M. S. PALMER.

MAKING MEDICAL POWDERS.

No. 32,642. Patented June 25, 1861.

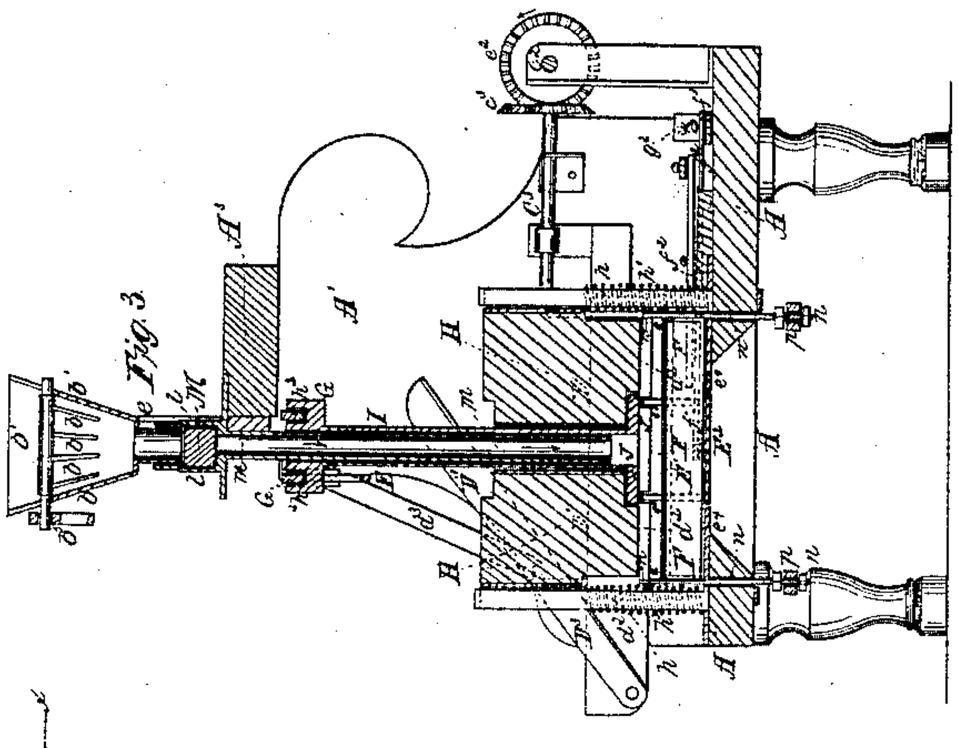

Fig. 3.

