

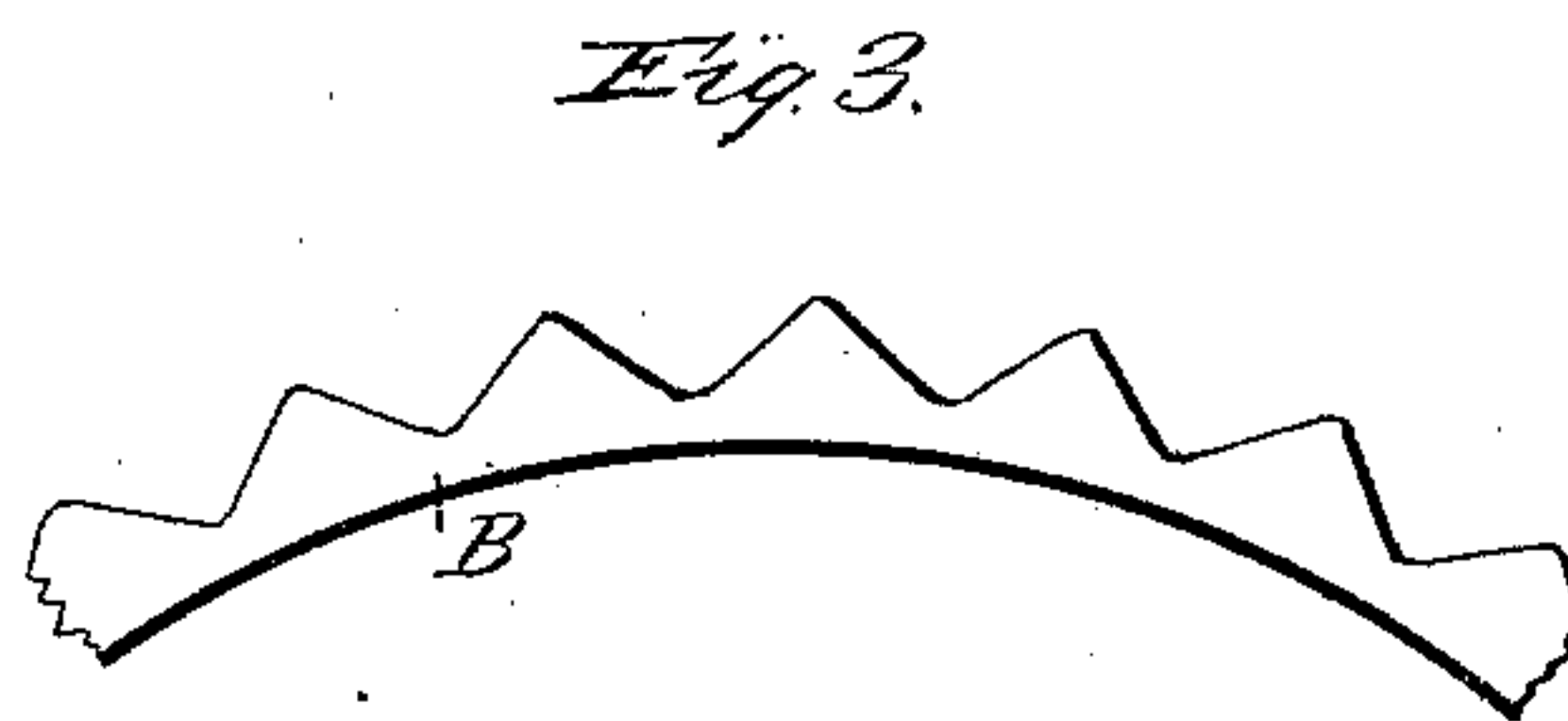
