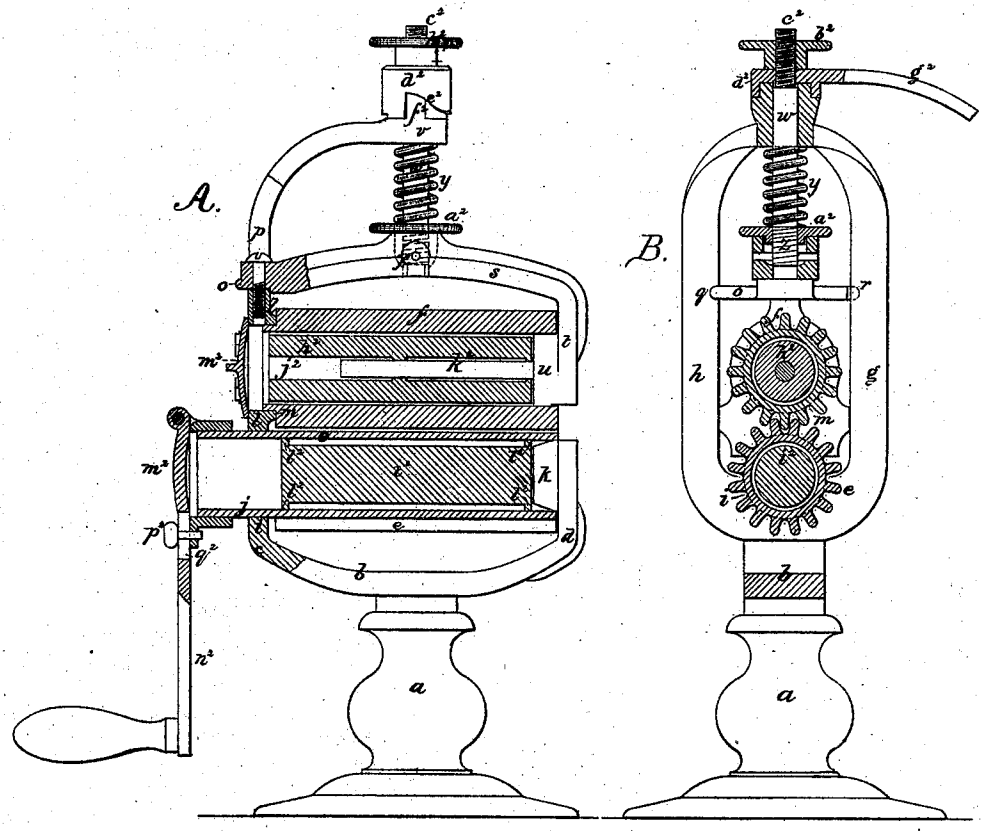
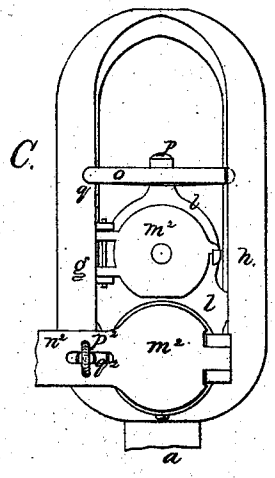
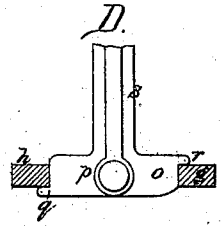
J. Leavitt & E. L. Howard,

Fluting Machine.

No. 100,645. Patented Mar. 8. 1870.







Witnesses.
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United States Patent Office.

THOMAS LEAVITT AND E. L. HOWARD, OF MALDEN, MASSACHUSETTS.

Letters Patent No. 100,645, *dated March* 8, 1870.

IMPROVEMENT IN FLUTING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that we, THOMAS LEAVITT and E. L. HOWARD, both of Malden, in the county of Middlesex, and State of Massachusetts, have invented an Improved Crimping or Fluting-Machine; and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

The invention relates to details of construction of rotary fluting or crimping-machines in which fluted or corrugated rolls meshing together are used, the rolls being hollow and being heated by suitable cylindrical hot irons placed within then.

The improvements have reference to the provisions for hanging and adjusting the rolls and for supporting the irons within them, and also to the method of hanging the doors or gates which close the rolls when the irons are within them.

The drawings represent a crimping or fluting-machine embodying our improvements.

A shows the machine partly in side elevation and partly in sectional elevation.

B is a vertical cross-section of the rolls.

C is an end view of the roller-frame, showing the doors that shut the irons within the rolls.

D is a sectional plan, showing the detail of construction by which the upper roll-carrier is entered, supported, and guided in the bars of the frame.

a denotes a central pillar or standard, supporting upon its top a longitudinal bar or bed-plate, *b*, at the opposite ends of which are two standards, *c d*, that immediately support the lower crimping-roll *e*.

(This roll *e* and its fellow-roll *f* are fluted or corrugated, as are other rolls in such machines, and in crimping fabrics they operate, so far as the flutes are concerned, precisely like other crimping or fluting-machines.)

The standard *c* forks into two uprights, *g h*, at the foot of which they unite and form a half bearing, *i*, upon which a cylindrical end, *j*, of the lower roll *e* rests and rotates.

The opposite end of this roll is made open or with a circular opening of the size of the inner or mean diameter of the roll, and by means of this opening such end of the cylinder is journaled and rotates on a journal-pin or stud, *k*, projecting from the top of the standard *d*, as seen at A.

Over the bearing *i*, between the uprights *g h*, is a sliding plate, *l*, in which is a bearing, *m*, for one end of the upper roll *f*, the cylindrical end of the upper roll serving as its journal and resting and rotating in this bearing.