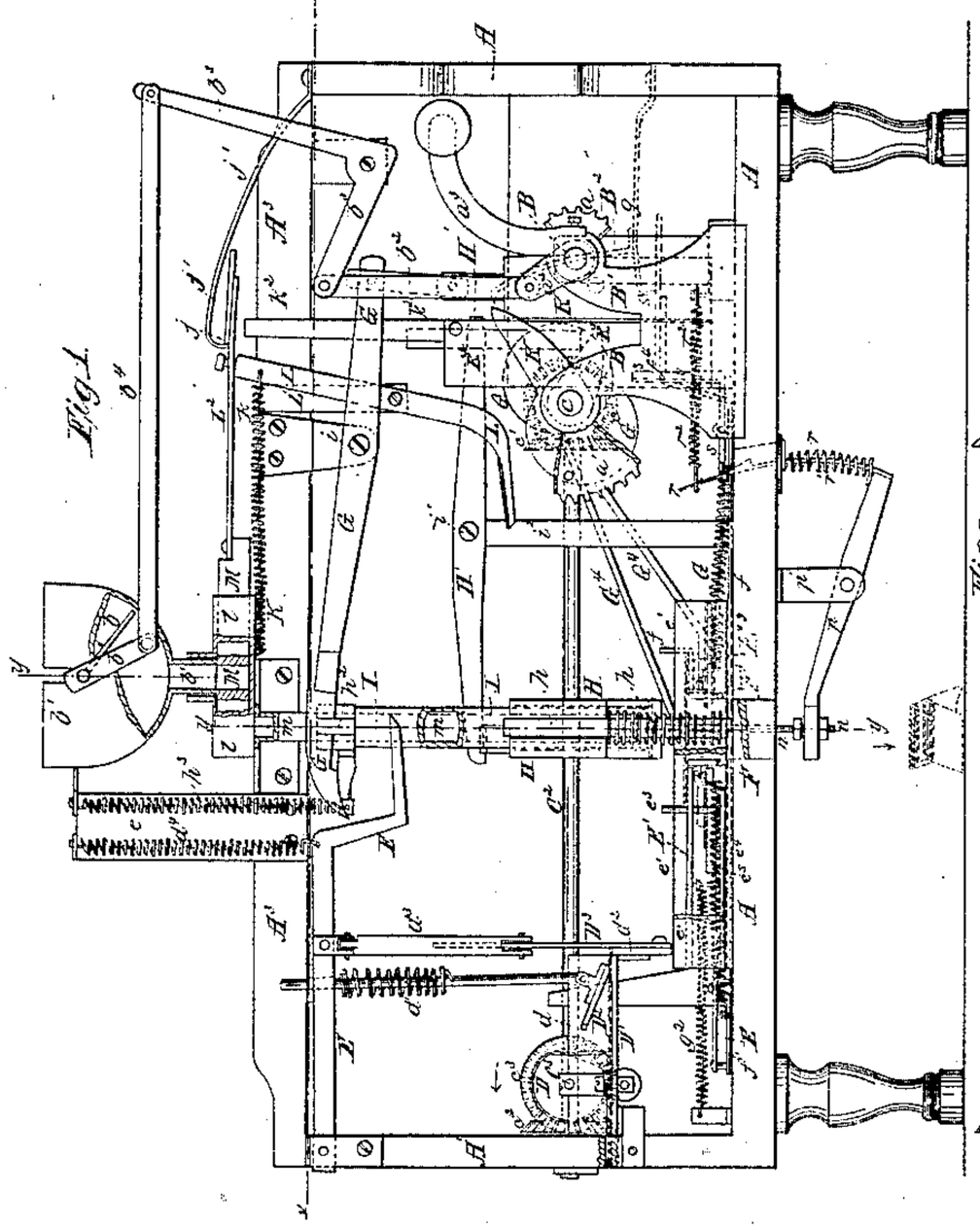

Fig. 1.

