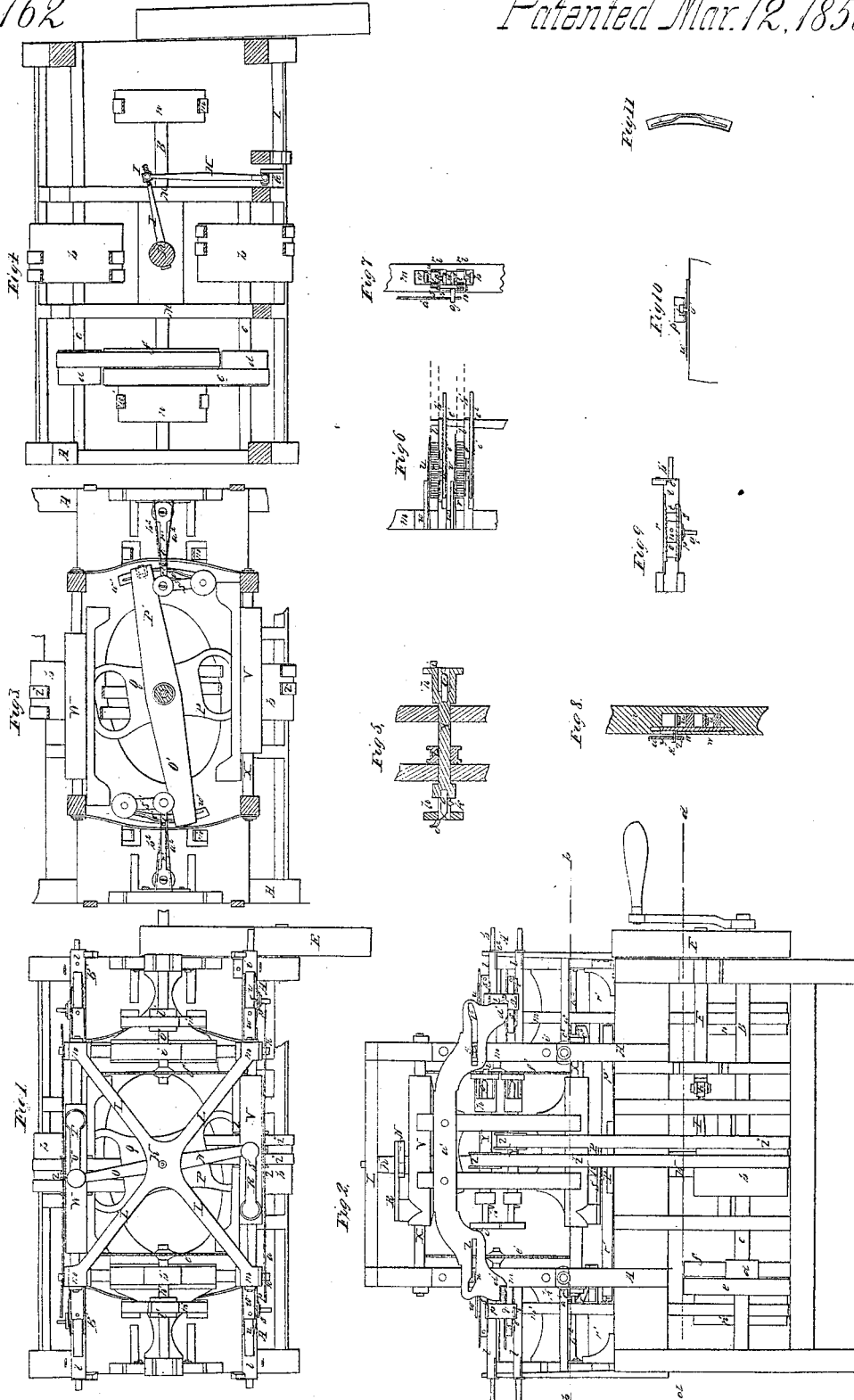


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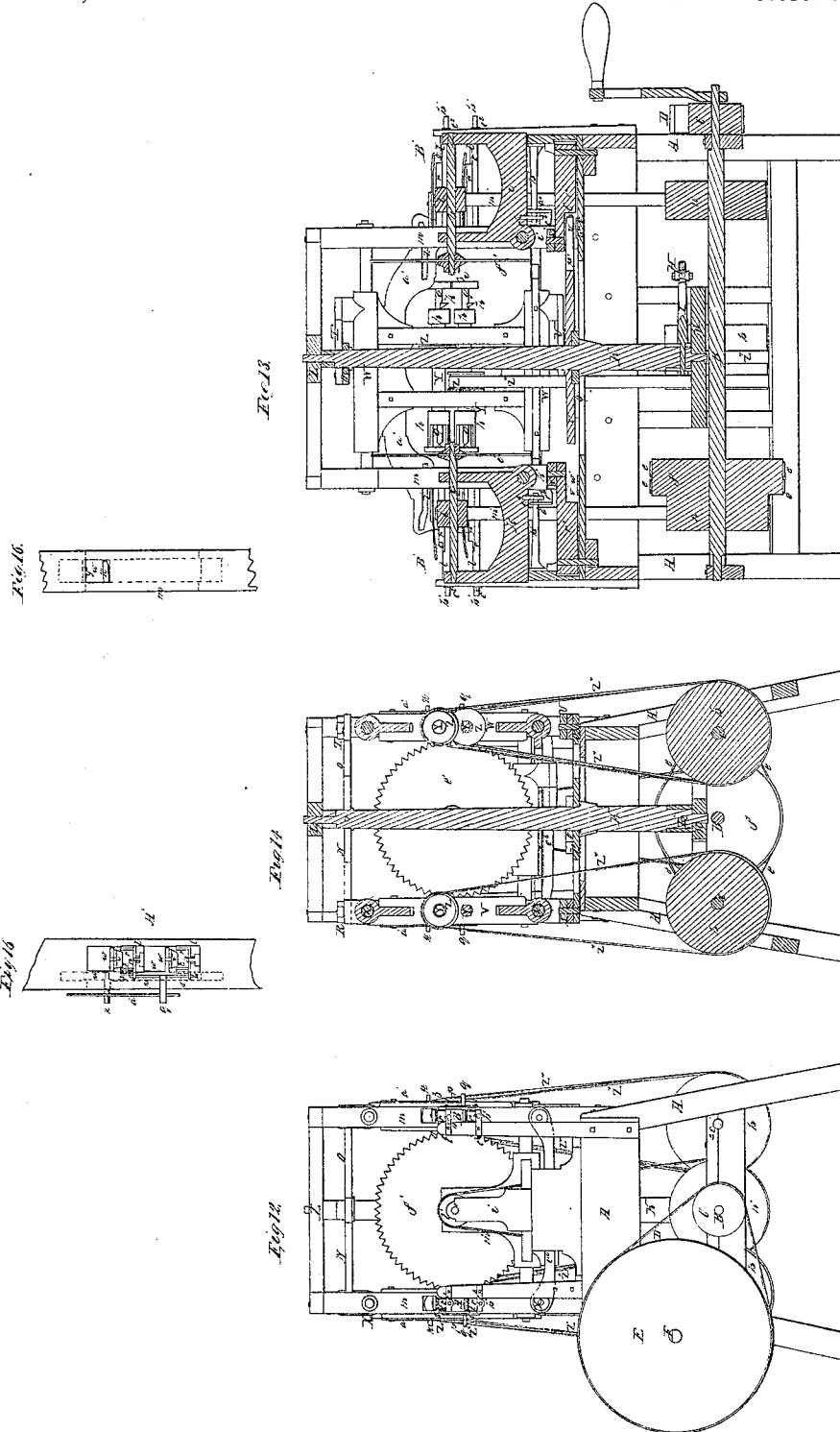


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UNITED STATES PATENT OFFICE.

ASA FESSENDEN, OF TEMPLETON, MASSACHUSETTS.

MACHINERY FOR MAKING PILL-BOXES.

Specification of Letters Patent No. 7,162, dated March 12, 1850.

To all whom it may concern:

Be it known that I, ASA FESSENDEN, of Baldwinville, in the town of Templeton, in the county of Worcester and State of Massachusetts, have invented a certain new and useful improvement in machinery for turning or manufacturing pill or match boxes and various other articles of like character to which my invention may be applicable; and I do hereby declare that the nature of my invention and the manner in which it operates are fully set forth and described in the following specification and accompanying drawings, letters, figures, and references thereof.

