

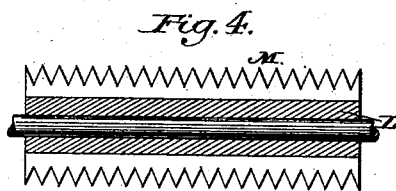
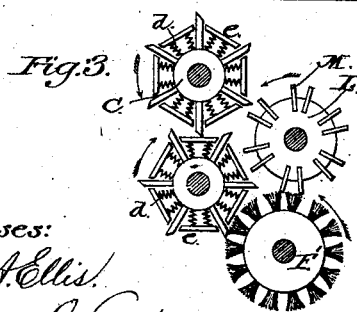
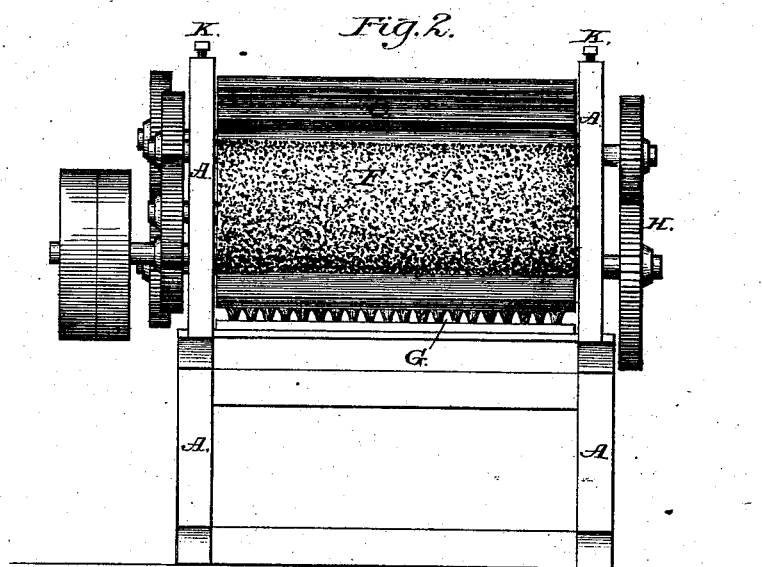
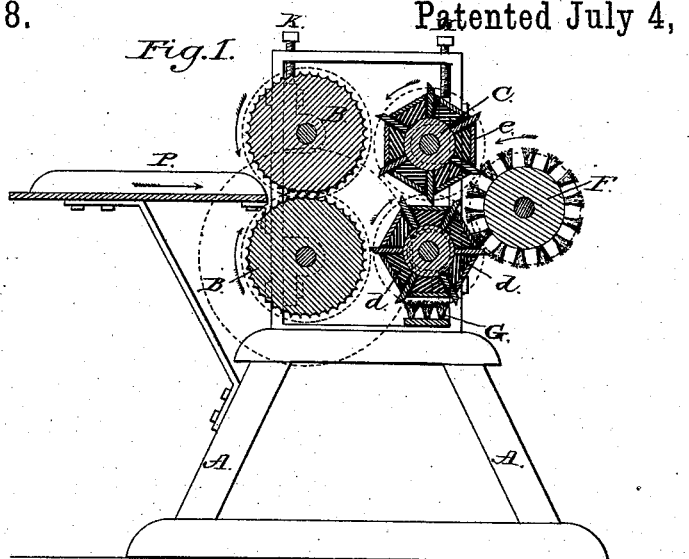
(Model.)

A. ANGELL.

MACHINE FOR CLEANING THE LEAVES OF FIBROUS PLANTS.

No. 260,518.

Patented July 4, 1882.



Witnesses:
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UNITED STATES PATENT OFFICE.

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MACHINE FOR CLEANING THE LEAVES OF FIBROUS PLANTS.

SPECIFICATION forming part of Letters Patent No. 260,518, dated July 4, 1882.

Application filed April 21, 1882. (Specimens.)

