

(No Model.)

3 Sheets—Sheet 1.

D. E. RADCLYFFE & T. BURROWS.
MACHINE FOR PREPARING FIBER.

No. 571,173.

Patented Nov. 10, 1896.

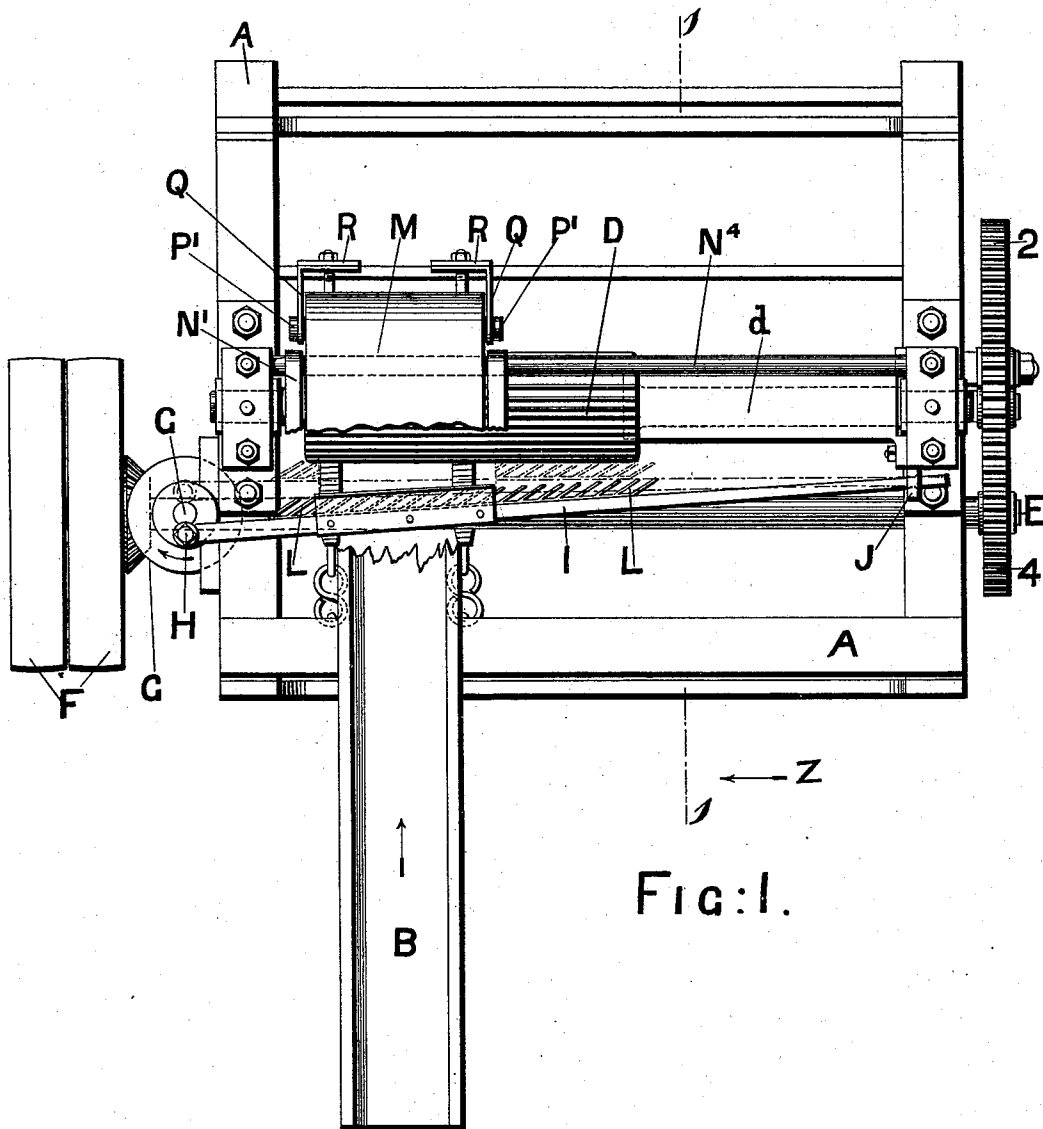


FIG: 1.

WITNESSES:
George W. Jaeger
Chas. East

INVENTORS
Dick Edward Radclyffe
and Taylor Burrows
BY *George W. Jaeger*
ATTORNEYS.

(No Model.)