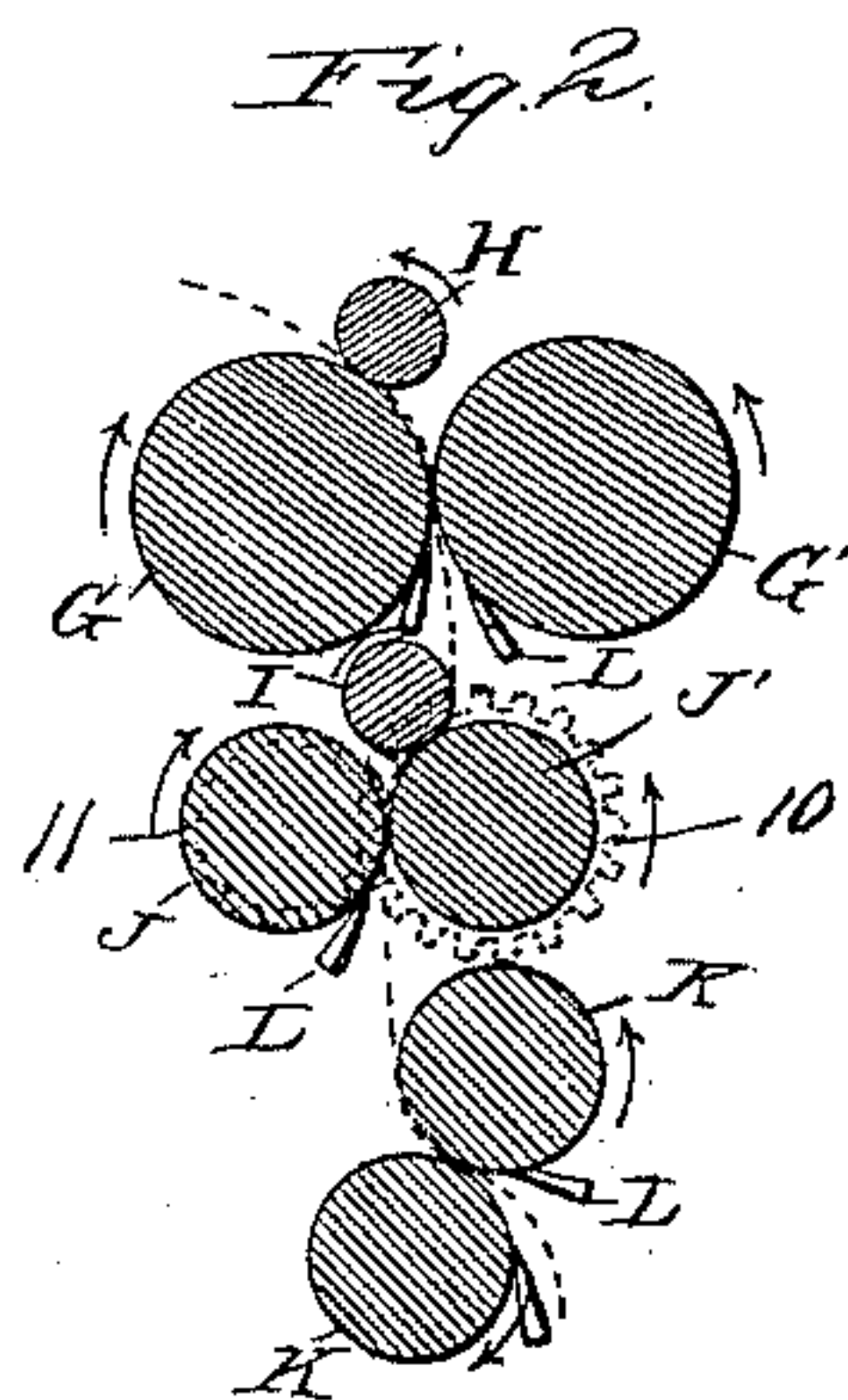
