J. C. KNEELAND.

Machines for Piling Paper.

No. 197,477. Patented Nov. 27, 1877.

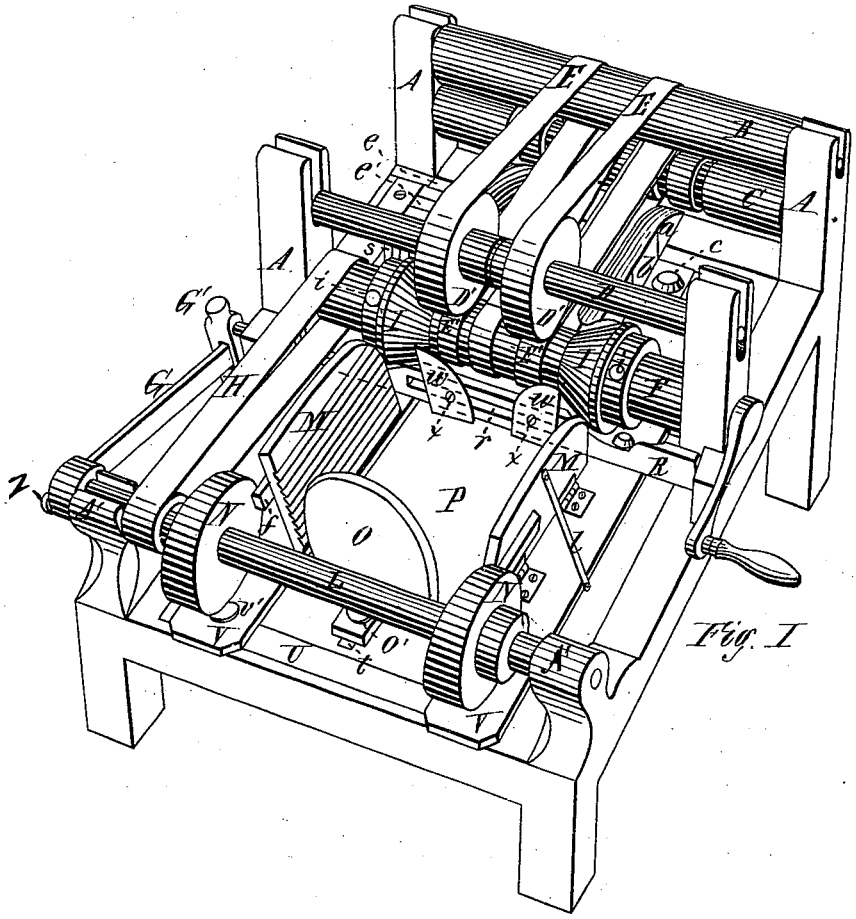

Fig. I

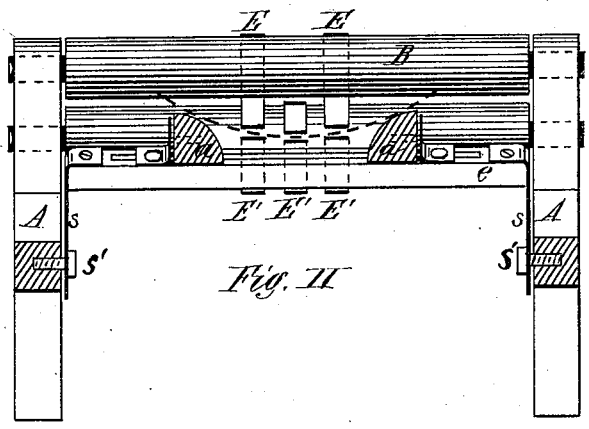

Fig. II

Attest:

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IMPROVEMENT IN MACHINES FOR PILING PAPER.

Specification forming part of Letters Patent No. **197,477**, dated November 27, 1877; application filed July 23, 1877.

To all whom it may concern:

Be it known that I, JOSEPH C. KNEELAND, of Northampton, in the State of Massachusetts, have invented a new and useful Improved Machine for Piling Paper; and that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon.

My invention relates to a machine for laying paper nicely and evenly in a pile as fast as it is delivered from a ruling-machine, or from a calender-machine; and it consists of a combination of guide-pieces with feed-belts, and of guide-rolls for causing the sheets of paper to assume a curved or bent form as they leave the feed belts or rolls, to cause such sheets to pass more certainly and directly to the table where they are piled; and it consists, also, of movable plates arranged at the sides of the platform where the paper is piled, and which plates are made to vibrate to and fro vertically against the edges of the sheets of paper by suitable mechanism, to cause the paper to lie evenly in a pile, all which will be more fully hereinafter described.

Figure I is a perspective view of my invention; and Fig. II is a vertical section through the horizontal adjustable guide-pieces, and showing the manner of attaching them to the machine.

In the drawings, A represents the frame of the machine, in which the rolls or shafts B, C, D, and F have their bearings, with the feed-belts E passing around pulleys D′ on the shafts D, or around the latter and the shafts B, and with the lower feed-belts E′ passing around the shafts F and C, the said shafts B, C, D, and F being so arranged or disposed in their bearings that the belts E shall press upon the belts E′ with the proper amount of friction, and both run at about the same rate of speed, so that a sheet of paper may be carried along between the belts when the machine is put into operation.