To all whom it may concern:

Be it known that I, ALBERT ANGELL, of East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Machines for Cleaning the Leaves of Fibrous Plants; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to that class of machines for cleaning the leaves of fibrous plants in which the outer coating of the leaf is removed by being scraped and brushed off from the underlying fiber; and it consists of a pair of rollers or shafts each armed with the same number of radial scraping-blades, having their interspaces filled in to present a comparatively soft, yielding, or elastic surface, and which are geared to revolve in unison, so that the blades upon the one shall drop in against the intermediate elastic or yielding surface between the blades upon the other; and in the combination, with this pair of scraping-rollers and the supporting blocks or cushions between their blades, of a pair of feed-rollers on the one hand and of revolving and stationary combs and brushes on the other, the object of my invention being to remove simply, expeditiously, and completely the outer covering and fleshy substance of the leaf and leave its fiber free and clean.

In the accompanying drawings, Figure 1 is a transverse sectional view of my improved fiber-cleaning machine; Fig. 2, a rear elevation thereof; Fig. 3, a sectional view of the scraping-rollers detached, illustrating the combination of both combs and brushes therewith; and Fig. 4, a longitudinal section of the comb-roller, illustrating one of the forms of combs adapted for use with the machine.

The frame of the machine is designated by the letter A, its feed-rollers by the letter B, and its scraping-rollers by the letter C.

The feed-rollers B are by preference longitudinally grooved or corrugated to take firmer hold of the leaf, and are adapted to either cut the outer coating of the leaf passed between them or to loosen the same by pressure and friction.

Where it is designed to cut the coating of the leaf the longitudinal ribs or corrugations on one or both rollers are made sharp and cutting, as shown in Fig. 1. Where the coating is to be loosened by friction the rollers are properly corrugated to simply compress and rub the leaf passing between them. Whatever the form of the feed-rollers, it is contemplated, where the thickness of the leaf shall require it, to combine with them a pair of crushing-rollers, between which the leaves shall pass before reaching these feed-rollers.

The two scraping-rollers C, placed in the rear of the feed-rollers B, on a line therewith, are each armed with a series of longitudinal blades arranged to project therefrom radially at equal distances apart, and whose outer edges are all beveled off and sharpened in the same direction, presenting a straight, true, and sharp edge to the leaf as it approaches it. The spaces or intervals between the blades are filled in either with hard wood, a soft metal—such as lead, brass, or some suitable metallic alloy—an elastic or semi-elastic substance or compound, or, as illustrated in the drawings, by an elastic base, *d*, of rubber (see Fig. 1) or series of spiral springs, *s*, (see Fig. 3,) upon which is secured an outer facing-plate, *e*, of brass or other suitable metal.

The two scraping-rollers are each fitted with the same number of blades, and are so mounted and geared together as that the blades on the roller shall fall centrally between the blades on the other roller into contact, or very nearly so, with the facing-plate *e* or the face of the elastic or yielding material *d*, interposed between the blades. A third roller, F, mounted in the frame back of the scraping-rollers C, is armed with a series of longitudinal radial brushes of bristles, fine wire, or other suitable material, and is so supported as that the brushes shall, as the rollers revolve, strike in against the face of each of the spaces between the blades on the lower scraping-roller, as shown in Fig. 1, while the blades themselves shall drop in between the brushes.

The blades of the upper scraping-roller will be kept clear and clean by the action of these brushes, and the blades of the lower scraping-roller are in like manner kept free from the

gumming coating of the leaf scraped off thereby by a fixed brush, G, secured in place under said roller, as shown in Figs. 1 and 2.

The feed-rollers may be geared together to revolve in unison. The two scraping-rollers and the brushing-roller are likewise geared together to revolve at the same speed; but the train of feed-rollers and the train of scraping and brushing rollers are so geared by intermediate cog-wheels, H, (see Fig. 2,) as that the scraping and brushing rollers shall rotate six or eight times as fast as the feed-rollers.