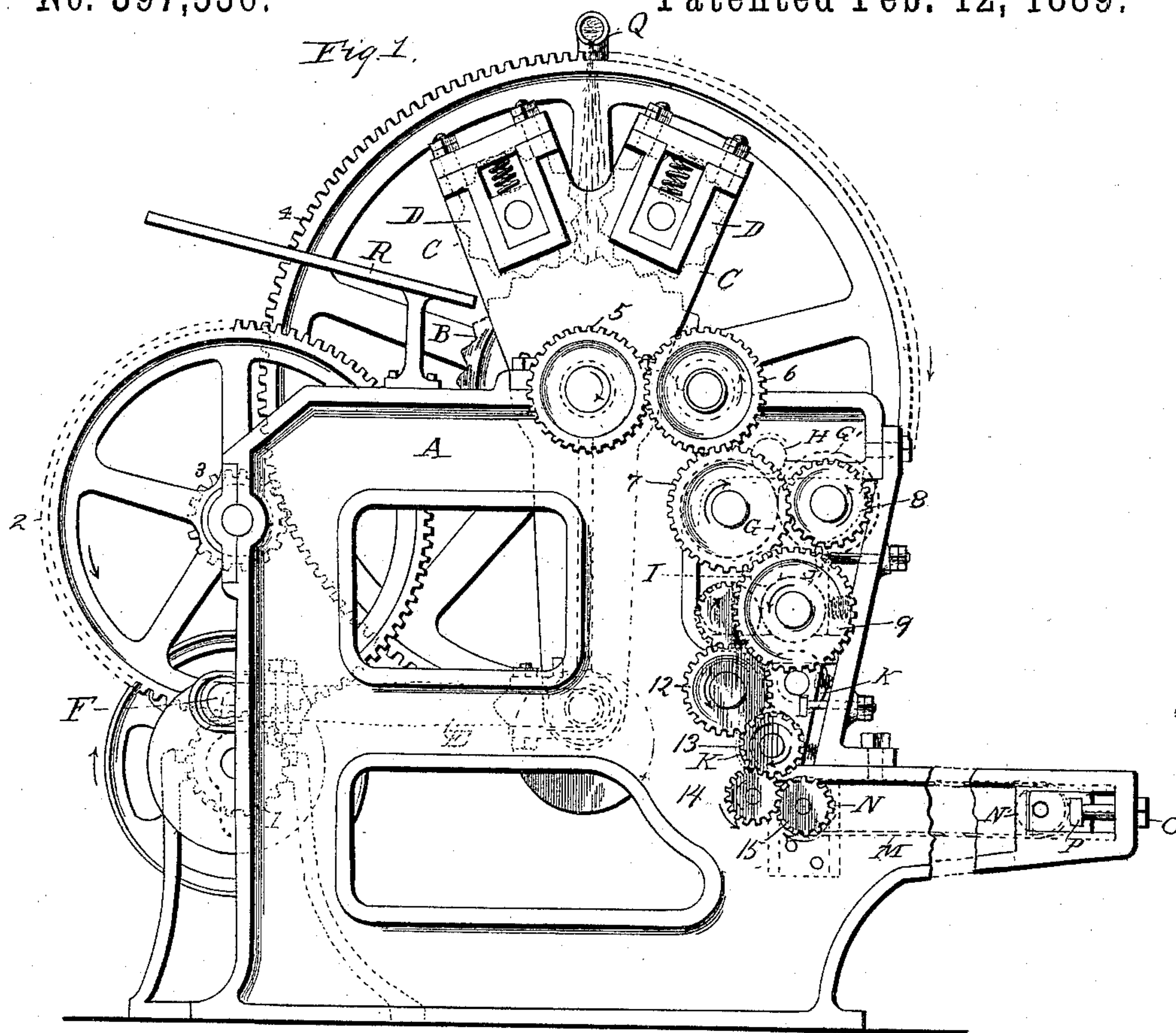
(No Model.)

