(No Model.)

J. KINGSLAND, Jr.

PAPER MACHINE.

No. 407,534. Patented July 23, 1889.

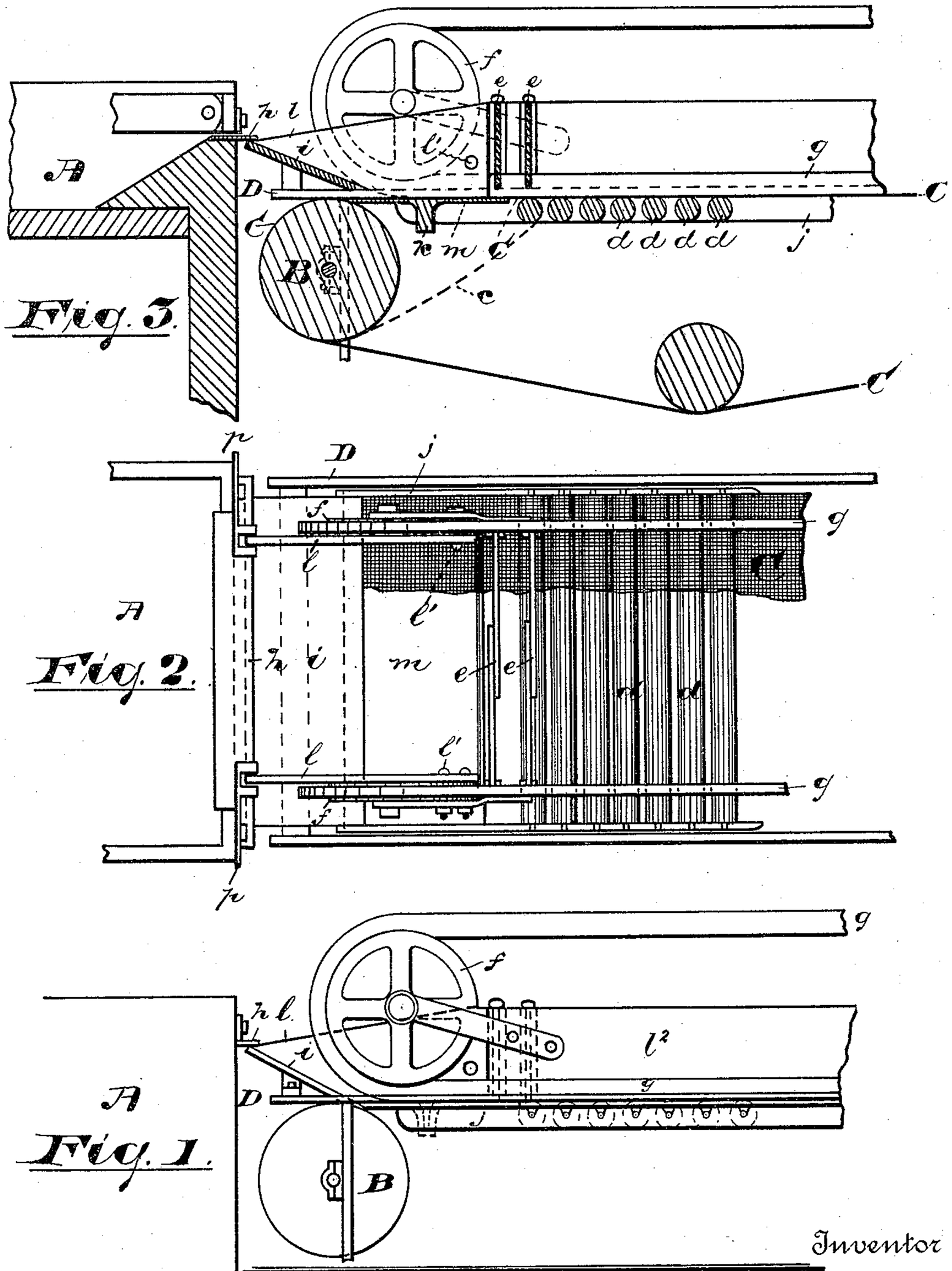

Fig. 3.

Fig. 2.

Fig. 1.

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JOSEPH KINGSLAND, JR., OF NUTLEY, NEW JERSEY.

PAPER-MACHINE.

SPECIFICATION forming part of Letters Patent No. 407,534, dated July 23, 1889.

Application filed April 26, 1887. Serial No. 236,190. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH KINGSLAND, Jr., a citizen of the United States, residing at Nutley, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Paper-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to dispose the fiber of the paper-pulp upon the wire-cloth of the paper-machine in such a manner as to enable the paper to be torn as readily and easily in one direction as in a direction at right angles thereto, whereby it is made to resemble hand-made paper more closely.

The invention consists in the combination and construction of parts, substantially as will be hereinafter described, and finally be embodied in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a side elevation of the improved device. Fig. 2 is a plan of the same, and Fig. 3 is a central longitudinal section.

In said drawings, A indicates the usual picker-vat, into which the usual pulp-screen is arranged, said screen, however, not being shown, as it forms no part of my improvements.