Both the feed-rollers B and the scraping-rollers C are made adjustable in their bearings, so that the distance between the rollers in each pair may be regulated at will by means of set-screws K K, either with or without interposed springs, the effect whereof would be to permit an automatic elastic adjustment of the rollers in either set.

For use with that class of fibrous leaves in which it is advantageous to comb out and separate the fibers in cleaning the same, a roller, L, armed with longitudinal combs constructed either of serrated plates M, (see Fig. 4,) or otherwise, of a series of elastic teeth of any approved pattern, may be substituted for the brushing-roller F, being so mounted to rotate in the frame as that its revolving teeth, clearing the blades on the upper scraping-roller, shall pass in between the blades on the lower roller into close proximity to the intervening elastic cushion or supporting-plate e, as shown in Fig. 3. In this case a brushing-roller, F, may be mounted below the combing-roller, so that its brushes shall sweep the combs and also pass in between the scraping-blades on the scraping-roller to brush and clean the fiber after it has been combed by the teeth of the combing-roller.

The leaves are supplied to the feed-rollers B through a suitable feed-box, P, which may be fitted with an endless belt to provide for their constant and automatic delivery. The leaves, being caught between the feed-rollers, are slowly fed forward by their revolution, and, if the rollers are made sharp for the purpose, the tough outer coating of each leaf is cut or gashed transversely as it passes between them. As they emerge from the feed-rollers the leaves are caught by the rapidly-revolving blades of the scraping-rollers, and, being led in between them, are struck by the blades first from the lower and then from the upper side in very quick, rapid succession up and down against the elastically-yielding plates e, or against the wooden blocks or other yielding or elastic material employed as a cushion between the blades. As each leaf is thus thrown against and supported upon the hard surface of the elastically-yielding cushion the scraping-blade passes over it and scrapes and draws from the fiber the coating thereon. This operation is

performed and the leaf scraped bit by bit alternately, first on the one side and then on the other, with great rapidity. As the leaves pass out from the scrapers they are next struck either directly by the brushes of the brushing-roller F, as shown in Fig. 1, which operates to remove all adhering bits and particles of the gummy coating, or else first by the combs of the combing-roller L and then by the bristles of the brushing-roller F, as shown in Fig. 2, and the fiber passes from the lower rollers onto a frame or an endless belt in a clean, well-dressed condition. Stationary brushes G may be employed to keep the blades not only of the lower but also of the upper scraping-rollers clean.

The machines may be constructed of small size, with narrow rollers to be operated by hand-power, or be constructed of large dimensions to be driven by horse or steam power.

I claim as my invention—

1. In a machine for cleaning fibrous leaves, the combination, with a series of radial scraping-blades upon a shaft or roller, of an elastic or yielding base or supporting-block filling each of the spaces between said blades and adapted to support the leaves while being scraped by the blades of a corresponding shaft or roller, substantially in the manner and for the purpose herein described.

2. In a machine for cleaning fibrous leaves, a pair of rollers whose peripheries each present an alternate succession of scraping-blades and interposed elastic or yielding supporting-surfaces, and which are geared to rotate in unison toward each other, so that the blades upon each roller shall pass in regular order over or against one of the elastic or yielding surfaces upon the other, substantially in the manner, for the purpose herein described.

3. In a machine for cleaning fibrous leaves, the combination, with elastic or yielding surfaces interposed between the radial blades of a scraping-roller, of brushes arranged upon a shaft or roller revolving toward the scraping-roller and adapted to sweep over said interposed surfaces, substantially as herein described.

4. In a machine for cleaning fibrous leaves, the combination, with elastic or yielding surfaces interposed between the radial blades of a scraping-roller, of a series of radial combs arranged upon a shaft or roller revolving toward the scraping-roller and adapted to sweep over said interposed surfaces, substantially as herein described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT ANGELL.

Witnesses:

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DAVID A. BURR.