

(No Model.)

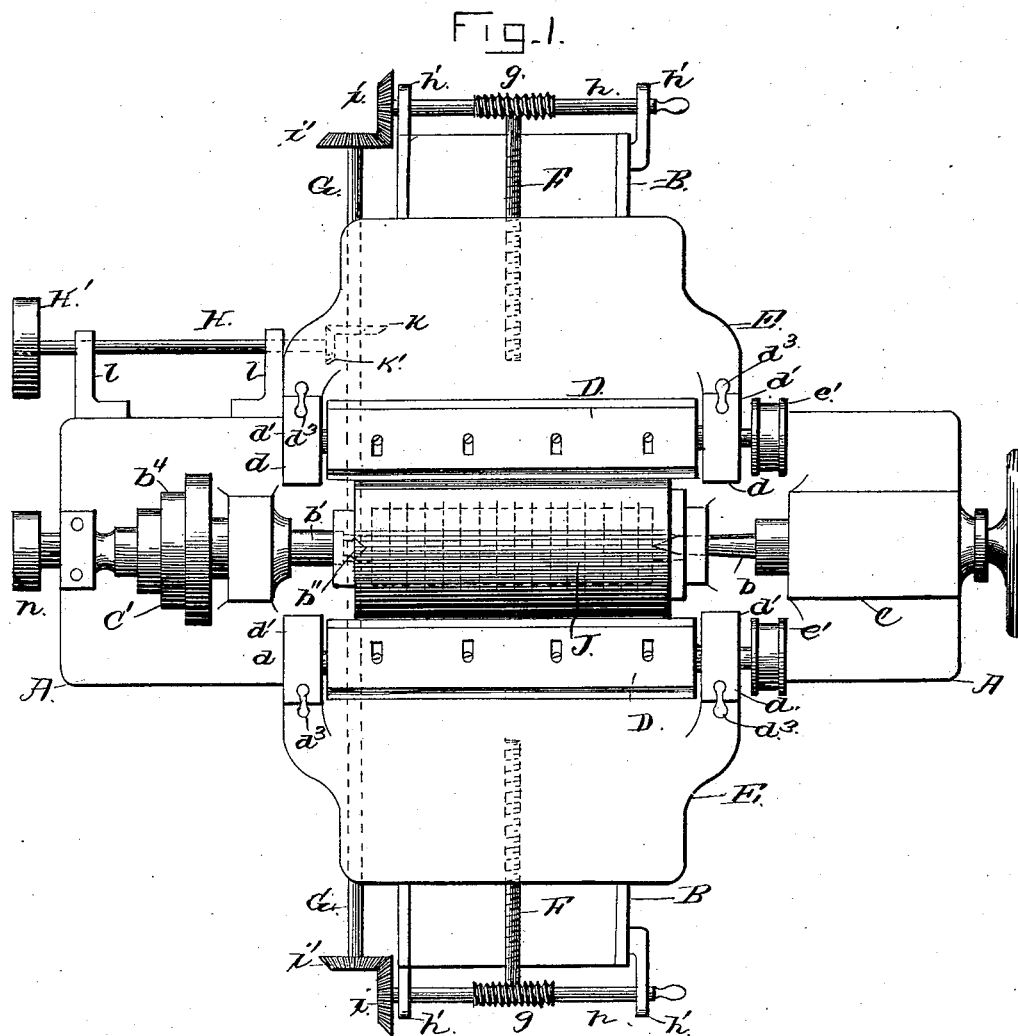
2 Sheets—Sheet 1.

S. S. WEBBER.

MACHINE FOR REDUCING LOGS TO PAPER STOCK, &c.

No. 306,979.

Patented Oct. 21, 1884.



WITNESSES:

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MACHINE FOR REDUCING LOGS TO PAPER-STOCK, &c.

SPECIFICATION forming part of Letters Patent No. 306,979, dated October 21, 1884.

