown and described.

15. The combination, with a suitable frame and pulleys mounted therein, of an endless belt traveling on said pulleys provided with pockets, a rotary brush arranged to work on the upper bight of the belt, and side guides arranged at that point adjacent to the side edges of the belt, as and for the purpose specified.

16. In a machine for counting pills or similar articles, a belt provided with pockets formed by perforations which are inclined forward, pulleys on which said belt runs, and a spout for discharging pills on the upper bight of the belt, as and for the purpose specified.

17. The combination, with a suitable frame, and pulleys mounted therein, of an endless traveling belt having perforations which are inclined as described, for the purpose of facilitating discharge of the articles to be counted and a pill-discharger arranged above the belt, substantially as shown and described.

18. In a pill-counting machine, the combination with pulleys and a pill-discharge spout, of an endless traveling belt composed of a thick portion having transverse perforations and a thin underlying portion forming the bottom of the perforations, whereby the latter constitute pockets for reception of the

pills or other articles to be counted, substantially as shown and described.

19. The combination, with a suitable frame provided with vertical slots in its front upper corner, of a belt-pulley located at that point and having an axle or shaft which passes through the said slots and is vertically adjustable therein, means for clamping the shaft in any adjustment, an endless traveling belt and other pulleys upon which the same is adapted to run, the said belt being provided with pockets for reception of pills or other articles to be counted, and a pill-conducting spout arranged to discharge upon the upper bight of the belt, substantially as shown and described.

WILLIAM BROUGH.

Witnesses:
AUG. W. BRADFORD,
THOS. KELL BRADFORD.