B represents the usual breast-roll, from and over which the wire-cloth C is stretched. *d* are the ordinary tube-rolls for supporting the said cloth, and *f* is a front guide-wheel for carrying the ordinary dekle-strap *g*, which serves to limit the lateral flow of the pulp on the wire-cloth and give width to the sheet of paper.

The features of the machine thus referred to are of ordinary construction and arrangement.

To the forward edge of the vat is a projecting lip *h*, of metal, wood, rubber, or other suitable material, and to the machine-frame D, of the usual construction, is secured an upper rigid and inclined apron *i*, which extends forward toward the vat and upward to a point directly beneath the lip, the said upper apron having a slight lateral vibration with the frame of the machine, by which the pulp is spread evenly on the surface.

Heretofore in the paper-machines more commonly in use having the wire supported by the tube-rolls *d d*, as shown, the said machines have generally been provided with a flexible apron or cloth extending from the vat to a point on the wire-cloth closely approaching the slices *e*. By this construction an exposed portion of the wire-cloth remained between the end of the apron and said slices, through which wire-cloth much of the water of the pulp passed before the movement of the said wire-cloth brought the pulp to the said slices. When the said pulp passed under the influence of the slices it had lost considerable of its water and was in such a thickened condition that the action of the slices tended to draw the fibers so that they were disposed longitudinally in the sheet, in which relation they remained, and when formed in the finished paper they materially affected the tearing of the sheet, so that in one direction—that in which the pulp flowed or was carried by the cloth—the paper could be torn more easily than in a direction at right angles thereto.

In the improved machine I have provided means whereby the fibers are not to the same extent disposed longitudinally, and as a result the paper is made without that property commonly known as "grain," or at least the grain is made less apparent, and the paper is given peculiar evenness and strength.

In the improved construction I have provided a second apron or supplemental apron *m*, arranged beneath the wire-cloth and extending from a point close to the periphery of the breast-roll or beneath the edge of the upper apron *i* to a point to or beyond the slices, the said supplemental apron lying between the breast and tube rolls up close to the under side of the wire-cloth, and thus preventing the passage of water therefrom at any point between the breast-roll and slices or between the lower edge of the upper apron *i* and said slices.

The supplemental apron is held in place in the frame of the machine in any suitable

manner; but I prefer to secure it at its opposite ends to the tube-roll frame *j*. The under side of the supplemental apron may be provided with a brace *k*, extending longitudinally from one side of the machine to the other to stiffen the apron. Said supplemental apron may be of wood, metal, or other suitable material; but I prefer sheet-brass, in that it is durable and not liable to rust.

The upper apron *i*, I prefer to make of hard rubber. This is rigidly secured in place in the frame of the machine.

In connection with the improved apron I have provided side pieces *l l*, which are preferably secured rigidly and permanently to the ordinary dekle-frame l^2, which is laterally adjustable in any ordinary manner over the wire-cloth to enable the dekle-strap to be adjusted so as to increase or diminish the width of the paper, said side pieces *l* being secured to said dekle-frame l^2 by means of bolts l', said side pieces moving laterally with the said frame when it is desired to widen or reduce the width of the paper. The said side pieces, where they engage the upper apron on the wire-cloth, are suitably packed with rubber or other suitable material; or said joints may be nicely fitted, so as to prevent the passage of water therethrough, without the use of any packing. Said side pieces may be of hard rubber with soft-rubber edges where they engage the apron. The mouth of the vat being, as in the ordinary machine, of one invariable size, I have provided in the improved construction sliding pieces *p p*, by which the said mouth is contracted or widened to correspond with the desired width of the wire-cloth to be employed in making paper. Said sliding pieces *p p* may be permanently connected with the said side pieces *l l* to work with same, or they may be arranged to move independently by hand.

I am aware that various changes and modifications and equivalent methods of arranging parts may be employed other than I have described herein without departing from the spirit or scope of this invention. For example, I may provide an endless belt which may be stretched beneath the wire-cloth from the breast-roll B over co-operating rolls, as indicated in dotted line at *c*, so as to lie beneath the wire-cloth and move therewith from said breast-roll and accomplish practically the same result as herein described; but, because the device first described is more durable and a less expensive method or arrangement, I wish to claim the said first arrangement specifically herein.

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

1. In a paper-machine, the combination of the machine-frame D, tube-roll frame *j*, tube-rolls *d d d*, a breast-roll B, wire-cloth disposed on said breast and tube-rolls, slices *e*, arranged over said wire-cloth, and a supplemental apron *m*, arranged underneath the wire-cloth between said breast-roll and tube-rolls *d d*, substantially as and for the purposes set forth.

2. In a paper-machine, the combination of the machine and tube-roll frames, a breast-roll, series of tube-rolls, a wire-cloth arranged over said breast-roll and lying upon the series of tube-rolls, slices, a supplemental apron *m*, arranged beneath the wire between the tube-rolls and breast-roll, and an upper apron *i*, rigidly secured to the machine-frame and extending to the wire-cloth, the said supplemental apron underlying the said upper apron at one edge and terminating at the slices, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of April, 1887.

JOSEPH KINGSLAND, JR.

Witnesses:

CHARLES H. PELL,

OSCAR A. MICHEL.