Application filed May 14, 1884. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. WEBBER, of Lawrence, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Machines for Reducing Logs to Stock; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention has relation to improvements in machines for reducing logs of wood of various sizes to fiber, chips, or shavings, for the manufacture of paper-pulp or for other purposes; and the object of these improvements is to obtain from the surface of the log a product of any desired uniform length and size by a minimum expenditure of power and in a more expeditious and effective manner. The novelty therein consists in the employment of a pair of cutters arranged to revolve in opposite directions and to act simultaneously at opposite points upon the surface of the log its entire length; in means for automatically and continuously adjusting said cutters toward the center of the log, in order that it may be reduced in diameter as the cutters remove the stock; in a series of circular cross-cut knives arranged upon a mandrel parallel with and intermediate the rotary cutters, and of a number sufficient to divide or cut the surface of the log its entire length simultaneously in one revolution; in means adapting said knives to a self-adjusting positive yet yielding contact with the surface of the log; and in other details of construction and arrangement of these and several other operative elements of the machine, all as more fully hereinafter described, and pointed out in the claims.

For a better understanding of the details of construction, arrangement, and operation of my improved machine, attention is invited to the accompanying drawings, in which—

Figure 1 illustrates in plan view a machine constructed in accordance with my invention; Fig. 2, an end elevation of the same, and Fig. 3 views in detail of the series of circular cross-cut knives and their mandrel.

Like letters of reference denote corresponding parts throughout the several views.

The frame of the machine is open at its center, and consists, preferably, of four bed-plates

or extensions, A A and B B, supported by suitable feet or standards, *a a*.

The log from which the product is obtained is supported above the open center of the frame by a lathe of the usual construction, mounted upon the bed-plates or extensions A A, and consisting of the tail-stock C, carrying the adjusting screw-spindle *b*, and the head-stock C', carrying the live-spindle *b'*, with a chuck, *b''*, upon its end. The log is held between these spindles *b* and *b'*, and is rotated by a belt, *b³*, coming from any suitable driving-power and passing around the cone-pulley *b⁴* on the live-spindle *b'*. The cone-pulley is a necessary element in this lathe, as it permits of changes in the speed of rotation of the log relative to the desired width of the product; but ordinarily the log is rotated at a slow rate of speed.

D D denote the two rotary cutters, which are mounted upon carriages arranged upon the bed-plates or extensions B B at right angles to the lathe which supports and rotates the log intermediate said cutters. These cutters are arranged to act simultaneously at opposite points upon the surface of the log, and each consists, essentially, of four or more steel blades of uniform length equal to that of a shaft or cutter-block, *c*, to which said blades are secured, preferably, in a way that they may be readily removed and substituted by others. These shafts or cutter-blocks with their blades have end bearings in journal-boxes *d d*, located on the upper corners of the carriages E E. These journal-boxes each have a hinged cap, *d'*, suitably adapted at its free end to fit over a screw-threaded bolt, *d²*, and by applying a hand-nut, *d³*, the caps are secured, and by removing said nuts the journal-boxes may be opened and the cutters removed and substituted by others; or, if dull, they may be sharpened and quickly returned to their bearings. The cutters rotate and act upon the log in opposite directions at a very rapid rate of speed, and this rotation is obtained through the medium of belts *e e*, which pass around pulleys *e'*, mounted upon one end of the shafts of the cutters and communicate with any suitable driving-power.

The carriages E E, which support the rotary cutters, travel over the surface of the bed-plates or extensions B B upon tracks *f f*, and

are fed forward toward each other and toward the log by the screw-shafts FF. These screw-shafts pass one through the base of each carriage and engage at their outer ends with worm-screws *g g*, which are secured upon shafts *h h*, each arranged parallel with the outer edges of the bed-plates or extensions B B, and supported in suitable brackets, *h' h'*, secured to the same. The shafts *h h* each have on one end a bevel-pinion, *i*, and are operated simultaneously by bevel-pinions *i' i'*, provided on the ends of a shaft, G, which is arranged parallel with the bed-plates or extensions B B, and at a right angle to the shafts *h h*. This shaft G passes through and is supported by the bed-plate or extension A, supporting the head-stock of the lathe, and at a point near one of its ends is provided with a bevel-pinion, *k*, which meshes with a similar pinion, *k'*, mounted on the inner end of a shaft, H. This shaft H is arranged parallel with the bed-plate or extension A, supporting the head-stock of the lathe, and is mounted in brackets *l l*, secured to one side of said bed-plate or extension A. Upon the outer end of this shaft is provided a large driving-pulley, H', which by means of a belt, *m*, communicates with and is rotated by a pulley, *n*, on the outer end of the live-spindle of the lathe. The motion imparted to the lathe is transmitted through the medium of the gearing just described to the carriages B B, and together with the rotating cutters they are fed simultaneously and continuously toward the center of the log, thus reducing its diameter as the cutters remove the stock from its surface.

