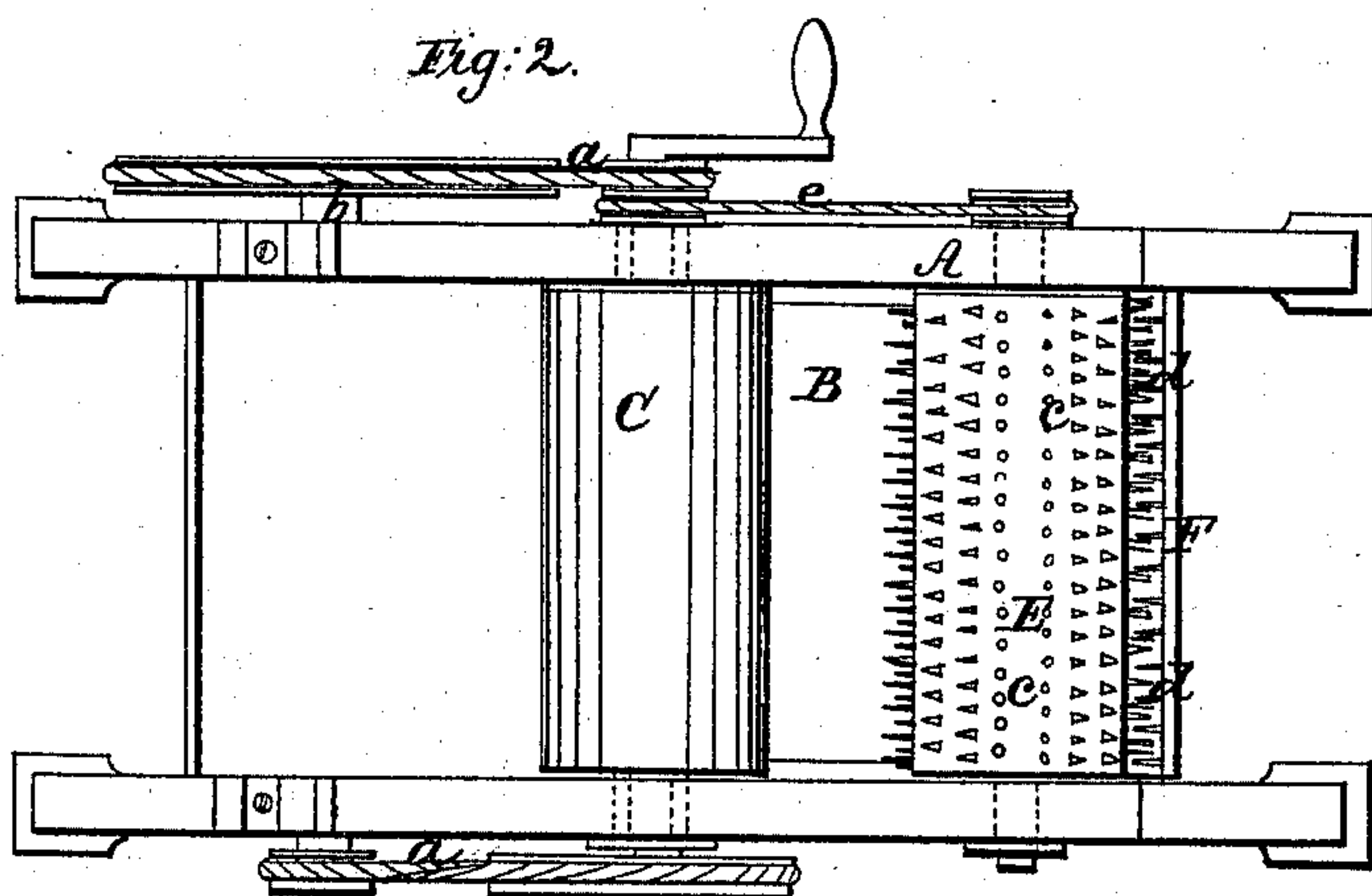