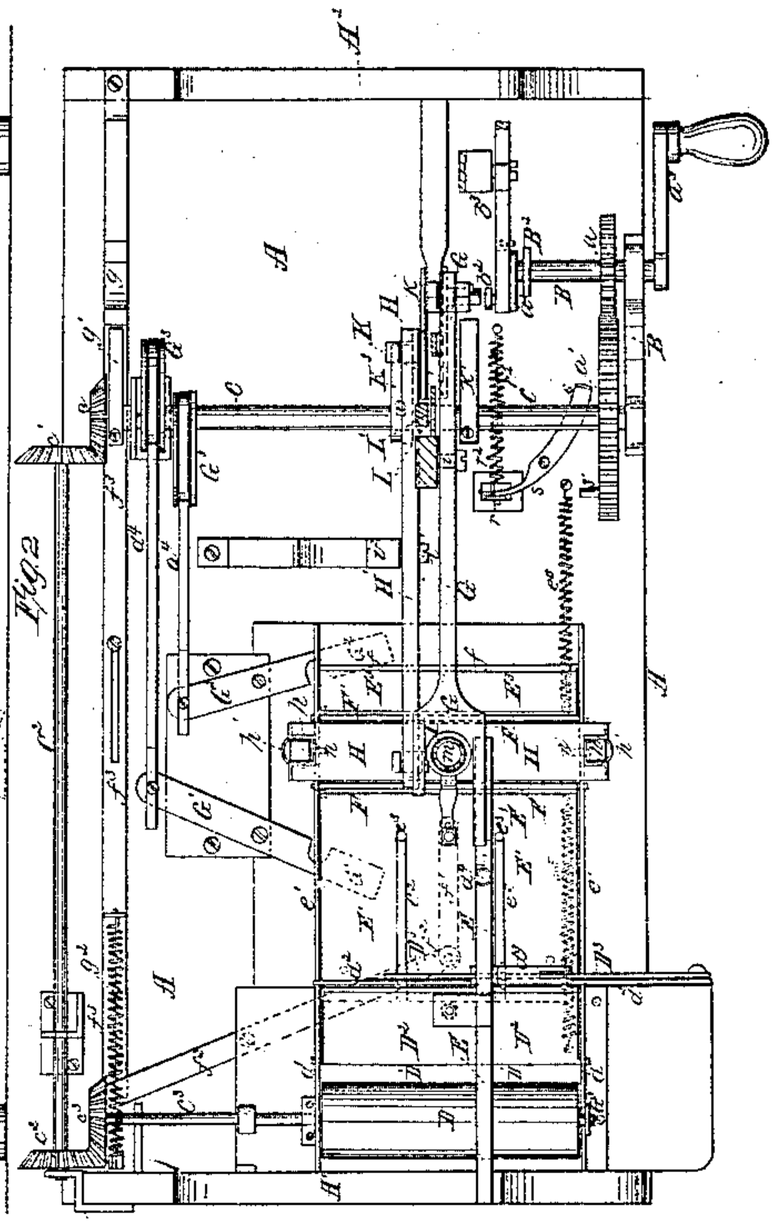

Fig. 2.

Witnesses.
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U. S. PATENT OFFICE.

No. 1,638. 1861. WHOLE No. 32,642.

Machine for Filling and Folding Medical Powder Papers.

MARK S. PALMER, OF NEW BEDFORD, MASS.

Letters Patent No. 1,638, *dated June* 25, 1861.

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

Be it known, that I, M. S. PALMER, of New Bedford, in the county of Bristol and State of Massachusetts, have invented certain new and useful improvements in Machinery for Filling and Folding Medical Powder Papers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a side elevation of one side of the improved machine, several of the parts of which are represented as being broken away to exhibit some of the parts behind them. This figure represents the several movable parts of the machine in their proper relative position, when the strip of paper is ready to receive the powder.

Figure 2 is a plan view of the machine, represented in a section taken in the horizontal plane indicated by the red line *x x*, figure 1.

Figure 3 is a transverse section, taken in the vertical plane indicated by the course of red line *y y* in figure 1.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements in machinery for preparing strips of paper, filling them with certain quantities of powder, and for folding the powder up in the papers in a proper manner and shape for medical purposes. The invention is intended more especially for folding papers containing homœopathic powders, and for folding and filling papers with Seidlitz powders; but it will be hereinafter shown that, by varying the size of the parts which receive the

papers and fold them, the machine may be adapted for folding large or small papers of powder.

The nature of my invention consists:

Firstly, in the combination of a horizontal transverse feed-roller, rotating on a bed plate, a pressure plate, acting upon a bed plate, a shear-cutting knife, and a reciprocating finger-carrying plate, all arranged in such a relation to a folding box, and operating in such a manner, as will be hereinafter described, that slips of paper of the proper width will be fed under the knife, cut off the proper length and width, and carried into the folding box to receive the powder, and to be folded up.

Secondly, in constructing the folding box with jointed sides, operated upon by certain levers and springs, as will be hereinafter described, in combination with a sliding plate in the bottom of said box, arranged and operating in the manner hereinafter described.

Thirdly, in the employment of a pressing or creasing block, operating in vertical guides, and acted upon by levers and springs, which give to it an alternate vertical movement, as will be hereinafter described; said block being so arranged with relation to the folding box that it presses and creases the strip of paper down evenly into this box, and leaves the paper in a proper condition to receive its side folds from the side plates of the folding box, as will be hereinafter described; and, in conjunction with this pressing head, two spring-fingers are so arranged at each end of the folding box, and acted upon by said head, that they hold the strip of paper down in the bottom of the folding box, after the creasing head leaves it, until the side plates of this box commence to fold the paper, as will be hereinafter described.