R. H. COLLYER.

MACHINE FOR DECORTICATING FIBROUS PLANTS.

No. 397,536.

Patented Feb. 12, 1889.



WITNESSES:
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ROBERT H. COLLYER, OF NEW ORLEANS, LOUISIANA.

MACHINE FOR DECORTICATING FIBROUS PLANTS.

SPECIFICATION forming part of Letters Patent No. 397,536, dated February 12, 1889.

Application filed February 13, 1888. Serial No. 263,823. (No model.) Patented in England April 6, 1887, No. 5,097.

To all whom it may concern:

Be it known that I, ROBERT H. COLLYER, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Machines for Decorticating Fibrous Plants, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This improvement relates to a machine designed to prepare vegetable fibers from the ramie, jute, or other similar plants yielding fibers suitable for textile or other purposes, for parts of which I obtained an English patent dated April 6, 1887, No. 5,097; and the invention consists in the peculiar construction, arrangement, and combinations of parts, hereinafter more particularly described, and then definitely pointed out in the claims.

20 In the accompanying drawings, which show what I now consider the preferable form of carrying out my invention, Figure 1 represents a broken side elevation of my improvement; Fig. 2, a vertical cross-section of the rollers constituting a part of my invention; and Fig. 3 is an enlarged detail, which will be hereinafter more fully described.

Referring now to the details of the drawings, A represents the frame of my machine; 30 B, a drum or roller mounted therein, having a series of angular corrugations or flutes across its face. On the axis of this roller are mounted two frames, C, carrying smaller rollers, D D, correspondingly grooved or fluted and working over the large drum or roller B. The rollers D D are mounted in yielding boxes, as shown, so as to cause these rollers to bear with an elastic or yielding pressure on the periphery of the large drum or roller B. The frames 40 C are connected at their lower ends to a pitman, E, operated by a crank, F, which imparts a rapid oscillatory or curvilinear reciprocating motion to the said frames C, and thus causes the rollers D D to move backward and forward over the main roller B. The crank is connected by gearing 1 2 3 4, as shown, so that the crank F rotates about forty times as fast as the roller B, and thus the frame C and the rollers D make about forty oscillations 50 during the time the roller B is making one revolution, from which it will be seen that the

motions or relative speeds of the rollers B and D D produce a percussive or beetling action between the acting faces of roller B and those of the rollers D.

55 On the right-hand side of the machine are shown a series of rollers, (seen best in Fig. 2,) which act on the fiber after it has left the rollers B and D. The upper pair of rollers, G G', revolve at different speeds, the roller G' 60 moving the fastest, while the roller G has a smaller or grip-roller, H, pressing upon it. Beneath these rollers is another grip-roller, I, which presses upon a roller, J', forming one of the pair of rollers J J', which also have a 65 differential motion, the roller J moving the faster. Below these rollers is a pair of rubber squeezing-rollers, K K.

Beneath the different rollers are scrapers or directors L, which serve to clear the rollers 70 and to direct the material being acted upon in the right direction. Beneath the last pair of rollers is an endless apron, M, mounted on rollers N N', the latter being provided with a movable bearing, by which it may be adjusted by the aid of the bolt O and nut P in 75 a manner well understood.

Above the pair of rollers D is a perforated water-pipe, Q, arranged to discharge water between said rollers D upon the material being 80 operated on.

The operation of the machine is as follows: The stems of the ramie (which are preferably in the fresh or green state) are fed into the machine over the feed-board R, whence they 85 pass over the roller B and under the rollers D D, where they are subjected to the rapid percussive or beetling action before referred to, and are at the same time being acted upon by the water from the pipe Q, are thus rapidly broken up into a mass of fibers, and the 90 stems are reduced to a soft limp condition, and then pass down to the roller G of the first pair of differential rollers, G G', and under the grip-roller H, the stream of crushed stems or fibers of which holds fast to the slower roller G, while the faster roller, G', rubs it on one side, after which action it passes down to the other pair of differential rollers, J J', where the same action takes place upon the side of 95 the stream of fibers opposite to that acted on by the rollers G G'. The wet fibers now pass 100

between two wringing rubber rollers, K K, which squeeze out the excess of gummy matter set free by the action of the water and the oscillating rollers, and are then dropped onto the endless apron M, which carries them away to such other operation as may be found necessary to complete the production of a clean white fiber.