Of the said drawings Figure 1 represents a top, or plan view of my improved machine. Fig. 2 is a side elevation. Fig. 3 is a horizontal section, taken nearly on the plane of the lower or undersides, of the circular saw puppets, or supporting frames or on the line *a b* Fig. 2. Fig. 4 is another horizontal section taken below that last named and on the line *c d* Fig. 2 just above the pulleys of the main driving shaft. Fig. 12 is an elevation of the end at which the crank is situated. Fig. 13 is a longitudinal vertical, and central section. Fig. 14 is a transverse vertical and central section. Fig. 15 is the same as Fig. 7, but on an enlarged scale. Such other figures as may be necessary to a full and clear delineation, and description of the mechanism will be hereinafter specified and explained.

In the several drawings, *t*, represents the framework which is to be made generally as represented in them, and to be adapted to sustain the operative parts of the mechanism attached to it. *B*, is the main or driving shaft, running and supported horizontally, through the lower part of the framework. A small driving pulley *C*, is placed upon the main shaft. Around this pulley a belt *D*, passes, and also over and around, and imparts motion to a large pulley *E* fixed upon one end of another horizontal shaft *F*, arranged upon the outside of the framework as seen in the drawings. A crank *G* is placed upon the opposite end of the shaft *E*, and is jointed to a connecting rod *H*, which extends inward toward the center of the framework, and is jointed to the outer

end of an arm *I*, which projects horizontally and at right angles from a vertical shaft *K*, arranged in the central part of the machine, or framework, and sustained at its ends or journals, in bearings applied to transverse frames *L*, *M*. As the outer extremity of the arm *I* is alternately moved first in one direction and next in the opposite, by the revolutions of the crank *G*, operating through the connecting rod *H*, the vertical shaft *K* is also alternately moved on its bearings a short distance first in one direction and next in an opposite one.

The shaft *K* has four arms *N*, *O*, *P*, *Q*, extending from it in the positions with respect to it, and each other as seen in the drawings, the outer end of each arm having one of four horizontal connecting links or rods *R*, *S*, *T*, *U*, the links *R*, *S*, projecting from the arms in opposite directions to the others *T*, *U*. The two links *R*, *S*, are jointed at their other ends to the vertical cutter carriage *V*, supported so as to move laterally, first in one direction and then in an opposite one, upon the horizontal rods *X*, *X*. The other links *T*, *U*, are similarly connected to another cutter carriage *W*, sustained upon rods so as to move like the carriage *V*, but always in a direction opposite to that in which the carriage *V*, may be impelled. Each of the said cutter carriages has one or more arbors or mandrels *Y*, *Y*, arranged as seen in the drawings. Each of the said mandrels has a small pulley *z*, fixed upon it, at or near its middle, around and over which (pulley) an endless band *z'*, extends, and thence is carried downward, under, and partially around; and in close contact with a drum pulley *b*, situated upon a horizontal shaft *c*, which is driven by means of a small pulley *d*, upon it, a band or belt *e*, and a drum pulley *f*, arranged and fixed upon the main driving shaft as seen in the drawings. At each extremity of each mandrel or arbor *Y*, an apparatus for turning or forming a box, or its cover is fixed, the said apparatus consisting in part of a boring tool or auger, *g*, (see Fig. 5, which denotes a central and longitudinal section of one of the shafts or arbors *Y*, and its turning apparatus) extending from the end of the arbor, and in line with its axis, and also

of a hollow or cylindric, or other proper shaped frame *h*, attached to the arbor, and surrounding the boring tool or auger, and not only carrying the cutting tool *i*, by which the exterior surface of the cylindric box, or its cover is turned, but another cutting tool *k*, by which the rebate, or part of the box upon which the cover is placed is made.

10 In line with the axis of the mandrel produced, and connected with each turning apparatus of the mandrel, one of a series of feeding apparatuses is arranged as seen at *A'*, *A'*, &c., in Fig. 2, and at *A'*, *A'*, *B'*, *B'*, in Fig. 1, each of the said cutting apparatuses for the purpose of feeding up the stick of wood from which the boxes are to be cut as fast as such may be necessary. The sticks, or strips of wood to be reduced to boxes, are to be sawed out square in cross section, and to rest and move upon one of a series of fixed or stationary horizontal shelves *l*, *l*, &c., disposed as seen in Figs. 1 and 2. Fig. 6 is a longitudinal and central section of two adjacent feeding apparatuses. Fig. 7, is a transverse section of the same, and Fig. 8, is a transverse and vertical section of part of one of the four posts *m*, extending upward from or making part of the frame *A*, as seen in the drawings.

