

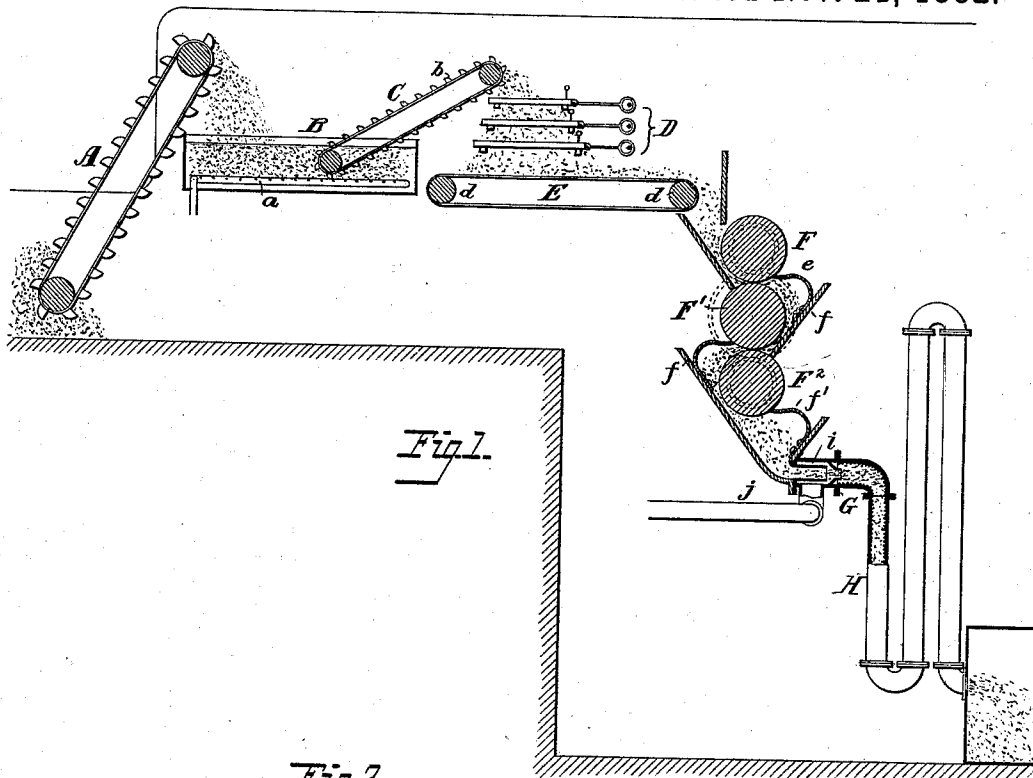
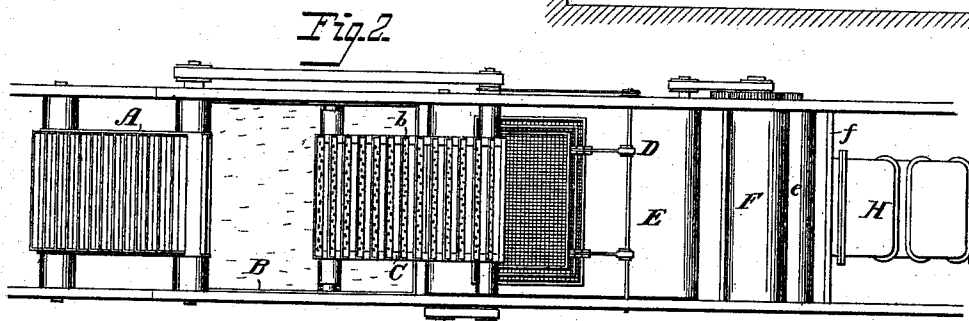
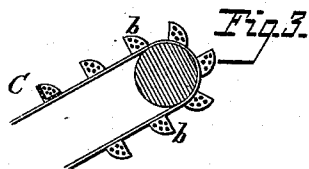
(No Model.)

G. H. POND.

COMMUNTING WOOD PULP, &c.

No. 267,715.

Patented Nov. 21, 1882.



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UNITED STATES PATENT OFFICE.

GOLDSBURY H. POND, OF NEW YORK, N. Y.

COMMINUTING WOOD PULP, &c.

SPECIFICATION forming part of Letters Patent No. 267,715, dated November 21, 1882.

Application filed April 24, 1882. (No model.)

To all whom it may concern :

Be it known that I, GOLDSBURY H. POND, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Comminuting Wood Pulp and other Substances, of which the following is a specification.