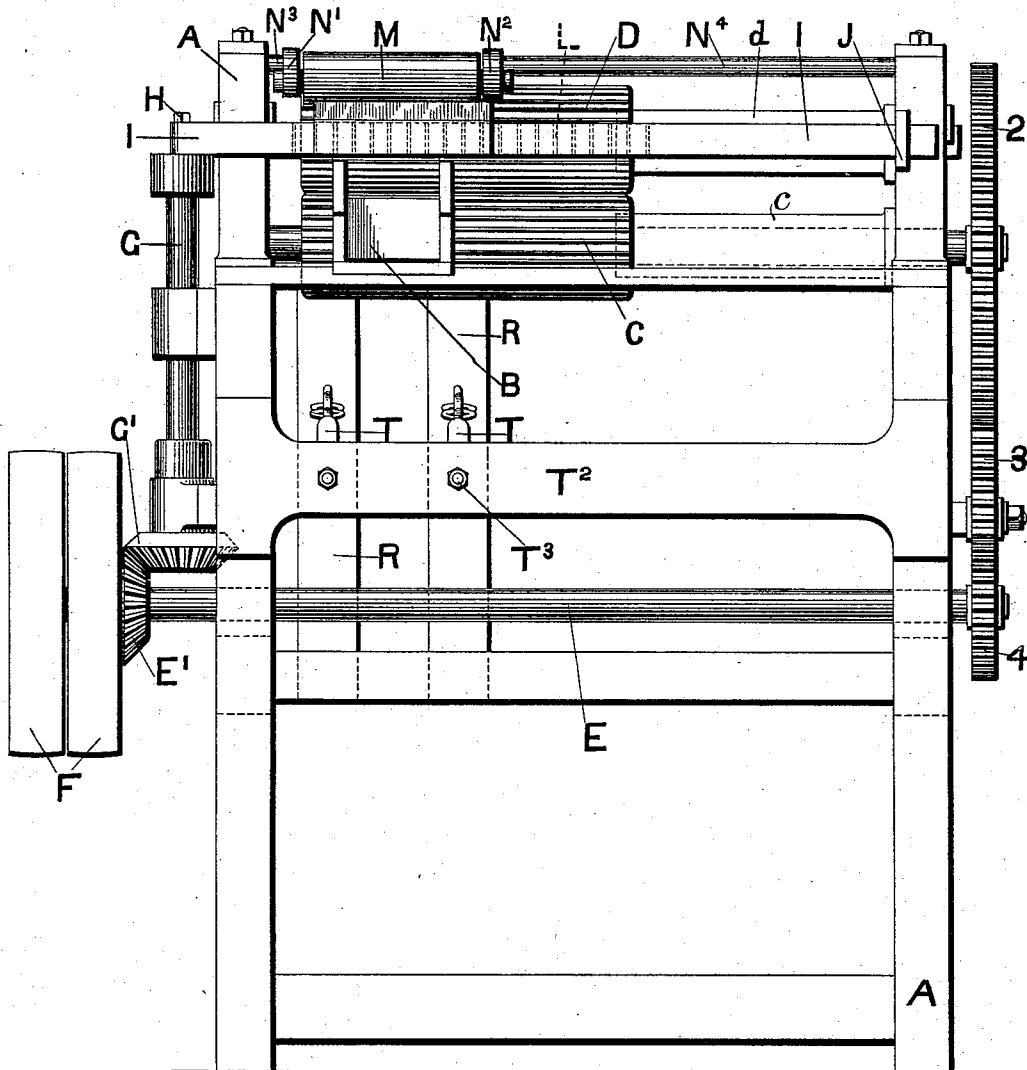
3 Sheets—Sheet 2.

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FIG. 2.



WITNESSES:
George W. J. J. J.
O. H. J. J.

INVENTORS
Dick Edward Radclyffe and
Taylor Burrows
BY *George W. J. J. J.*
ATTORNEYS.

(No Model.)