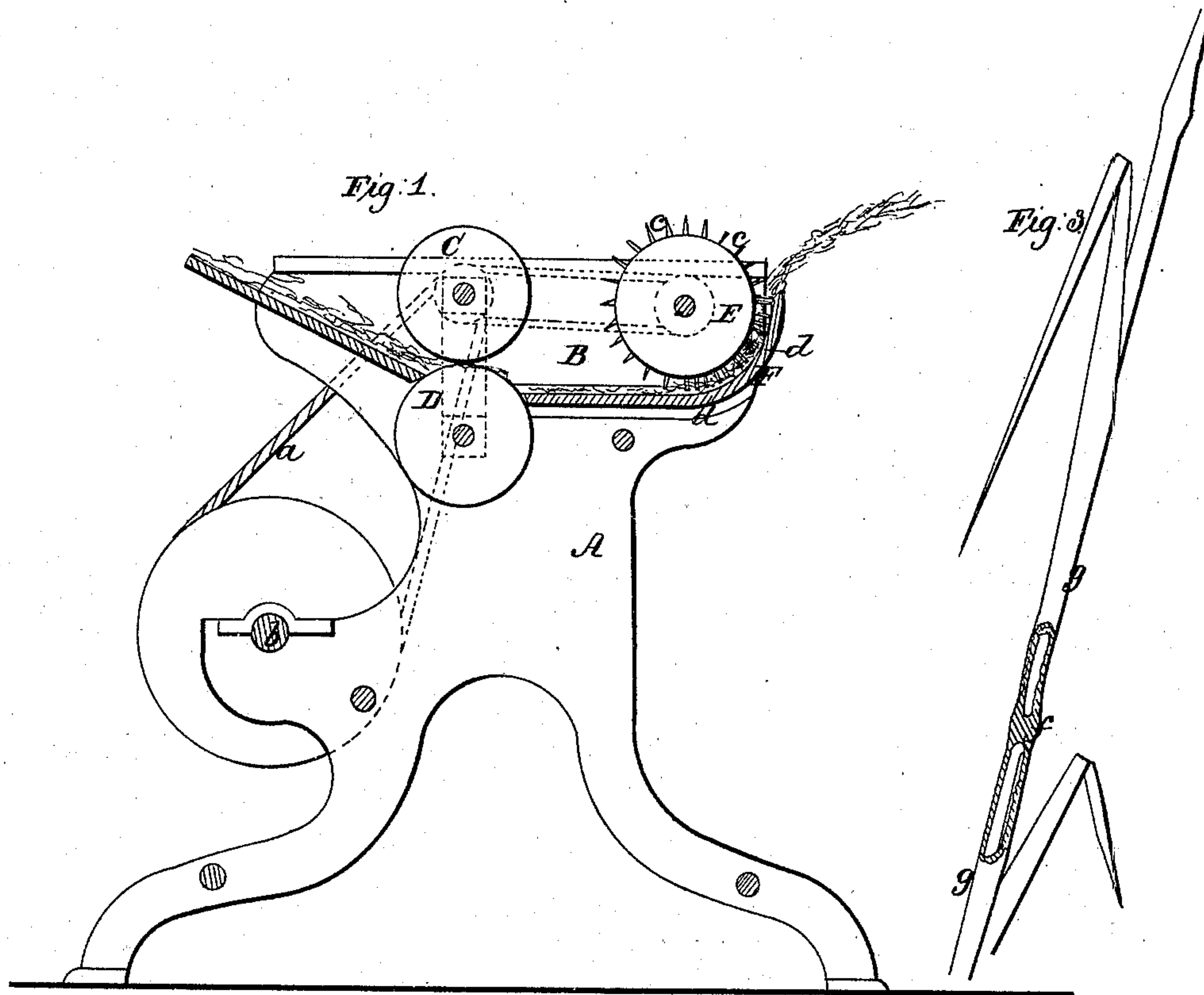