Fourthly, in combining a plunger, having a central hollow shaft, with the aforesaid creasing head, the same being arranged and operating, as will be hereinafter described, for pushing the paper, after it has been filled and its sides folded, through the bottom of the folding box, thereby crimping the ends of the paper and discharging it from the machine.

Fifthly, in arranging, above the creasing head and its plunger, a hopper for containing powder, and in arranging under this hopper a reciprocating measuring box, which receives its charge of powder from the hopper, and discharges the measured quantity through a vertical tube, communicating with the hollow shaft of the plunger, into the paper which is in the folding box ready to receive it; all as will be hereinafter fully explained.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is a table, and A^1 A^2 are two end pieces which project up perpendicularly from the ends of table A a suitable distance, and are connected at their top ends by a horizontal cross-bar A^3. This forms the frame for containing and supporting the several parts of the machine.

Palmer's Improved Machine for Filling and Folding Medical Powder Papers.

B is a short crank shaft, which has its bearings in one arm of the double bearing block B^1 and in a perpendicular portion B^2. This crank shaft is arranged near one end of the table A, and it gives rotary motion to a horizontal transverse shaft C, through the medium of pinion spur wheel a and large spur wheel a^1, represented in figure 2 of the drawings. Shaft B carries, on one end, a short crank arm a^2, and on the opposite end a hand crank a^3. The crank a^2 gives a vibrating motion to its stirrers b, shown in figure 3, which are arranged within a hopper b^1, through the medium of a rod b^2, a pivoted angular lever b^3, a horizontal connecting rod b^4, and a short rod b^5, which is connected to the transverse rocking bar to which the stirrers b are secured.

On the opposite end of shaft C, to the spur wheel a^1 is keyed a bevel spur wheel c, the teeth of which engage with a corresponding bevel spur wheel c^1 keyed to the end of a horizontal shaft C^2, which is at right angles to shaft C. This shaft C^2 extends in a longitudinal direction to the opposite (front) end of the table A, and gives rotary motion to a horizontal transverse feed-roller shaft C^3, through the twin bevel spur wheels c^2 c^3, figures 1, 2 and 3. This roller shaft C^3 carries a feed-roller D, which has an irregularly curved surface, for the purpose of operating alternately upon the slip of paper represented in red lines, figure 1, which passes over the horizontal shaft or bed plate D^1. The feed-roller D is in length equal to the width of the slip of paper from which the powder papers are cut, and at each end of this feed-roller D is a longitudinal guide plate d, which extends from the inside of the perpendicular end piece A^1 to the edge of the bed plate D^1. These two guide plates d d serve to guide the slip of paper up straight to the knife. The paper, in passing over bed plate D^1 to be cut, passes under a spring pressure plate D^2, the edge of which is pressed down by a spring d^1 on the paper near the edge of bed plate D^1 and close to the cutting edge of the fixed plate d^2, which extends along the edge of the plate D^1. The knife D^3 is pivoted, at 1, to the end of plate d^2, and the cutting edge of this knife D^3 works against the cutting edge of plate d^2 and cuts the slip of paper off in proper lengths. Knife D^3 is operated by a jointed rod d^3, which connects with vibrating arm E; arm E is pivoted at one end, at a point near the top of end piece A^1, and this arm E extends along in a longitudinal direction a suitable distance, and has its end bent so as to form two right angles, as represented in figures 1 and 2 of the drawings. d^4 is a helical spring, which is connected to the arm E and to a perpendicular standard e, figure 1. This spring d^4 keeps the bent end of arm E suspended in the position represented in figure 1 until it is acted upon by the downward motion of the long arm of great lever G, hereinafter explained.