3 Sheets—Sheet 3.

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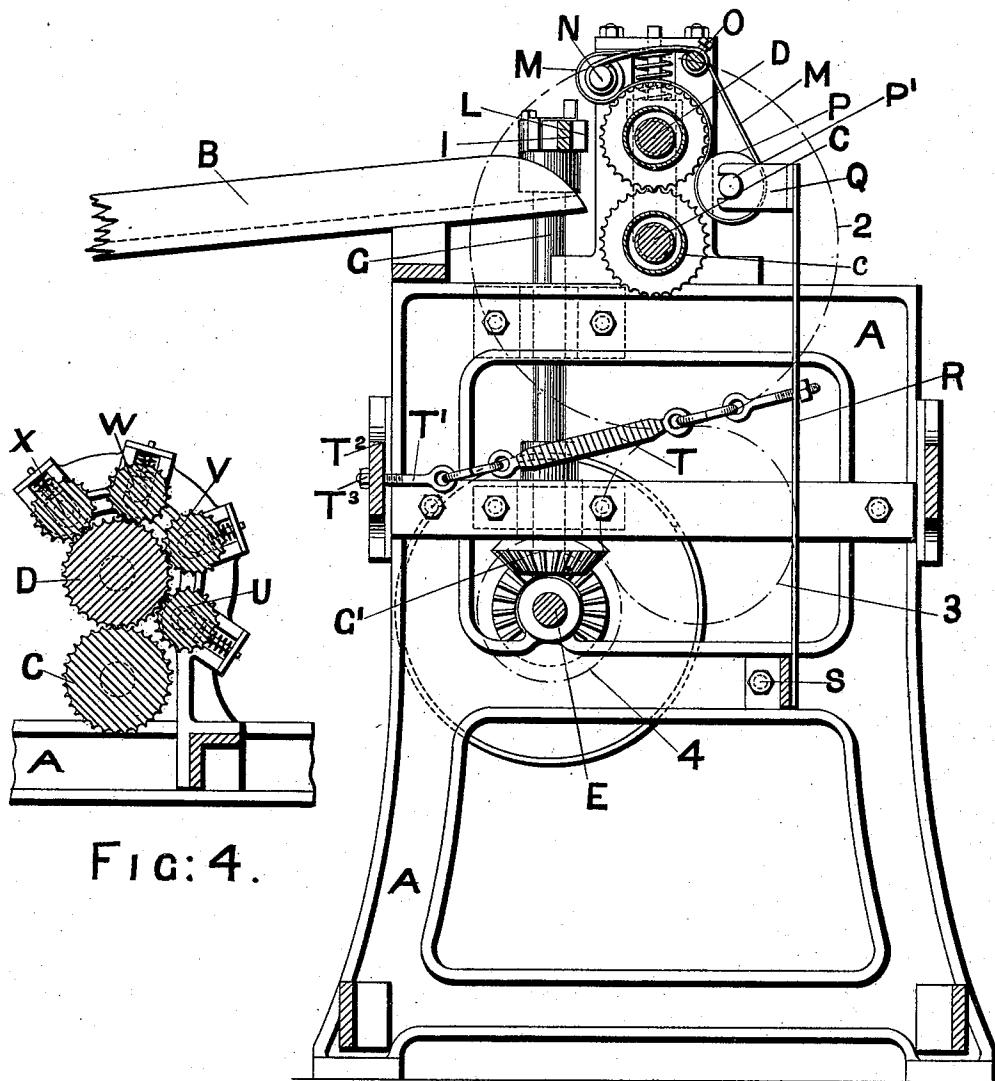


FIG: 4.

FIG: 3.

WITNESSES:
George W. Jackson
Chas. Gast

INVENTORS
Dick Edward Radclyffe
and Taylor Burrows.
BY *George W. Jackson*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

DICK EDWARDS RADCLYFFE AND TAYLOR BURROWS, OF LONDON,
ENGLAND.

MACHINE FOR PREPARING FIBER.

SPECIFICATION forming part of Letters Patent No. 571,173, dated November 10, 1896.

Application filed July 1, 1895. Serial No. 554,541. (No model.)

To all whom it may concern:

Be it known that we, DICK EDWARDS RADCLYFFE, gentleman, of 56 Gloucester Crescent, Regents Park, and TAYLOR BURROWS, engineer, of 88 Upper Kennington Lane, London, England, subjects of the Queen of Great Britain and Ireland, have invented apparatus for mechanically softening or preparing fiber, such as china-grass, rhea hemp or jute ready for opening, drawing, or other subsequent operation thereon, of which the following is a specification.

Various modes have hitherto been adopted for softening or preparing fiber, such as the "filasse" of china-grass, rhea hemp, jute, flax, &c., ready for drawing, opening, heckling, or other subsequent operations thereon, a very usual plan having been to pass the fiber through a series of rollers, (often as many as twelve or twenty pairs of rollers in one machine and sometimes varying in their character,) which press heavily against one another in order to impart a softening action on the fiber passed between same, or in some machines by an advance and return motion, (the advance being more than the return,) by which means the same amount of crushing action on the fiber can be obtained with fewer pairs of rollers, and other machinery has been tried to soften and prepare the ultimate fiber or fibrous material that has been dried after bleaching and dyeing, &c.

