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## ATTACHMENT TO PAPER MACHINES TO PREVENT THE STRAINING AND BREAKING OF THE PAPER DURING MANUFACTURE.

No. 106,134. Patented Aug. 9, 1870.

*Fig. 1.*

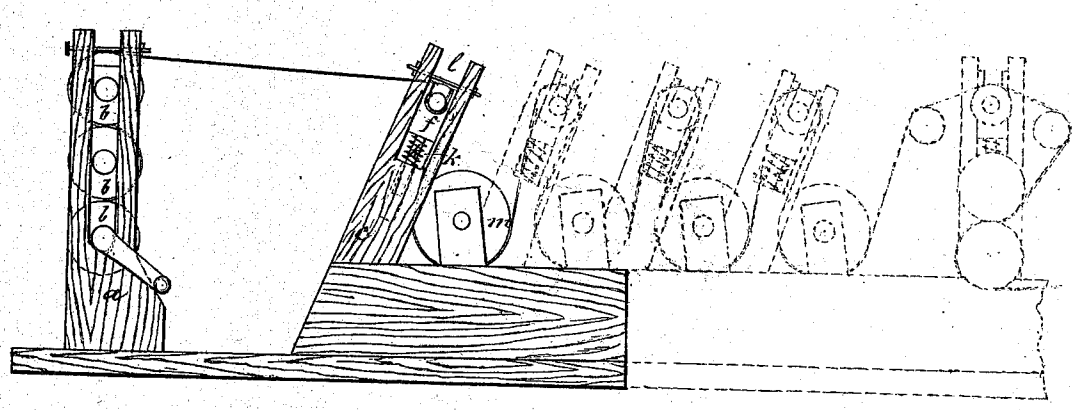


*Fig. 2.*

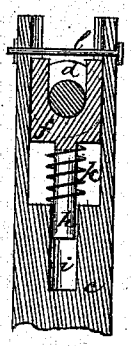


*Fig. 3.*

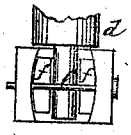
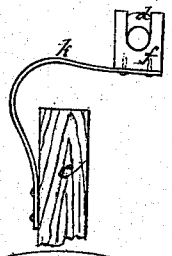


*Fig. 4.*



Witnesses.

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# UNITED STATES PATENT OFFICE.

LORENZO DEAN, OF FORT EDWARD, NEW YORK.

## IMPROVEMENT IN ATTACHMENTS TO PAPER-MACHINES TO PREVENT THE STRAINING AND BREAKING OF THE PAPER DURING MANUFACTURE.

Specification forming part of Letters Patent No. **106,134**, dated August 9, 1870.

*To all whom it may concern:*

Be it known that I, LORENZO DEAN, of Fort Edward, in the county of Washington and State of New York, have invented a new and Improved Attachment for Preventing the Straining and Breaking of Paper during its Manufacture; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of a stand of drying and calender rolls in a paper-machine. Fig. 2 is a sectional elevation of my attachment for preventing strains and breakage. Fig. 3 is a plan view of the same, and Fig. 4 is a detached view of a variety of Fig. 2.

This invention has for its object to prevent the straining and breakage of the paper sheet at any point during its passage through the machine prior to its reaching and passing between the calender-rolls, having especial reference to the prevention of breakage while the sheet is passing from the drying to the calender rolls.

The invention consists in sliding boxes placed in vertical or inclined standards or the equivalents, and supported upon springs, in which boxes the journals of the carrying-roll, over which the sheet passes on its way from the drying-roll to the calenders, are mounted, the springs enabling the boxes and the carrying-roll to yield to the strain exerted upon the same by the sheet, and thus prevent the rupture of the latter.

In the drawings, *a* is one of the standards in which the calender-rolls *b* are mounted. *c* is one of the inclined standards in which the carrying-roll *d* is mounted. *e* is a longitudinal recess in the top of the standard *c*. *f* is a box placed in the recess *e*, and provided with a stem, *h*, which projects downward into an orifice, *i*, in the standard, below the recess *e*. *k* is a spiral spring, that surrounds the stem *h*, rests upon the bottom of the recess *e*, and supports the box *f*. *l* is a rivet that connects the two branches of the standard *c*, and prevents the box *f* from rising, owing to the operation of the springs *k*, too high in the recesses *e*. *m* is the drying-roll; *n*, the paper sheet.

In passing through the machine the sheet is liable to be strained while in its moist and slightly-coherent condition, especially in cylinder-machines, where the grain runs but one way, and these weakened portions of the sheet are liable to suddenly give way under the tension at any point between the carrying-roll and the calenders, where it is subject to a steady and uniform pressure. If the yielding boxes, supported upon springs, as herein described, be freely distributed throughout the machine at all points where there are rollers over which the sheet passes, they prevent in a great measure all such straining and breaking. The sides of the recess *e* are made concave, and the sides of the boxes *f* correspondingly convex, as shown in Fig. 3, in order to prevent the latter from slipping out of the standards.

I do not limit myself to the manner of combining the box and spring herein described, as other equivalent modes may be adopted. In Fig. 4, for instance, the springs are attached at one end to any part of the frame, and bent upward and backward over the tops of the same to reach the rolls, and the boxes formed on the springs, and the roll mounted in the boxes. This is a convenient arrangement where standards cannot be used and the strain on the paper is light.

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

The standard *c* or other part of the frame, in combination with the box *f* and spring *k*, substantially as described.

LORENZO DEAN.

Witnesses:

JAMES MCINTYRE,

PATRICK O'BRIEN.