Each shelf *l*, has a small metallic plate *n*, placed upon it and in a depression *o*, of it, in depth equal to the depth of the plate, and in length sufficient to admit of the back and forth movement of the plate, as will be hereinafter described. The two plates of the two adjacent shelves *l*, *l*, are connected together by a vertical piece of metal *p* (as seen in Figs. 1 and 7, from the central part of whose exterior side a stud *q*, projects as denoted in Figs. 2, 7, and 9, of the drawings. Each of the plates *n*, has a fixed bar *r*, of metal applied vertically to its inner edge, and a bow spring *s*, similarly fixed upon, and extending above its outer edge.

The outer end of the bow spring has one end of a bar *t*, similar to the bar *r*, attached to it, each of the bars *r*, and *t*, having teeth formed upon their inner adjacent surfaces, in the manner as seen in Fig. 9, which is a horizontal section of them. Two spring bars *u*, *v*, having teeth upon the under surfaces of their rear or outer ends, are arranged with respect to the shelves *l*, *l*, and bars *r*, *t*, as seen in the drawings, and are connected at their inner ends to a vertical slide or frame of metal *w*, see Fig. 8, from whose front side a stud *x*, projects, and through a slot or mortise *y*, formed in the post *m*, (as seen in Fig. 16, which represents a front view of the part of the post in which the mortise is made) and also a curved slot *z*⁵, of a plate *a'*, screwed to the cutter carriage in the position as seen in Fig. 2, the said plate *a'*, being

shaped and applied to the feeding apparatuses as therein presented. Another similar plate and feeding apparatus are applied to the other cutter carriage.

Each of the plates *n*, has a rod *b'*, fastened to and underneath it, and extending outward from it as seen in Fig. 6. Around this rod, a spring *c'*, is wound or passed, one end of which bears against the plate, or a projection therefrom, and the other against a plate *c*², screwed against the shelf.

Whenever the cutter carriage is moved toward the feeding apparatus, the two spring bars *u*, *v*, will be depressed or forced down upon the strips of wood beneath them, and will so remain while the straight or horizontal part of the groove or slot *z*⁵, of the plate *a'*, passes over the stud *x*. As the carriage continues to advance the end of the plate *a'*, or a projection *d'*, shaped properly for each carriage, will come into contact with the stud *q*, projecting from the piece of metal *p*, and will force said piece of metal, and the toothed bars connected with it, backward, or in the direction in which the plate *a'*, is moving, and thus cause the toothed bars *r*, *t*, to slip or slide over the sides of the strips of wood, in the shelves adjacent to them.

When the motion of the cutter carriage is reversed, the spring bars *u*, *v*, are elevated from the strip, so as to permit the springs *c'*, *c'* to throw the toothed bars *r*, *t*, and the strips of wood forward toward the cutters.

Every time either of the cutter carriages approaches toward either of the feeding apparatuses, the cutting apparatus of such feeding apparatus, cuts a box or box lid, upon the stick or piece of wood, which on being formed is separated from the stick by one of two circular saws *e'*, *f'*, each being arranged between and at right angles to the cutter carriages, as seen in Fig. 1, and applied to the inner extremity of one of two horizontal mandrels or shafts *g'*, *h'*, which are respectively supported by and revolve in, two puppet heads, or frames *i'*, *k'*. Each of the said heads or frames *i'*, *k'*, is to be supported upon transverse rails or rods, or other suitable contrivances, which will admit of a reciprocating rectilinear movement of the carriage and its saw, and in directions toward and away from the cutter frames, and to such extent as to carry the saw against and through the sticks on which the boxes are turned. The saw shafts are each revolved by a pulley *l'*, a band *m'*, and a pulley or drum *n'*; the former pulley being arranged upon the saw shaft, and the latter pulley upon the driving shaft. The mechanism by which each of the saws is caused to alternately move in one direction and in the opposite is as follows.

The vertical shaft *K*, has two arms *o'*, *p'*,

(Figs. 2 and 3,) projecting from it, just above and at right angles to the arms P, Q, before described; each of the said arms o' , p' , being made to extend underneath one of the frames i' , k' , and toward a horizontal lever r' , arranged underneath the saw frame, or in the position as seen in the drawings. The inner end of the lever, and the lower part of the saw frame, are connected by a connecting rod s' , see Figs. 3 and 13, properly jointed to each. The lever turns horizontally, or vibrates first in one direction, and next in the opposite, upon a suitable fulcrum at its rear end. The outer end of each of the arms o' , p' , has a small slide t' (see Fig. 10, which denotes a vertical section of the end of one of the arms o' , p' , and the grooved plate beneath it) placed within it, and adapted so as to move back and forth in the end of the arm, in the direction of the length of the arm. The said slide is moved by a stud u' , which projects from its under side, and enters a curved groove v' , formed in a plate w' , arranged horizontally beneath it, Fig. 11, exhibiting a top view of the plate and groove.

