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Dan^{l} Crosby.

PATENTED FEB 14 1871

Method of Smoothing and Pressing Paper.

Fig. 2

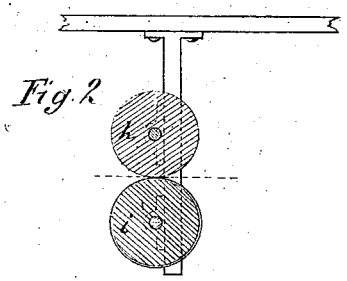
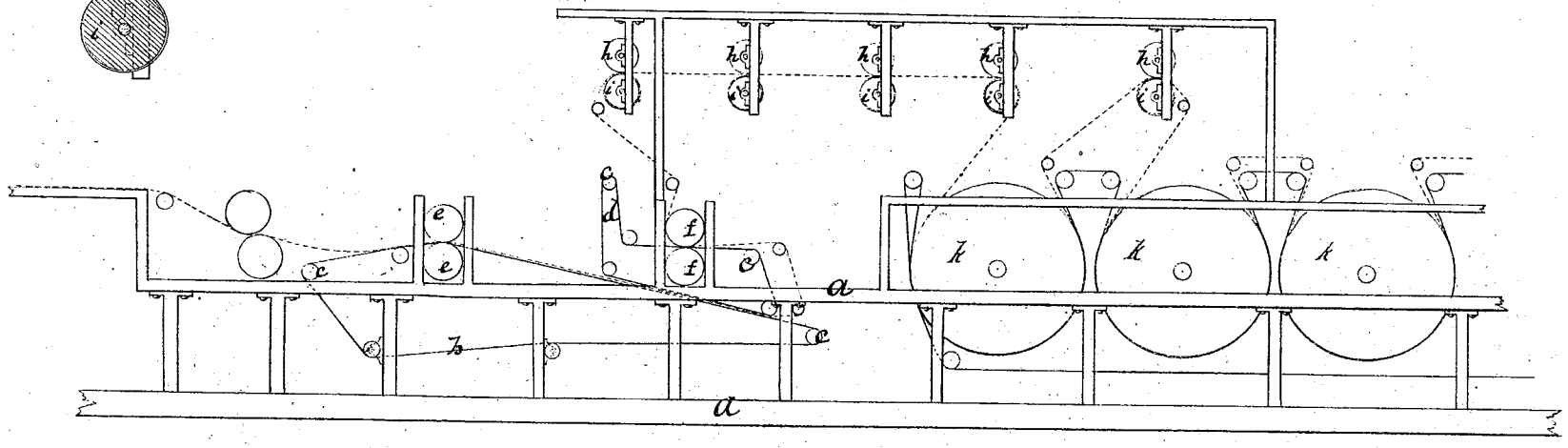


Fig. 1



Witnesses.
H. J. Boetz
C. O. Brown

Dan^{l} Crosby. Inventor
by Geo. E. Brown.
his Attorney.

United States Patent Office.

DANIEL CROSBY, OF HAMPDEN, MAINE.

Letters Patent No. 111,820, dated February 14, 1871.

IMPROVEMENT IN APPARATUS FOR SMOOTHING AND PRESSING PAPER DURING THE MANUFACTURE.

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

I, DANIEL CROSBY, of Hampden, Penobscot county, Maine, have invented an Improvement in the Method of Smoothing and Pressing Paper, of which the following is a specification.

Figure 1 is a side elevation, and

Figure 2 is a sectional elevation.

This improvement applies to that part of the paper-making machine by which paper is pressed and smoothed while in a wet state. All such machines employ two or more pairs of horizontal press-rolls, and, in connection with each pair, an endless apron of felt, supported upon smaller cylinders and extending to each side of the press-rolls, one branch of the felt passing between the latter. The felts, each with its pair of press-rolls, form a series arranged lengthwise of the machine, the paper passing from one felt to another, the functions of the felts being to conduct the paper between the rolls to absorb the moisture expressed from the paper by the rolls, and in proportion as the latter operation approaches completion to impart a certain smoothness to the surface of the paper.

My improvement consists in the substitution for the discharge of this latter function of a jacket of any suitable material covering the lower press-roll instead of the endless apron of felt.

I use as many sets of press-rolls and felts as may be necessary to take out so much of the water as to leave the paper, while still somewhat wet, yet sufficiently tenacious to cohere while being removed from the last felt by means of the common wooden rolls. Then, to perform the smoothing operation, dispensing with the additional felt heretofore employed and retaining the press-rolls, I cover the lower one of each pair with a suitable jacket, the upper one remaining uncovered and smooth, and between the smooth and the jacketed press-rolls I cause the wet paper to be passed by the wooden rolls aforesaid. In other words I contract the felt to the limit of the circumference of the lower press-roll.

The advantages accruing from this improved method are—

First, the production of a better quality of paper, inasmuch as within the space required for a felt can be placed a series of five or six pairs of press-rolls with jack one of which pairs is capable, of itself, of imparting the same degree of smoothness to the surface of the paper that one pair of press-rolls with a felt would impart, and, *a fortiori*, all the jacketed press-rolls that occupy the room of one felt are capable of imparting a higher finish than the apparatus whose place they take.

Second, a saving of expense, inasmuch as the number of press-rolls that can be used to advantage in any given space costs much less than the pair of press-rolls with a felt that should occupy the same place.

The operation of the series of upper smooth rolls and lower jacketed rolls upon the paper while in a moist and plastic state is to improve its surface and texture; in other words, to accomplish the same effect that calenders produce after the paper has passed between the drying-rolls.

It should be understood that the series of smooth and jacketed rolls intervenes between the last felt and the last drying-roll.

Referring to the drawing, in which the dotted line represents the paper—

a is a section of the frame of a paper-making machine;

b d are two felts supported upon small wooden cylinders *c*, and placed end to end lengthwise of the frame;

e e are the press-rolls, between which the felt *b* passes; and

f f are those between which the felt *d* passes.

h are the smooth upper press-rolls, and *i* the jacketed lower press-rolls of the series that form the substitute for the third felt, or for the fourth felt when three felts are required for bringing the paper to the proper degree of moisture.

k are the drying-rolls.

I claim as my invention—

The method of smoothing and compressing paper while in a moist state, by passing it between one or more pairs of press-rolls, the upper ones of which are smooth and the lower ones jacketed with any suitable material, as described.

DANIEL CROSBY.

Witnesses:

E. J. DUDLEY,

JOHN CROSBY.