E^1 is a horizontal plate, the plane of which is some distance below the plane of bed plate D^1; on each side of this plate E^1, which is about as wide as the bed plate D^1, is a longitudinal ledge or projecting guide plate e^1 for keeping the strips of paper straight. These two side or guide plates e^1 e^1 extend along par-

allel to each other, past the folding box, and are thus made to serve as ends for this folding box. The plate E^1 has two longitudinal slots e^2 e^2 through it, as shown in figure 2, through which slots play two vertical pins e^3 e^3, which project up from a reciprocating plate E^2, shown infigure 3. Plate E^2 is in a horizontal plane and works between the guide plates e^4 e^4 on the surface of the table A. The plate E^2 is the width of the length of the papers when folded, and the guide plates e^4 e^4 on each side of this plate E^2 are each equal in width to the length of the folded ends of the papers. The plates e^4 e^4 extend through the folding box and form a portion of the bottom of this box and leave a space in the middle of the box equal in width to the plate E^2, through which space the paper is thrust in the act of receiving its end folds, as will be hereinafter described.

At the end of plate E^1 is a plate F, the edge of which is level with the surface of plate E. The plate F forms one side of the folding box, and its height is equal to about one-half the width of the folding box. This plate F is pivoted at its lower corners to the bottom of the guard plates e^1 e^1, and the coiled spring e^5 keeps the top part of plate F up against the edges of plate E. Opposite to plate F is another pivoted plate F^1, corresponding in length and height to plate F, which completes the four sides of the folding box. Plate F^1 is acted upon by a coiled spring e^6, which keeps the upper edge of this plate up against a shelf E^3, which shelf is in the same horizontal plane as slotted plate E^1; and at the back of this shelf projects up a ledge *f*, against which one edge of the strip of paper abuts, when it is in a proper position to be acted upon by a creasing head H, hereinafter explained.

The plate E^2 receives an end play, by the following arrangement: f^1 is a rod jointed to plate E^2 and to the end of a vibrating lever f^2, which receives its vibration from a long longitudinal rod f^3, to which this lever f^2 is pivoted; f^3 extends back behind the shaft C, and this rear end has a notch f^4 on it, shown in dotted lines, figure 1, into which the end of a spring tripping plate *g* catches when the rod f^3 is moved back. This rod f^3 is bent up, as represented in figure 1, in such a manner that the end of tripping plate *g* will always rest on its extreme end, and that the toe g^1, on shaft C, will move this rod f^3 back under the tripping plate *g*, to be caught by this plate at each revolution of said toe. The toe g^1 also strikes an arm which projects up from, and forms a part of, this tripping plate g^1 and releases the rod f^3 from the tripping plate, when a coiled spring g^2 moves the rod *f* forward and throws the plate E^2 under the pressing block H. In this manner, at every revolution of the toe g^1 the plate E is moved from under the pressing block H and again returned. This alternate reciprocating motion of plate E^2 causes the pins e^3 e^3, projecting from this plate through the slots e^2 e^2, in plate E^1, to move a strip of paper up under the pressing block H, in a proper position to be operated upon by the creasing block H.

G^1 G^2 are two vibrating levers, operated by the eccentrics G^3 G^3, which are

keyed to the shaft C, through the medium of connecting rods G^4 G^4. These levers operate alternately upon their respective plates F F^1, at proper times, and shut these plates down on the bottom of the folding box; then, as the levers release the plates, the springs e^5 and e^6 return the plates to their original positions.

At the ends of the folding box herein above described, and on the outside of the plates e^1 e^1, are two perpendicular guides *h h*, between which work the creasing block H. This creasing block H rests on springs h^1 h^1, which are coiled around the guides *h h*, and these springs force the block H up, when it is released from the lever H^1, to allow a strip of paper to be put over the folding box.

The width and length of block H is such that it will fit snugly into the folding box when pressed into it.

Through the middle of the length of the head H is a vertical hole, and through this hole passes a tube I, which has fixed to its lower end a plunger J, which is equal in its length to the width of plate E^2, and in its width to that of the folding box. This plunger J will thus pass through the central portion, which is in the bottom of the folding box.