A. RANDEL.  
PREPARING PAPER STOCK.

No. 32,203.

Patented Apr. 30, 1861.



Witnesses:  
C. H. Compton,  
J. H. Compton

Inventor:  
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# UNITED STATES PATENT OFFICE.

A. RANDEL, OF NEW YORK, N. Y.

## PREPARING PAPER-STOCK.

Specification of Letters Patent No. 32,203, dated April 30, 1861.

*To all whom it may concern:*

Be it known that I, A. RANDEL, of No. 470 Third avenue, in the city, county, and State of New York, have invented a new and useful Improvement in Preparing Paper-Stock from Straw and Similar Substances; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a side sectional view of my invention; Fig. 2, a plan or top view of the same; Fig. 3, a view of a straw, drawn to show clearly the object of the invention; Fig. 4, a view of a portion of the prepared or shredded straw.

Similar letters of reference indicate corresponding parts in the several figures.

In preparing straw and other similar vegetable fibrous substances for paper-stock, the straw or other substance is cut into pieces of suitable length, bleached and then reduced to a pulp by a suitable machine or engine. Straw and other similar vegetable substances contain besides a fibrous substance a hard matter which is a great detriment to the stock as it is reduced to a powder and in the preparing of the stock is diffused through the pulp and gives the paper a speckled appearance.

The object of the within described invention is to obviate this difficulty by separating the hard worthless portion from the useful fibrous part before the stock is submitted to the bleaching process. For this purpose I employ a machine in which two pressing rollers and a shredding device are combined. The pressing rollers move at different velocities.

The straw or other fibrous substance, in its natural state, is fed in between the two pressing rollers by which the knotty or worthless parts are crushed; and also by the action of the differential velocities of the rollers the fibers of the stock are in part separated. The rollers deliver the stock to the shredder, which consists of a spiked cylinder and spiked concave—and by these parts the stock is further separated into finer fibers and delivered from the machine ready for bleaching.

To enable those skilled in the art to fully

understand and construct my invention, I will proceed to describe it.

A represents a framing which may be constructed in any proper way to support the working parts of the machine, and B is a box or hopper on the upper part of the framing.

C, D are two rollers which are placed in the framing A, the roller C being in the hopper and the roller D projecting upward through the bottom of the box or hopper as shown in Fig. 1. The rollers C, D, are placed one over the other in the same axial plane and they both rotate in the same direction but with different speeds, the upper roller C having a quicker motion than the lower one D, the latter being rotated from the former by belts *a a* and a shaft *b'*, see Fig. 2.

E is a roller which is placed in the box B, near its discharge end. This roller is provided with teeth *c* at its periphery, which as the roller rotates work or pass between the teeth *d* of a concave F, concentric with the roller E. The roller E may be rotated direct from the roller C by a band *e*, the rollers C, E, having about the same speed.

The operation of the machine is as follows: Suppose for instance that straw is the material to be used for forming the paper stock. Straw contains the hard or solid substance at its joints as shown at *f*, in Fig. 3. This is the worthless substance previously alluded to, while the parts *g*, between the joints is the fibrous useful part. The roller C is rotated by any convenient power and the straw passed between the rollers C, D, which crush the straw and reduce the solid parts *f* to a powder. This latter result is obtained by a grinding action of the rollers produced by their different speeds. The crushed straw passes from the rollers C, D between the roller E and concave F and is shredded thereby or slitted into pieces as shown in Fig. 4. The ground or comminuted parts *f* are of course allowed to escape from the straw as the latter is shredded, the shredded parts being projected out some distance from between the roller and concave, while the heavier and worthless ground parts fall directly to the ground. By this means it will be seen that the manufactured article—paper—will be rendered



free from specks, due, in the ordinary mode of preparing the stock, to the distribution of the ground worthless portion through the mass of the stock.

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

The combination of the differentially mov-

ing crushing rollers, with the shredding cylinder E and spiked concave P substantially 10 in the manner and for the purposes herein shown and described.

A. RANDEL.

Witnesses:

M. M. LIVINGSTON,

C. W. COWTAN.