My invention consists of improvements, fully described hereinafter, whereby particles of wood or other material may be quickly and cheaply broken, crushed, and their fibers effectually separated with the use of simple appliances and the expenditure of but little power.

In the drawings, Figure 1 is a sectional elevation of sufficient of an apparatus to illustrate my improvements. Fig. 2 is a plan view, and Fig. 3 a detached and enlarged view of one of the conveyers.

A is an elevator of any suitable construction, whereby sawdust or other comminuted material is carried from any suitable receptacle and discharged into a tank, B, containing water or alkaline solution, which is heated by a furnace or by a steam-coil, *a*, as shown.

C is a conveyer, by which the comminuted matter, softened and deprived of its gum and juices by boiling, is carried above and deposited in one of a series of sieves, D. The buckets *b* of the conveyer C are perforated, so that the liquor dropped from the comminuted material as it is carried from the tank B will be deposited in the upper sieve in a comparatively dry state. The sieves are agitated by any suitable appliances, so that the particles of the material are separated and distributed prior to falling upon an endless apron, E, which passes around rolls *d*.

Instead of an apron, a chute or other conveyer may be employed for conducting the particles of material between two rollers, F F', which revolve with their surfaces in close proximity, and are so geared together by gears of different diameter or otherwise that one will revolve somewhat faster than the other, so that the material passing between them is subjected to both a pressing and a tearing action, whereby the particles are spread and opened and the fibers are loosened.

A scraper, *e*, detaches the particles that may adhere to the upper rolls, which particles fall

upon a chute, *f*, by which they are conveyed between the roll F' and a third roll, F'', which is revolved somewhat faster than the roll F', with a similar effect upon the fibers, which are removed from the roll F'' by the scraper *f'*. Four or more rollers may be employed, and in some instances two may be found sufficient. From the roller F'' the particles pass to a tube, *i*, of an injector, G, in which steam or other fluid under pressure is admitted by a pipe, *j*, so that the particles will be discharged violently and rapidly from the injector against a series of obstructions, whereby they are spread, broken, and the fibers thoroughly separated.

Different devices may be employed for presenting such obstructions in the passage of the current carrying the particles. For instance, a case or tube containing cross-bars may be used, or a stream may be thrown against a rasp-like or roughened surface. I prefer, however, to use a tube, H, bent or coiled, substantially as shown, and having its inner surfaces corrugated or roughened. The current carrying the particles rapidly over this roughened surface brings them violently in contact with the projecting ribs or points, and the latter separate and divide the particles, which are finally expelled from the end of the tube in the desired isolated condition.

Although I have described an injector and prefer to use the same, it will be apparent that in some instances an exhaust may be employed.

By the combined operations of compressing and tearing by means of rolls and disintegrating by violent contact with the obstructions, I am enabled to secure a better division of the particles with greater rapidity and with less injury to the fibers than results from the ordinary process of dividing the latter.

It will be apparent that the above-described process and apparatus may be effectively employed in the breaking up or comminuting of various other substances than those described.

For the purpose described the rolls F should have smooth surfaces; but they may be roughened when circumstances admit it, and a reciprocating longitudinal motion may be imparted to one or more of the rolls, to increase the tearing effect as well as to avoid the grooving of the surface.

It will be apparent that the disintegration

of the material by carrying it by a rapid current of steam or other fluid violently in contact with stationary objects or obstructions may be effectively used where the preliminary loosening of the fibers is effected by the means of grindstones or appliances other than those described.

I claim—

1. The mode described of comminuting particles of wood or other substances, the same consisting in introducing said particles into a rapid current of steam or other fluid, and directing said current and particles against a series of obstructions, substantially as set forth.

2. The improvement in comminuting wood pulp and other substances, consisting in first pressing the same between rollers revolving in proximity at different speeds, and then throwing the particles violently by a stream of air or other fluid against stationary obstructions, substantially as set forth.

3. The combination, in a comminuting-machine, of appliances for bringing together a blast of air or other fluid and the particles to

be disintegrated, and the tube or casing having roughened inner surfaces, substantially as set forth.

4. The combination, with a tank, B, of a conveyer, E, and the series D of sieves for distributing the material upon the conveyer, substantially as specified.

5. The combination of the tank B, sieves D, and conveyer provided with perforated buckets, as described.

6. The combination of the tank B and conveyers and two or more rolls, and means for revolving the same at different speeds, substantially as set forth.

7. The combination of the rolls, injector, and pipe having roughened inner surfaces, for the purpose described.

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

GOLDSBURY H. POND.

Witnesses:

CHARLES E. FOSTER,
A. E. T. HANSMANN,
JNO. W. SIMS.