Now according to our present invention we produce a comparatively small and inexpensive machine which is designed for the purpose of mechanically softening fiber either in the form of filasse of china-grass or with the pellicle on, as rhea or scutched hemp or flax-stems or jute in the state in which same is usually imported either before or after ungumming and bleaching (and if before ungumming this machine will remove in the form of dust or powder a large portion if not all of the pellicle and dried gum and soften the fiber ready for ungumming and bleaching) ready for drawing, opening, heckling, or other desired operation thereon in preparing such fibers ready for combing and spinning, &c.

Our present invention comprises, essentially, two fluted rollers, mounted in any suitable frame, one or both of such rollers being

of reduced diameter for part of the length thereof between the bearings, or conical, or both, (or one roller may be shorter than the other,) means to cause the fiber fed in between said rollers to lap around only one of them and hold same lapped thereon, and a pushing device operating in the direction of the length of said rollers to push said fiber (while still lapped on said roller) lengthwise along said roller until it passes clear of that part of the two said rollers where same is crushed between said rollers—i. e., until said fiber is no longer gripped or held between said rollers—and the fiber, which has thus been subjected to a continuous varying crushing and rubbing action, can then be removed from the machine in a now thoroughly crushed and softened state.

The various novel features of this invention will be fully described hereinafter, and finally pointed out in the claims, this machine having many great advantages in use.

Referring to the drawings hereunto annexed, Figure 1 is a plan, and Fig. 2 is a front view in elevation, of a machine according to our present invention. Fig. 3 is a cross-sectional elevation on line 1 1, Fig. 1, looking in the direction of the arrow z. Fig. 4 is a local sectional detail view showing a slight modification.

Similar letters and figures of reference indicate corresponding parts throughout.

A is the standard or frame of any suitable construction.

B is a feed-trough, the inner end of which extends close up to where the two main rollers C and D meet.

C and D are the two crushing-rolls journaled in the frame A, the deep flutes of which intergear with one another, the lower roll C having the large toothed wheel, such as 2, fixed on the end of the shaft or axle thereof and caused to quickly revolve by gearing with the toothed wheel, such as 3, the latter gearing with the small toothed wheel 4, fixed on the main shaft E, revolved from any suitable source of power, such as a belt, on the fast and loose pulleys F.

G is a vertical shaft adapted to be slowly revolved, for instance, by a bevel gear-wheel G', fixed to the lower end thereof, gearing with

a bevel gear-wheel E', fixed on the main driving-shaft E. On the upper end of this vertical shaft G same carries a crank-pin H, which thereby constantly revolves and acts as a crank to impart reciprocating movement to the "pusher-off."

The pushing-off device consists of the bar or rod I, which at one end is connected (journaled) to said crank-pin H and at the other end passes through a sleeve or guiding-eye J, fixed to the stand A.

L L are blades, scrapers, or projections arranged and mounted on the side of the rod I, facing the said crushing-rolls C D.

In the machine illustrated the roll D is of two separate diameters—that is, the largest diameter where the roll is deeply fluted at D and a smaller diameter, such as at *d*, where same is not fluted; and similarly the other roll C is or may be made to correspond, as desired—*i. e.*, either with or without a plain part *c* of smaller diameter.

M is an endless apron or sheet of suitable flexible material (advantageously india-rubber or leather) which passes round the upper guide-roller N, (the latter journaled in bearing N' and N², respectively, formed or mounted on the rigid arms or supports N³ and N⁴, carried on the main frame A,) then around the loose guide-roll O, similarly mounted to the roll N, thence round the lower guide-roll P, and then bears against the fluted roll D, around which it passes (and which it encircles for about half-way round its circumference, or more or less, according to the position at which the rolls N and P are mounted) up to the aforesaid roll N. The lower guide-roll P is carried in spring-mounted bearings. For instance, the projecting ends P' of said roll P may be mounted in open forked bearings, such as the brackets or side cheeks Q, carried on the independent rocking arms R, pivoted at S to the main frame A.

T are strong springs, one end of each of which is adjustably fixed to the frame A by the bolt T' passing through the plate T² and having a nut T³ screwed thereon, so that by tightening up or slackening said nut greater or less tension is put on said spring T. The other end of each said springs T is similarly or otherwise connected to one of the rocking arms R, and by this means the roll P, carried in the two brackets or cheeks Q, is kept firmly pressed against the fluted roller D, while the two brackets Q are carried on separate arms R with separate springs to each, therefore this permits one end of the roll P to be pushed back away from the roller D, while the other end of the roll P remains firmly pressed against the fluted roller D.

