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A. COLTON.

PILL MACHINE.

No. 525,384. Patented Sept. 4, 1894.

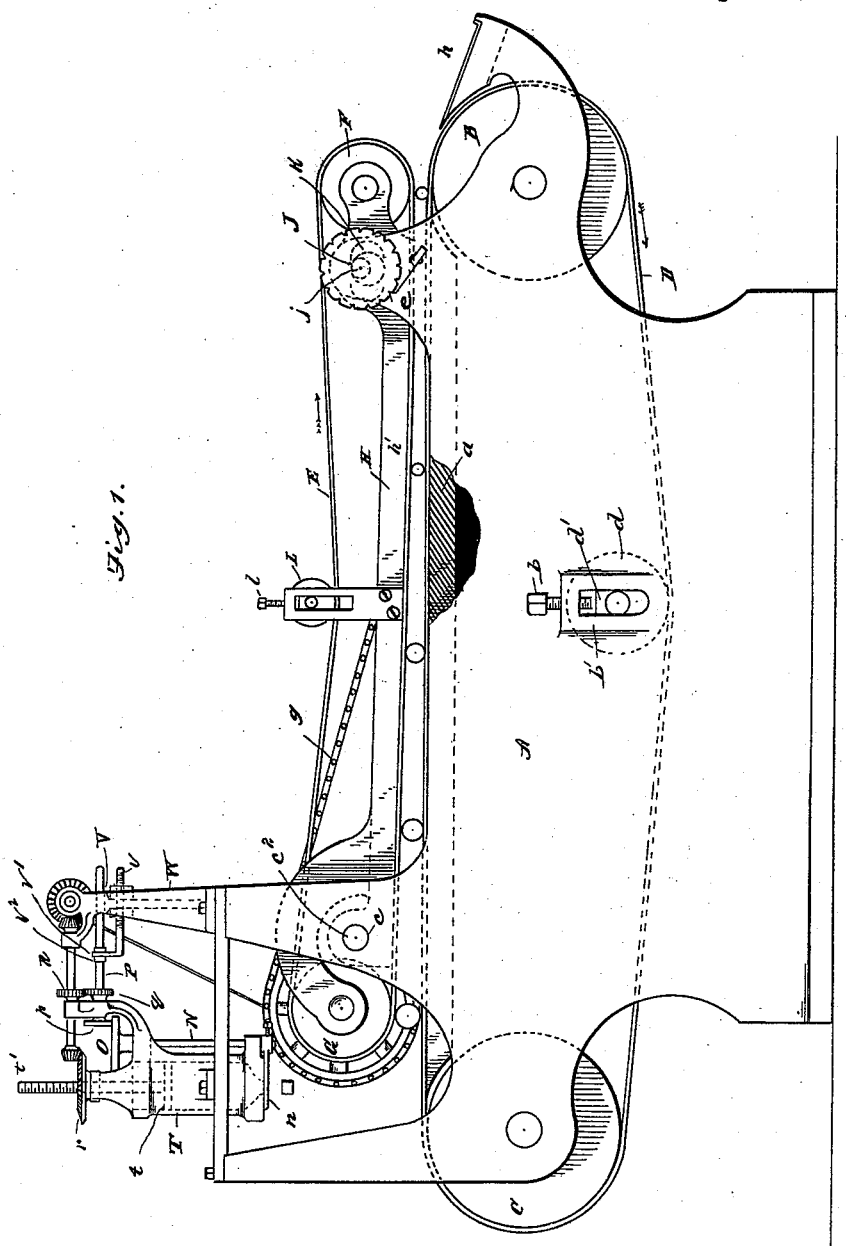

Fig. 1.