I wish it to be distinctly understood that the object and purpose of the indentations, flutes, or corrugations on the rollers B and D is not the simple purpose of decortication, for the nearer the approach to a uniform or even plain surface the better would be the operation, were it not that if perfectly plain and even the fiber would buckle up and get into an entangled mass, which the indentations, flutes, or corrugations prevent, as they serve to preserve the parallelism of the fibers during the combined action of water and the reciprocating or oscillating rollers on the periphery of the revolving drum.

The better to distinguish the form of my corrugations or flutes, I call attention to Fig. 3, which represents a portion of the roller B, and shows that my corrugations or flutes should not be considered in the light of gearing-teeth, but rather of a series of faces arranged tangentially to the cylinder and slightly rounded at the top and bottom, which form of corrugations is not adapted for gearing purposes, but simply to present as large a surface as possible for the percussive or beetling action above referred to.

I deem the flat tangential faces an important feature of my invention, for there is less of a rolling motion and more of a direct blow with tangential faces than when the faces are round or curved, as has heretofore been proposed.

It is of course evident that one roller D may be used in place of the two rollers shown; but I prefer to use two.

I have shown an arrangement of gearing for giving the various parts the desired relative speed, but do not intend to limit myself to the gearing shown, although I consider it a very good arrangement for the purpose. All the gearing for the rollers is shown on the front of the machine except two wheels on the second pair of differential rubbing-rollers, which are on the opposite side, and these, to prevent confusion, I have shown in dotted lines in Fig. 2.

The arrangement of gearing shown consists of a spur-wheel, 5, on the shaft of the drum B, which meshes with an idler, 6, that turns a spur-wheel, 7, on roller G, that meshes with a smaller wheel, 8, on roller G', so that the roller G' turns faster than roller G. Spur-wheel 7 also meshes with a wheel, 9, on one end of a roller, J', which roller has on its other end a spur-wheel, 10, (see Fig. 2,) that

meshes with a smaller spur-wheel, 11, (shown in dotted lines in Fig. 2,) on roller J, thereby giving said roller a faster motion than that of roller J'. On the front end of the shaft of roller J is a spur-wheel set behind wheel 9 and meshing with an idler, 12, thus driving the lower roller K, which in turn drives the upper roller K by friction. The spur-wheel 13 drives an idler, 14, which meshes with a spur-wheel, 15, that drives the roller N that carries the apron M.

I deem it important that there shall be a counter-balance, R, on the lower end of the frame C, as without this it is practically impossible to give the necessary rapid action to produce the beetling or percussive effect requisite to accomplish the desired result.

Having thus shown one way of carrying out my improvement, what I claim as new is—

1. The combination, with a revolving drum having a series of flat tangential faces across its periphery, of a roller having corresponding faces, mechanism, substantially as described, for giving reciprocating motion to said roller, and a water-supply pipe, substantially as described.

2. The combination, with a rotary beetling device, as the rollers B D, of rollers running at different speeds arranged to act on the fibers as they leave the beetling device, and means for giving said rollers a differential speed, substantially as described.

3. The combination, with a rotary beetling device, as the rollers B D, of two sets of differential speed-rollers, one set having the faster roller arranged to act on one side of the stream of fibers and the other set having its faster roller arranged to act on the opposite side of the stream, and means for giving said rollers a differential speed, substantially as described.

4. The combination, with a rotary beetling device, as the rollers B D, of a pair of rollers running at different speeds, and means for giving said rollers a differential speed, and a grip-roller arranged to press on the slower roller to hold the material for the action of the faster roller, substantially as described.

5. The combination, with the roller B and reciprocating rollers D, of the differential speed-rollers G G' and J J', the grip-rollers H I, rubber wringing-rollers K K, and means for giving all of said rollers the motion described, all constructed and arranged substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses, this 28th day of January, 1888.

ROBERT H. COLLYER.

Witnesses:

GEO. G. MCLEAN,
JOHN J. BARNETT.