A bar, *e*, provided with a slot, *e′*, is secured at each end to a vertical slotted piece, *s*, with set-screws *s′* turned through said piece into the frame A, to set and retain the bar *e* at any desired elevation.

Two guide-pieces, *a*, one on each side, and preferably made convex on their upper sides, are secured to the bar *e*, and for the greater convenience of adjusting these guide-pieces at any point along the bar, they are secured thereto by a thumb-screw, or by a bolt passing down through the slot *e′*, and a nut beneath, or by any other suitable means, so that these pieces *a* may be set at any desired distance apart.

To the shaft F are fitted two conical guides, I, arranged to slide to and fro thereon, but which may be rigidly secured at any point in its length by a set-screw, *i*, turned into each guide and against the shaft, the feed-belts E′ passing around the shaft between the two guides I.

P is a platform or table, across the rear end of which extends a rock-shaft, R, to which are secured one or more plates, *w*, and said rock-shaft has a slot, *r*, therein, so that said plates *w* may be moved to any point thereon, and secured by a small set-screw, *x*. This rock shaft or bar R has a bearing at each end in the frame A, and a rocking or reciprocating rotary movement is given to it by the rod G and cranks G′, the rod being connected to the end of the rotating shaft L by an ordinary eccentric-pin, *z*.

Two plates, M, are hinged, one on each side of the platform or table P, to the movable pieces V, which latter may be secured at any desired point on the table by bolts or set-screws passing through the slots U, one at each end of the table; and the shaft L (having its bearings at A′ in the frame) is provided with two cams, N, which rotate, each, against a projection, *f*, upon the end of each plate M, and these cams N each being thicker at one side than at the other, and the inside of each being inclined, causes its adjacent plate M to be thrown inward at each revolution of the cams, and thrown outward again by a spring, *l*, attached at one end to the upper edge of the plate, and at the other end to the piece V.

The arrangement of the springs, however, is not essential, as the vibratory movement of

the plates M may be attained by making an inclined groove in the cams N, and having the projection *f* operate in the groove, which would be a better arrangement for a practically-operating machine. At the end of the table P, opposite the plates *w*, is a foot-board, O, attached and made adjustable, either nearer to the rock-shaft R or farther from it, by a bolt passing through the piece O′ and slot *t* in the table, with a thumb-nut on the bolt.

If the machine is put in motion by turning the shaft F, and a sheet of paper is passed in between the two rolls B and C at the rear end of the machine, it passes in between the feed-belts E and E′, and as these belts are close together, the paper is carried (by the pressure of the belts against each other) forward and delivered upon the table P. As the plane of contact of the belts E and E′ is somewhat below the top of the guides *a*, the sheet of paper, as it passes along, is caused to assume a curved or bent form, or concave upon its upper side, as shown in Fig. II, the rotary guides I upon the shaft F causing the sheet to keep that form as it passes out upon the table P. The belt H, passing around the shafts F and L, communicates a rotary movement from the shaft F to the shaft L, and the bar G communicates a rocking motion from thence to the rock-shaft R, causing the plates *w* to vibrate toward and from the foot-board O. As the cams N rotate they cause the plates M to vibrate also toward and from each other, and as the sheets of paper are discharged from between the feed-belts and upon the table, these plates M and *w*, as they vibrate, strike against the edges of the sheets of paper, and pile them up evenly in a package whenever the sheets do not of themselves fall properly into place.

The feature of causing the sheets, as they pass in succession from between the feed-belts to the table, to assume a curved form, I consider to be a most important one, as, in assuming such bent or curved form, the sheets are deposited in the right position with far greater certainty than when the sheet is flat. In the latter position, when passing rapidly from a ruling-machine, or from a calender, their motion is so rapid that after they leave the feed-belts the resistance of the air causes them to double together, and they do not, in that position, pass to the table properly, or are not deposited in the desired position.

The guides hereinbefore described entirely obviate this difficulty, as the sheet, when caused by the guides to assume a curved or bent form, are much stronger and more rigid, and are thereby made sufficiently stiff to entirely overcome the resistance of the air.

Of course, in practice, power is applied to turn the rolls, carrying the feed-belts E and E′, instead of the winch shown in the drawings, so that the sheets may pass between the rolls or feed-belts, and thence to the table, with the desired rapidity; and in piling the sheets into an even package, the inside surface of the plates M may be serrated or corrugated, as shown in the drawing, so that the plates may be more sure to engage with each sheet in piling the paper.

Having thus described my invention, what I claim as new is—

1. The combination, in a machine for piling paper, of the feed-belts E and E′, the rolls or shafts for carrying said belts, and the guides *a*, all substantially as and for the purpose herein described.

2. In a machine for piling paper, the combination of the feed-belts E and E′, the rolls or shafts for carrying said belts, and the conical rotary guides I, all operating substantially as and for the purpose specified.

3. The combination of the feed-belts E and E′, the table P, the vibrating plates M, the plates *w*, and the foot-board O, all operating to deposit and pile paper in a package evenly, substantially as herein set forth.

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