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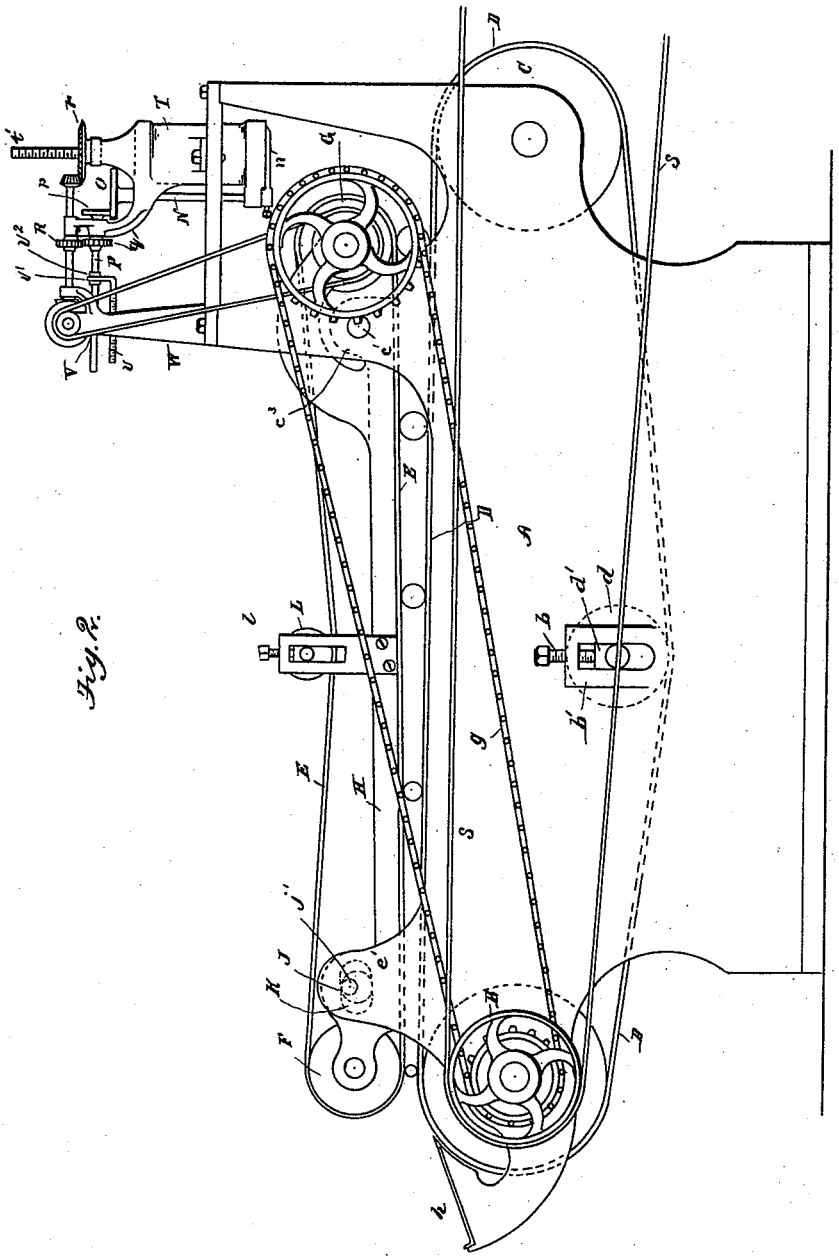

Fig. 2.

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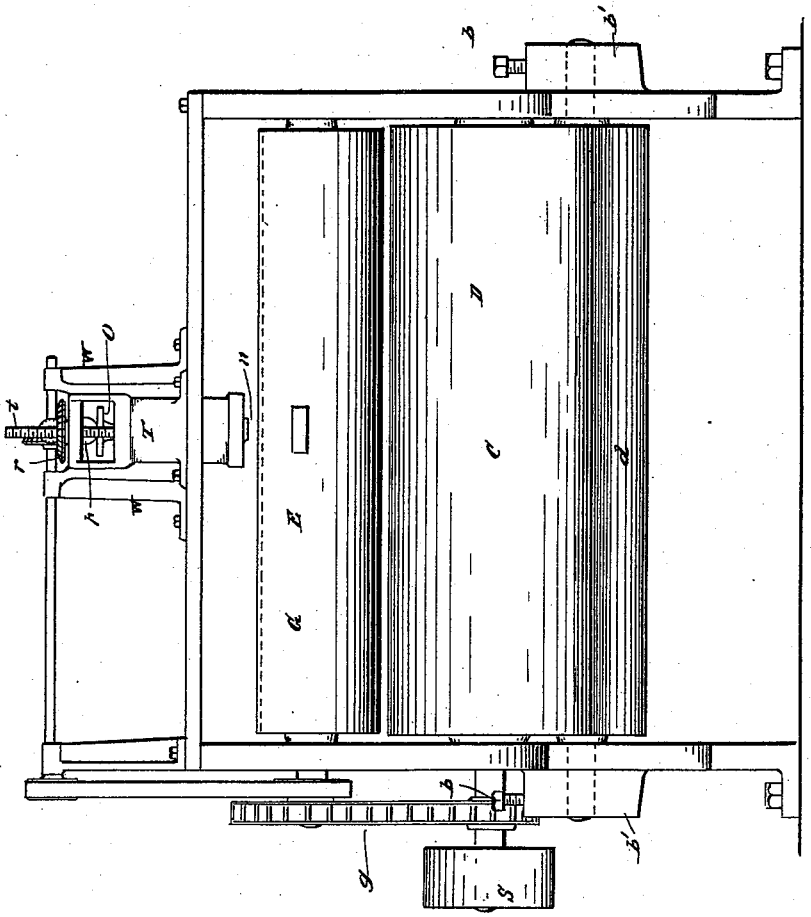
Fig. 3.