The bearing or plate *l* depends from a slide, *o*, which extends across between the uprights *g h*, as seen at C and D, this bearing being hung to the slide *o* by a screw, *p*, and the slide being kept in position by two lips, *q r*, which project upon opposite sides of the uprights, as seen at D.

The slide *o* is formed on one end of a bar, *s*, extending over the upper roll, a vertical arm, *t*, depending from the opposite end of the bar, and having an inwardly-projecting journal-pin, *u*, which projects into and supports the adjacent end of the upper roll, as seen at A.

The two uprights *g h* extend above the bar *s*, as seen at B, and unite over the center of the bar, forming there a boss, *v*, through which passes a vertical rod, *w*, to the bottom of which is pivoted the bar *s*, as seen at *x*, the pivot-joint allowing the bar *s* (and the upper roll hung thereto) to rock longitudinally, while the lips *q r* prevent any laterally-swiveling movement of the roll.

The rod *w* slides loosely through the boss *v*, but between the bottom of the boss and the bar *s* is a strong spring, *y*, the stress of which keeps the upper roll down in contact with the lower roll, and one end of the lower roll down upon its half bearing *i*.

To variably adjust the pressure of the upper roll, the rod *w* is formed with a screw-thread, *z*, upon which works a nut, a^2, the lower end of the spring resting directly upon the nut, and the stress of the spring being varied by turning the nut up or down, as will be readily understood, the pivotal connection of the bar enabling either end of the roll to yield to irregularities in thickness of the material being crimped.

While provision is thus made for adjustable pressure of the upper roll, the two rolls are adjusted relatively to each other, or the distance of the upper from the under one is adjustably determined, by hanging the rod *w* to the arm or bar *s* by means of a nut, b^2, working on a screw-thread, c^2, at the upper part of the rod, the rod and the roll hung thereto being raised by turning the nut in one direction, and the roll falling by the stress of the spring, when the nut is turned in the opposite direction.

To separate the rolls for the purpose of easily removing them, we employ on the rod *w* a ring or collar, d^2, at the lower edge of which are inclines or cams e^2, which work over projections f^2, extending from the boss *v*.

The nut b^2 rests upon the top of the cam-ring, and the ring is provided with a lever-handle, g^2, by turning which in one direction the cams e^2 slide over the projections f^2, and lift the rod and the upper roll, reverse movement of the lever allowing the spring to press down the rod and roll.

The upper roll is heated by an iron, h^2, and the lower roll by an iron, i^2. In other crimping-machines these irons rest directly upon the inner surfaces of the

rolls, along the whole length of each iron, and as the irons are sometimes very hot when placed in the rolls, the contact causes the roll to become over-heated, so that the fabric to be crimped is burnt. To remedy this, we so construct and dispose the irons that the hot iron does not come in direct contact with the surface of the roll.

For this purpose the iron may be made with a central hole, j^2, running axially through it, the iron by means of this hole being hung upon a long pin, k^2, projecting centrally from the inner face of the journal-pin u, as shown in the upper roll at A, the iron being slightly smaller in diameter than the inner diameter of the roll, and direct contact of the iron with the roll being thus prevented. Or the iron being made slightly smaller in diameter than the roll, as described, may have flanges l^2 at its opposite ends, these flanges presenting insufficient surface to enable the roll to become unduly heated by their contact, and the main surface of the roll being by them kept out of contact with the upper surface of the iron, as shown in the lower roll at A.

The roll itself may be made with inwardly-projecting flanges near its ends, to support the iron out of contact with the main surface of the roll, but the flanges l^2 on the iron are preferable, as the iron is more easily placed in the roll than if the flanges were in the rolls.

To enable the irons to be readily taken from the rolls or replaced therein, there is provided for each roll a hinged door, m^2. The door of the upper roll is hinged like a stove-door, as seen at C, and opens laterally, as will be readily understood.

The door of the lower roll is formed as an integral part of the handle n^2, the handle turning on a hinge, o^2, and the door being confined in a closed position by turning a button, p^2, which projects through a slot, q^2, in the handle, as seen at A and C.

To preserve the heat of the rolls as much as is possible, each journal-pin k u may be made tapering or frusto-conical, as seen at A, so that contact of the cylinder is in effect only in one lateral plane or in a line around each roll, just at or near the end of the roll.

All of these details of construction tend to increase the utility, efficiency, and simplicity of the machine, enabling it to run the greatest length of time without loss of heat, and to be in every way easily manipulated with the most ordinary skill, both as to all necessary adjustments and to the application and removal of the irons, and also as to the dismemberment of the machine.

To unhouse the rolls, the upper roll is lifted by turning the lever g^2, the screw p is removed, and the slide-plate l slipped out, when the rolls may both be readily taken out.

We are aware that it is not new to hang the rolls so that they are removable. Nor is it new to apply spring pressure to the upper roll, nor to so arrange the upper roll that it may be raised or lowered, nor to apply doors to the rolls, all of our improvements relating to these points consisting in the details of construction or arrangement by which we effect the object desired.

We claim—

The described means for adjusting the upper frame and its roll in position relatively to the lower roll, the same consisting in the combination with the rod passing loosely through the boss and with the spring y, of the nut b^2, working upon a screw-thread at the top of the rod, substantially as shown and described.

Also, in combination with either fluting-cylinder, a cylindrical heating-iron, the main surface of which is kept from contact with the roll by a flange or flanges, substantially as described.

Also, in combination with the lower roll, a hinged handle or crank, which, when swunk into position for driving the machine, serves also as a cap or door for the roll, substantially as shown and described.

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Witnesses:
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