A recess is made in the bottom of the head H, to receive the plunger plate J, and, when the plunger is fully drawn up into this recess in the creasing head H, its bottom surface is level with the bottom of the creasing head. The tube I has two lugs h^2 h^2 projecting out from each side and near its upper end, and on these lugs rest the bifurcated end of the lever G. Tube I has also a short arm projecting from its upper end, to the end of which a coiled spring h^3 is attached; this spring is attached, at its upper end, to the top of standard *e*, and it thus operates upon the tube to keep the lugs h^2 h^2 up against the end of lever G. This spring h^3 gives the upward motion to the plunger J, and holds this plunger up against the bottom of the block H, when this block is in operation. The lever G is pivoted at *i* to a block which hangs down from the bar A^3, and the rear end of this lever G is connected to a plate K, which receives a vertical motion from a toe or cam K^1, which is keyed to the shaft C and lifts the plate K at each revolution. The spring h^3 throws the plate K down again, after the toe K^1 releases it. The lever H^1, which has its fulcrum at i^1 in a standard i^2, which projects from table A, is acted upon by a vertical plate K^2, which receives an upward motion from a toe K^3 on shaft C. The upward motion of plate K^2 moves the pressing head down into the folding box, and when the toe K^3 releases the plate K^2 the springs h^1 h^1, together with spring h^3, elevate the pressing head H and plunger J again. In the revolution of toe K^3, it operates upon the lower curved end of a perpendicular lever L, pivoted to a hanger L^1, which projects down from bar A^3. This lever L has a horizontal rod L^2 pivoted to its upper end, which rod passes in a longitudinal direction to a sliding block M, shown in figures 1 and 3, and is pivoted to the end of this block M. The rear end of rod L^2 has a notch *j* formed on it, so that this rod will be caught and held by the spring catch plate

j^1, figure 1, when rod L^2 is forced back. A coiled spring k is applied to the upper arm of lever L, which moves the lever and the rod L^2 forward, when this rod is released from catch j^1. The toe K^3 moves the rod L^2 back until it is caught and held by the spring catch j^1; then, when this toe K^3 lifts the plate K^2, a vertical tripping rod k^2, which projects up from K^2, lifts the catch plate j^1 and allows spring k to move the rod L^2 forward, thus giving an alternate reciprocating motion to the rod L^2, and consequently to the block M, which is attached to this rod. The block M moves back and forth longitudinally within a square case l, with which case the hopper b^1 and the tube m communicate. The block M has a hole through it, the capacity of which may be graduated in any suitable manner; this hole through the block M is brought alternately under the hopper tube b^1 and over the tube m, by the means herein above described. The vertical tube m passes down a suitable distance into tube I, and serves as a guide for this tube I in its vertical movement.

At the ends of the folding box, and suitably let into the side plates e^1 e^1, are two vertical rods n n, the upper ends of which are turned over at right angles, as represented in figure 3, so as to form fingers. The lower ends of rods n n are connected to the front ends of rocking levers p p, which are arranged under the table A and have their fulcra in hangers p^1 p^1. From the rear ends of levers p p projects up a curved latch plate r, which passes up through a hole in table A. A spring r^1 is coiled around the latch plate r under the table A, which spring bears against the under side of the table A, and also against the rear arms of levers p p. A coiled spring r^2 is connected to the top end of latch r above the table; this spring is used for the purpose of holding the catch or hook on plate r in its place, when the rear ends of levers p p are forced up. The latch plate r is further acted upon by a short lever s, which is struck by a pin s^1 on the side of spur wheel a^1, so as to release the latch r and allow spring r^1 to force the rear ends of levers p p down, and the rods n n upward, in the positions represented in figures 1, 2, and 3, of the drawings. The upper ends or fingers of rods n n are moved down on the bed of the folding box by the creasing block H, when this block is depressed.

The lever E is acted upon with a downward pressure by the end of lever G, and this downward motion of lever E forces the knife D^3 down and cuts off a strip of paper. The lever E and knife D^3 are raised again by spring d^4, when the lever G is raised.

The operation of the entire machine is as follows:

Motion is given to the main driving shaft B by turning the crank in the direction indicated by the arrow in figure 1, and this shaft transmits an opposite rotary motion to shaft C through spur wheels a a^1. Shaft C gives a rotary motion to shaft C^2, and this latter shaft gives a rotary motion to shaft C^3 and turns the feed-roller in the direction indicated by the arrows in figures 1 and 2.