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UNITED STATES PATENT OFFICE.

ARTHUR COLTON, OF DETROIT, MICHIGAN.

PILL-MACHINE.

SPECIFICATION forming part of Letters Patent No. 525,384, dated September 4, 1894.

Application filed July 31, 1893. Serial No. 481,924. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR COLTON, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Pill-Machines; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to pill machines, and has for its object an improved machine designed to make what is known as a "pipe" of the dough or mass of which the pill is to be made. This pipe is commonly made by hand, by kneading and rolling the mass on a slab of marble or glass though it has sometimes been made by rolling the dough upon a table under an endless belt, but this required a long table or succession of tables over which the material slowly passed.

In my improved form of machine, I employ an upper and a lower belt moving in opposite directions and at different rates of speed, and the speed being properly regulated the "pipe" is rolled from the feed to the delivery end of the machine, constantly diminishing in diameter, and growing longer until it has attained the proper size, depending on adjustments properly disposed on the machine.

In the drawings, Figure 1, is a side elevation. Fig. 2, is an elevation of the side opposite to that shown in Fig. 1. Fig. 3, is an end elevation, the right end of Fig. 2.

A, indicates the main framework.

B and C, indicate two rollers over which is carried an endless belt or apron D.

d, indicates a straining or tension roll, journaled in adjustable or sliding boxes, *d'*.

a, indicates a table supported by the main frame and resting immediately beneath the upper part of the belt D. The belt D, is horizontal or substantially horizontal, and is quite tightly strained by means of the tension roll, and the tension roll is regulated by a set screw, *b*, which regulates the box *d'*, in its vertical bearing frame *b'*.

Above the portion of framework just described, is a second belt E, supported on rolls F, G; the journals supporting the rolls F, G, are carried at the ends of a plate, H; or on arms rising from the plate H; and the plate H, is itself supported by bearings that are sustained by the main framework, A.

At the front or feed end of the machine, the bearings are in the form of trunnions, *c*, *c'*, which turn in holes in the ears c^2, c^3; at the rear end of the support is a round bar J, with eccentric journals at its ends; the journals *j*, *j'*, turn in holes through the ears *e*, *e'*, and the larger body of the bar J, turns in a slot K, (indicated by dotted lines in Figs. 1 and 2.) The slots K, K', are in the arms that rise from the plate H.

L, indicates a pressure roll supported on brackets that spring from the plate H. The tension of the belt E, is regulated by the pressure roll, L, and the adjusting screws, *l*. The roll B, of the lower set of rolls, is geared to the roll G, of the upper set of rolls by a sprocket chain, *g*, and one of these rolls, as B, receives motion from any convenient source of power by means of the belt, *s*.

The contiguous faces of the belts, D and E, move in opposite directions, and the lower belt, D, with the table which underlies it, extends at the front or feed end a distance forward of the upper belt, and the roll by which it is driven. At the rear end there is a short table, *h*, preferably oblique, upon which the completed pipes are received. The adjustable feature of the upper plate and belt enables me to regulate the size to which the pipe is to be finished.