The roller D is carried in spring-mounted bearings in the frame A, so that it is firmly pressed against the lower roll C, but permits the fiber to be introduced between the two said rollers C and D.

Referring now to Fig. 4, instead of using the endless sheet or apron M, as aforesaid, we may use a number of small fluted rollers, such as U V X Y, all carried in spring-mounted bearings, so as to "give" when pressed back by the fiber passing between same and the roller D or when the latter itself rises, the object of these rollers being the same as the endless sheet M—*viz.*, to guide the fiber as it emerges from between the rollers C and D, and cause same to pass around over the top of the roller D, and so pass again between C and D, and thus completely lap same around said roller D.

The operation is as follows: The fiber to be treated is laid in the feed-trough B, and the end led in between the rollers C and D, on which latter it is lapped around, and thus passes again and again between the rollers C and D, and while being thus continually crushed the pusher-bar I has the aforesaid endwise motion imparted thereto and the projections L thereon rapidly beat and intermittently push the lapped fiber along the roller D in the direction of the length of the latter until such fiber passes from between the fluted parts D and C and now rests lapped loosely around the small part *d*, from which latter it can be easily removed while the rollers C and D continuously revolve, *i. e.*, without stopping the machine, more fiber being meantime fed into the machine and the crushing and softening thereof commenced, and so on.

It will thus be seen that this machine is of a very simple and inexpensive character, while capable of rapidly treating a very large quantity of fiber in a very effective manner, the essential feature of the present invention being the means for lapping the fiber around one of the crushing rollers and keeping it so lapped while the said crushing rollers continuously revolve in combination and acting in conjunction with means to beat said fiber while thus lapped and push same along said roller in the direction of the length of the latter until it passes clear of the crushing action between said rollers, and can then be removed from the roller on which it is lapped, and thus we obtain a very rapid and beneficial action on the fiber, as and for the purposes described.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In apparatus for mechanically softening or preparing fiber of the character and in the condition described, the combination of a pair of rollers constructed between its journals for a portion of its length with active working faces consisting of flutes or corrugations, and at the other portion of its length between its journals with a non-active or smooth face, means for revolving said rollers, and means for feeding the fibers along in the direction of the length of the said rollers, substantially as set forth.

2. In apparatus for mechanically softening

or preparing fiber of the character and in the condition described, the combination of a pair of fluted rollers, constructed at one part thereof with active working faces to crush the fiber between them and at another part thereof with non-active faces, means for revolving said rollers, means for causing the lapping of the fiber on one of the rollers, and means for beating and gradually pushing said fiber along in the direction of the length of the roller on which it is lapped until it is clear of the crushing action of the said pair of revolving rollers, substantially as set forth.

3. In apparatus for mechanically softening or preparing fiber of the character and in the condition described, the combination of a pair of crushing-rollers, means for causing the fiber to lap and to remain lapped around one of said rollers while being crushed between the rollers, and means for heating and gradually pushing said fiber in the direction of the length of the roller on which it is lapped until it is clear of the crushing action of the rollers, substantially as set forth.

4. In apparatus for mechanically softening or preparing fiber of the character and in the condition described, the combination of a roller having between its journals one part thereof fluted and of larger diameter than the other part, a second fluted roller adapted to intermesh with the fluted part of the first-named roller, means for revolving said rollers, and means for feeding the fibers along in the direction of the length of the said rollers, substantially as set forth.

5. In apparatus for mechanically softening or preparing fiber of the character and in the condition described, the combination of a pair of crushing-rollers, means for revolving the rollers, means for causing the lapping of the fiber on one of the rollers as the same is fed in between the rollers, and a reciprocating push-off bar or rod arranged adjacent to the rollers, substantially as set forth.

6. In apparatus for mechanically softening or preparing fiber of the character and in the condition described, the combination of a pair of crushing-rollers, means for revolving said rollers, an endless belt arranged to cooperate with one of said rollers for lapping the fiber around and keeping it lapped around said roller, and means for beating and gradually pushing the fiber along in the direction of the length of the roller on which it is lapped, until it arrives at a point where no crushing action takes place, substantially as set forth.

7. In apparatus for mechanically softening or preparing fiber of the character and in the condition described, the combination of a pair of crushing-rollers, means for revolving said rollers, a spring-mounted endless belt cooperating with one of said rollers, and a reciprocating push-off bar or rod arranged adjacent to the roller on which the fiber is adapted to be lapped, substantially as set forth.

DICK EDWARDS RADCLYFFE.
TAYLOR BURROWS.

Witnesses:

FRANCIS W. FRIGOUT,
H. BIRKBECK.