Upon the inner opposite walls of the bed-plates or extensions A A are formed vertical guideways *o o*, in which uprights I I are arranged to have vertical movement. These uprights support at their upper ends the ends of a mandrel, J, which carries a series of thin circular knives, *p p*, of a number sufficient to divide or cut the surface of the log its entire length simultaneously in one revolution. This mandrel, with its knives, is arranged parallel with and beneath the log intermediate the two rotary cutters, and said knives cross-cut or act upon the surface of the log at right angles to the cut or action of the rotary cutters, and maintain a positive yet yielding contact with the surface of the log as it is being reduced in diameter. This contact is effected by a weight, K, attached to a rope, *r*, which encircles a drum, K', having end bearings in the inner walls of the bed-plates or extensions A A, and carrying end pinions, *s s*, which mesh with a rack, *s'*, cut upon one edge of each upright I. This weight is heavy enough to give a continuous vertical adjustment to the uprights I I and enough pressure to force the sharp edges of the circular knives *p p* into the surface of the log, which, revolving and driving the knives by frictional contact, causes its surface to be cut into bands or strips, which are removed as fast as formed by the rotary cutters.

The adjustment of the spaces between the

circular cross-cut knives to obtain a product of a desired length is effected by means of collars *p' p'*, placed upon the mandrel J between the knives, and in the event of a change desired in the length of the product these collars are substituted by others of a width relative to this change of length. The collars and the knives are clamped together upon their mandrel by means of a nut, *t*, which fits over a thread cut upon said mandrel, as shown.

The machine as thus completed may be increased in a metal hood to confine the product cut from the log, and by an exhaust-fan or other well-known means this product may be drawn or conveyed to a convenient place of deposit.

It will be understood from the description given of my machine that its principal essential elements are a pair of rotary cutters acting simultaneously at opposite points upon the surface of the log, and having a continuous automatic feed toward the same, and a series of circular cross-cut knives having a self-adjusting positive yet yielding contact with the surface of the log; and it is evident that a variety of mechanical equivalents may be substituted for the construction and arrangement which I prefer, and have described, without a departure from the gist of the invention. It will also be observed that in my machine the only manual labor and only attention required is simply that of mounting the log and seeing that the driving-power is cut off before it is too late to prevent collision of the cutters.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine of substantially the character described, the combination, with devices for supporting and rotating a log of wood, of a pair of rotary cutters arranged to revolve in opposite directions and to act simultaneously at opposite points upon the surface of said log, substantially as and for the purpose set forth.

2. In a machine of substantially the character described, the combination, with devices for supporting and rotating a log of wood, of a pair of rotary cutters arranged to act simultaneously at opposite points upon the surface of said log, and mounted in hinged bearings on a pair of carriages arranged upon the bed of the machine, substantially as described.

3. In a machine of substantially the character described, the combination, with devices for supporting and rotating a log of wood, and carriages supporting a pair of rotary cutters, of intermediate gearing, whereby said carriages and cutters are fed simultaneously and continuously toward the log, substantially as described.

4. In a machine of substantially the character described, the combination, with devices for supporting and rotating a log of wood, of a series of circular cross-cut knives having a self-adjusting positive yet yielding contact with the surface of said log, substantially as and for the purpose set forth.

5. In a machine of substantially the character described, the combination, with devices for supporting and rotating a log of wood, of a pair of rotary cutters and a series of circular knives arranged to cut the surface of the log its entire length at right angles to the cut of the rotary cutter, substantially as and for the purpose set forth.

6. In a machine of substantially the character described, the combination, with devices for supporting and rotating a log of wood, of a pair of rotary cutters having a continuous automatic feed toward said log at opposite points, and a series of circular cross-cut knives arranged parallel with and intermediate said cutters, and having a self-adjusting contact with the surface of the log, substantially as described.

7. In a machine of substantially the character described, a mandrel carrying a series of circular knives, in combination with intermediate collars, substantially as and for the purpose set forth.

8. In a machine of substantially the character described, a mandrel carrying a series of circular cross-cut knives mounted in uprights, having a continuous vertical adjustment by means of a drum, cord, and weight, and intermediate connected gearing, substantially as described.

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

SAMUEL S. WEBBER.

Witnesses:

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GEORGE B. UPHAM.