The end of a roll of paper, of the proper width to pass between the guide or

guard plates *d d*, is passed through a slot in the end piece A, as represented in figure 1, until it is received by the feed-roller D. This feed-roller now moves the paper along the bed plate D^1, under the spring pressure plate D^2, and towards the knife D^3. When a proper length of paper has passed under the feed-roller D, this feed-roller ceases to operate upon the paper. The knife D^3 is now depressed and a proper length of paper is cut off from the end of the roll, falls down on the plate E, and is moved quickly over the folding box by the pins e^3 e^3, as represented in figure 1. The creasing block H now descends and creases this piece of paper which lies under it, preparatory to the folding operation. This pressing or creasing block H, in its descending movement, presses down the rods *n n*, and causes the paper to be held down by the fingers on these rods. At this point in the operation the block M discharges a quantity of powder through tube *m* and tube I into the creased paper. The creasing block H is now thrown up, and the side plate F folds one side of the creased paper over the powder and instantly returns back to its former position; then the opposite folding plate F^1 operates and folds the opposite side of the creased paper over the first folded side; this plate F^1 again recedes and leaves the powder folded within the paper in the folding box. At the instant the first folding plate F starts to perform its work the pin s^1 strikes lever *s*, disengages the latch plate *r*, and allows spring r^1 to force the rods *n n* up so as to raise the paper from the fingers on these rods *n n*.

The toe j^1 on shaft C now moves the rod f^3 back, which causes the plate E^2 to recede from the folding box and leave the space, herein referred to, in the bottom of this box open; rod f^3 is caught by the hook or spring plate *g*, which keeps the plate E^2 in the position just described. The lever G is now brought into action, and the plunger J is caused to descend and force the paper with the powder in it down through the quadrangular space in the bottom of the folding box, and crease the ends of the paper against the edges of the plates e^4 e^4, so that these ends may be readily folded over by hand in packing the powders up into boxes.

When the lever G causes the plunger J to descend, it also forces the knife D^3 down and cuts off another powder paper, which has been fed up to the knife to the roller D, and this piece of paper falls down, as did the first one, on the plate E^1 and before the pins e^2 e^2. The plunger J now ascends again and the plate E^2 is allowed to fly back again, filling up the space in the bottom of the folding box, and carrying a piece of paper over the folding box to be acted upon by the creasing or pressing block H, as above described.

During these operations the stirrers *b*, in hopper box b^1, are vibrated, and this agitates the powder in the hopper and causes the powder to be discharged regularly into the hole through the reciprocating block M; then this hole is brought under the hole in the bottom of the hopper. This block M receives an alternate reciprocating motion from the crank arm a^2 of the main shaft B, through the medium of levers and connecting rods hereinbefore described, and this alternate motion of block M is in harmony with the feeding and folding of the paper, so

that the powder will be dropped in the centre of the paper, while the creasing or pressing head H is in a depressed condition.

The ends or fingers of vertical rods *n n* are intended to hold the paper after it has been creased in the folding box, to allow the creasing head to ascend without drawing it out of the box. These rods *n n* are thrown up immediately preceding the operation of the folding plates F F, as before described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1st. The feed-roller D, bed plate E^1, spring pressure plate D^2, and knife D^3, in combination with the reciprocating fingers or pins e^2 e^2, working in slots through the lower plate E, all arranged with relation to the folding box and operating substantially as herein described.

2nd. The folding box, constructed with jointed folding sides F F^1, operating as described, in combination with the reciprocating bottom plate E^2, and its side bottom plates e^4 e^4, as set forth.

3rd. The pressing or creasing block H, operating between suitable guides *h h*, when said block is arranged in the relation to the folding box, and operates as described, to crease the paper preparatory to the folding operation; and, in combination with creasing head, I claim the holding fingers *n n*, or their equivalents, operating substantially as and for the purposes herein set forth.

4th. I claim, in connection with creasing head H, the plunger J; and in combination with this plunger I claim the hollow stem or tube I, tube *m*, case *l*, reciprocating measuring block M, and hopper b^1, all arranged and operating conjointly, substantially as herein described.

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Witnesses:

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