(No Model.)

M. R. FLETCHER.

DOUBLE EMBOSSING MACHINE.

No. 304,417. Patented Sept. 2, 1884.

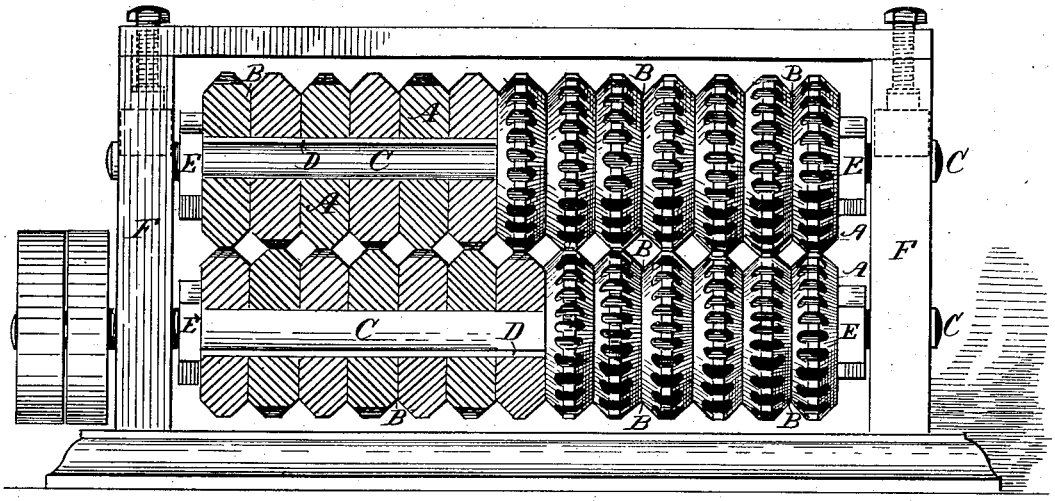

Fig. 1.

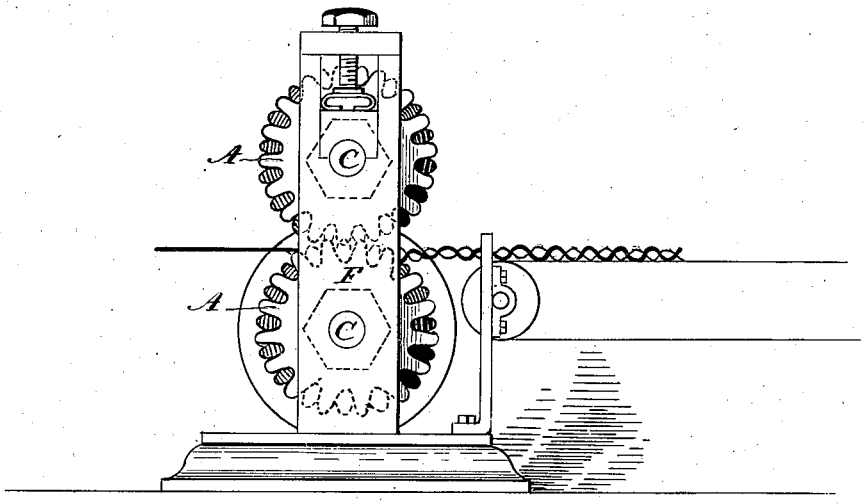

Fig. 2.

Witnesses.
A. F. Pierce
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UNITED STATES PATENT OFFICE.

MOORE R. FLETCHER, OF BOSTON, MASS., ASSIGNOR OF FIVE-EIGHTHS TO CHARLES G. PATTERSON, OF SAME PLACE, AND CHARLES H. HUNT.

DOUBLE-EMBOSSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 304,417, dated September 2, 1884.

Application filed December 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, MOORE R. FLETCHER, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Double-Embossing Machines; and I do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

The special purpose of my machine is the corrugation of thin sheets of paper-like fabric passed between the rollers, the teeth of which doubly emboss or form alternate protuberances and depressions in the material, as is fully set forth in my application for Letters Patent on such fabric filed simultaneously herewith.

The essential novelty of my improved machine consists in a pair of rollers having surfaces formed with a series of detached independent bosses or protuberances with intermediate depressions—such as would be produced by a succession of cog-wheels arranged side by side on a shaft—with each tooth laterally opposite one of the spaces in the adjacent wheel of the same roller. These rollers are mounted in bearings in a suitable frame, so as to mesh together, and are provided with means of rotation, and, if required, with pressure mechanism, adjusting apparatus, and gearing.

In the drawings, Figure 1 is a side elevation, partly in section, of my improved machine; Fig. 2 an end view thereof, illustrating the process of corrugating a sheet of pulp or other material.

The best form of roller for my purpose is indicated in the drawings. A series of toothed wheels, A, beveled on each side to form grooves B, are arranged side by side on a shaft, C, to which they are secured by a spline, D, fitted in a groove or key-seat of the shaft and wheel. The several wheels are held in position on the shaft by threaded nuts E, screwed thereon or otherwise. The rollers are mounted in bearings in uprights F, may be connected by fine gears to prevent back-lash, and may be rotated by hand or by power. Springs and pressure-screws may be furnished, if desired. Each tooth of every wheel A is opposite a space in the adjacent wheel, so as not to flute or simply form continuous transverse corrugations in the fabric passed between the rollers, but to break up the corrugations or form alternate elevations and depressions in the material, not only lengthwise by the successive teeth and spaces of the wheels A, but also crosswise and obliquely by the alternation of tooth and space in adjacent wheels, as shown. For uniformity, convenience, and economy in cutting these teeth, I arrange the disks from which the wheels are to be formed on a shaft and plane or mill out their spaces by a continuous movement of the cutting-tool over the entire series, all being held true by a spline in their key-seats. I then remove them from the shaft, and form in half or all of them another key-seat at such distance from the first as will permit the wheels to be replaced in the alternate position described—that is, with their teeth opposite the adjacent spaces. The two rollers are the reverse of each other so far as to mesh together with space sufficient for the material, which enters as a flat sheet and emerges doubly embossed upon a table or an endless carrying-belt, as indicated in Fig. 2.

It is obvious that, instead of making the rollers of a series of toothed disks, they might be cast solid or milled out from a single piece to give the general surface described; or a plane roller may have rounded teeth set into it. The rollers are shown as placed with the disks directly opposite to each other; but I have accomplished very satisfactory results when the teeth of one roller were nearly or quite opposite the grooves B of the other, the corrugations of the material being strongly marked and broken up, and the fabric shirred, fulled, and wrinkled between the extremes of elevation and depression, as it is in the ordinary position of the rollers.

I am aware of the Patent to Newton, No. 235,698, dated December 21, 1880, in which is described a series of plain rollers with two fluted rollers, the flutes of which run in zigzag lines without any break or alternation of elevations and depressions from end to end of each roller, and without the arrangement peculiar to my invention of a tooth or boss opposite each space longitudinally in each roller. I disclaim all that is set forth in said Newton patent.

I claim as my present invention—

1. A double-embossing machine having in a suitable frame a pair of intermeshing rollers, each presenting in its surface a succession of detached independent bosses, with corresponding intermediate depressions arranged in longitudinal and transverse series, substantially as and for the purpose set forth.

2. In a double-embossing machine, a pair of circumferentially-grooved rollers, each formed of a succession of toothed disks arranged upon a shaft, with each tooth opposite a space in the adjacent disk, for the purpose set forth.

In testimony whereof I hereto affix my signature in presence of two witnesses.

MOORE R. FLETCHER.

Witnesses:
A. H. SPENCER,
E. A. PHELPS.