At the front end of the machine is an automatic feeding device, which is adapted to feed a predetermined amount of mass at regular intervals; this consists of a cylinder T, within which the mass is received and stored. Within the cylinder and above the mass is a follower *t*, provided with a screw, *t'*, and driven by a revolving nut, *r*, geared on its periphery, which receives motion through a pinion connected with the shaft of the roll, G, of the upper set of rolls. At the lower end of the cylinder is a cut off knife, *n*, that wipes off or cuts off a piece of mass at each revolution of the shaft, N, on which it turns.

The shaft N, is vertical, and at its upper end is provided with a crown friction wheel O; which is driven by a friction wheel *p*, on a horizontal shaft, P and the shaft P, is driven

by a gear wheel, q, that meshes with a pinion, R, on the shaft of the gearing by which the nut, r, is driven. The gear q, is secured to the shaft on which it is mounted by a feather, and the shaft can be moved horizontally through said gear, the shaft itself being supported at its rear end in bearings, V, through which it is movable horizontally, and is adjusted horizontally by means of a bent arm, v, one branch of which passes through the vertical support, W, and the other branch of which embraces the shaft, P, between two collars, v', v^2. The horizontal branch is threaded, and is held in position after adjustment by burrs of which there is one on each side of the vertical standard, W. The horizontal adjustment of the shaft P, regulates the location of the friction wheel, p, on the surface of the friction wheel, O, and thus regulates the relative speed of the follower, t, and the knife n.

In operation, the cylinder, T, is filled with a mass of the plastic material from which the pills are to be made, and the machine is set in motion, the mass forced out from the bottom of the cylinder by the follower, t, and is cut off by the knife, n, and drops onto the belt D, it is carried by the belt D, forward until it meets the belt, E, and is then rolled by the two belts gradually moving back to the rear of the machine, and growing smaller as it moves backward until it is finally delivered at the rear of the machine in a long thin cylinder or pipe. The lower belt moves the faster of the two, and thus compels the roll to travel backward with it, but the upper belt moving in the opposite direction gives it a rolling motion which compels it to roll over and over on its own axis during its entire travel. I prefer to bend the surface of one of the supporting plates, as for instance the plate, H, (which is shown in Figs. 1 and 2, to be slightly bent at the point, h',) and I am thus able to adjust the two supporting plates, so that from the front end or mouth between the two plates to the point, h', the distance between them gradually decreases, while between the point, h', and the rear of the machine the two plates are substantially parallel.

It will be observed that in reversing the movement of the contiguous faces of the belts, and by giving the carrying belt a relative greater speed, the "pipes" or rolled mass is quickly carried through the machine, and the entire operation greatly facilitated. It will also be seen that a single adjustment of the belt will affect the workings of the machine, whereas were independent belts and stationary surfaces employed, separate adjustments are required. A further feature of the invention resides in the adaptability of the belts for cleaning or scraping purposes, one of their faces being at all times exposed.

Having described my invention, what I claim is—

1. In a pill machine, the combination of endless traveling belts, of which contiguous faces travel in opposite directions, supporting plates behind said belts, one of said plates being bent, whereby the distance between the plates decreases from the feed end to a point between the feed end and the delivery end and remains constant between said point and the delivery end, substantially as specified.

2. In a pill machine, in combination with belts adapted to roll the mass into pipes, a hopper, means adapted to force the mass through the hopper, a cutting off knife rotating under the mouth of said hopper, and means adapted to vary the relative speed of the belts and knife, substantially as specified.

3. In a pill machine, the combination with two traveling belts having contiguous faces, means for driving the belts in opposite directions at relative different speeds, and adjusting means for varying the inclination of the belts in relation to each other, substantially as described.

4. In a pill machine, the combination of endless traveling belts, of which contiguous faces travel in opposite directions, supporting plates behind said belts, one of said plates being fixed with respect to the main framework, and the other of said plates being hinged at one end to the main framework, and supported in adjustable bearings at the other end, substantially as described.

5. In a pill machine, the combination with a frame, of two supporting and backing plates extending lengthwise of the frame and one arranged above the other, an endless belt surrounding the lower plate and having its upper portion resting on or in proximity to the upper surface of the plate, an endless belt surrounding the upper plate and having its lower portion arranged against or in proximity to the under surface of the upper plate, and means for driving the contiguous portions of the belts in opposite directions at relative different speeds, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

ARTHUR COLTON.

Witnesses:
FRANK X. ROELLINGER,
EFFIE I. CROFT.