When the stud u' , passes into the eccentric portion x' , of the groove, the slide t' , in the end of the arm, will be forced outward and against the side of the lever r' , and as the arm continues to move it will move the lever, and thus cause the saw and its frame to slide or move toward one of the cutter carriages. While the stud is moving in the short straight portion y' , the saw is performing its office of cutting off the turned box. And when the stud passes entirely through the part z' , of the groove, the slide is drawn into the arm so as to permit one of the springs a^2 , b^2 , by its recoil, to throw the saw and its frame toward the center of the machine. The two springs a^2 , b^2 beneath each saw carriage or frame are disposed as seen in the drawings, and act against a stud c^2 , which projects downward from the underside of the saw frame, and between them, and brings up against a stud a^6 , projecting upward from a stationary metallic cross bar c^6 .

From the above description it will be seen that four or eight sticks of wood may be operated upon, by the two cutter carriages, and their cutters, at one and the same time; the feeding operations taking place at one end of each carriage, while the cutter of the opposite end, and the saw thereof, are performing their respective operations.

The cutter frame h , with its tool i' , may be termed a hollow auger, as it cuts a cylinder upon the end of the stick. The tool q , placed concentrically within the frame h , is a boring tool, and cuts a cylindrical hole within the said cylinder. When the cylinder or stick has advanced a sufficient dis-

tance within the frame or stock h , the cutter h , is brought into action against the wood and as the stick continues to enter, it (the said cutter h ,) turns down upon the cylinder, so as to form the part of the box over and on which the cover is to be placed. In turning the cover of a box the tool h , is not used. In other respects the cover is made in the same manner as the body of the box, except that it is generally made much shorter. In the operation of the machine a box body is first made on the stick adjacent to one end of one of the mandrels. This being effected, the machinery so acts as to move the cutters in action, out of action, and at the same time carry those at the opposite end of the mandrel into action against a stick from the feeding apparatus belonging to such end; the stick of such feeding apparatus having in the mean time been advanced the proper distance toward its cutters. From the above it may be said, that while one set of cutters at one extremity of the mandrel is in the act of leaving their work, those at the other end are in action and performing their office of reducing a stick. Consequently the operation of the machine may be said to go on without cessation.

By means of the carriage W, and its mandrels, cutters, and feeding apparatuses, combined with the carriage V, and its operating mechanism, double the amount of work can be done in the same or about the same time, that can be effected by the use of but one carriage, having the same number of mandrels. The automatic combinations above described, enable a person, to manufacture either match or pill boxes, with great rapidity, and perfection.

Having invented an automatic, or self directing machine of great value in the manufacture of boxes, and having hereinbefore described the same, what therefore I claim as my invention, is as follows.

I lay no claim to the particular tools or reducing cutters used in cutting the wood of a stick, but

What I do claim is—

1. The above described peculiar arrangement of two or more sets of reducing cutters, applied to one carriage V as above set forth, two or more sets of reducing cutters, applied to another carriage W in a similar manner, feeding apparatus, applied as above set forth, to each cutting apparatus, and two circular saws playing between and acting in concert with the adjacent opposite cutting apparatus of both carriages V, W; the whole operating together substantially as above specified.

2. I also claim the combination of machinery, by which each of the circular saws, or their puppet heads, or carriages, are al-

ternately moved, first in one direction, and
next in the opposite direction, and on their
supporting ways; the said machinery con-
sisting of the arm o' , or p' , affixed to the
5 upright shaft K, the slide t' , and its project-
ing pin applied to end of the said arm, the
grooved cam plate w' , the lever or arm r' ,
connecting rod s' , the pin c^2 , projecting from
the underside of the carriage, and the
10 springs a^2 , b^2 , the whole being constructed

and made to operate, substantially in the
manner, and for the purpose, as hereinbe-
fore specified.

In testimony whereof I have hereto set
my signature.

ASA FESSENDEN.

Witnesses:

HENRY NEWTON,
CLARISSA NEWTON.