(No Model.)

C. KELLNER.

MACHINE FOR REDUCING PAPER STOCK.

No. 489,079. Patented Jan. 3, 1893.

Fig. 1.

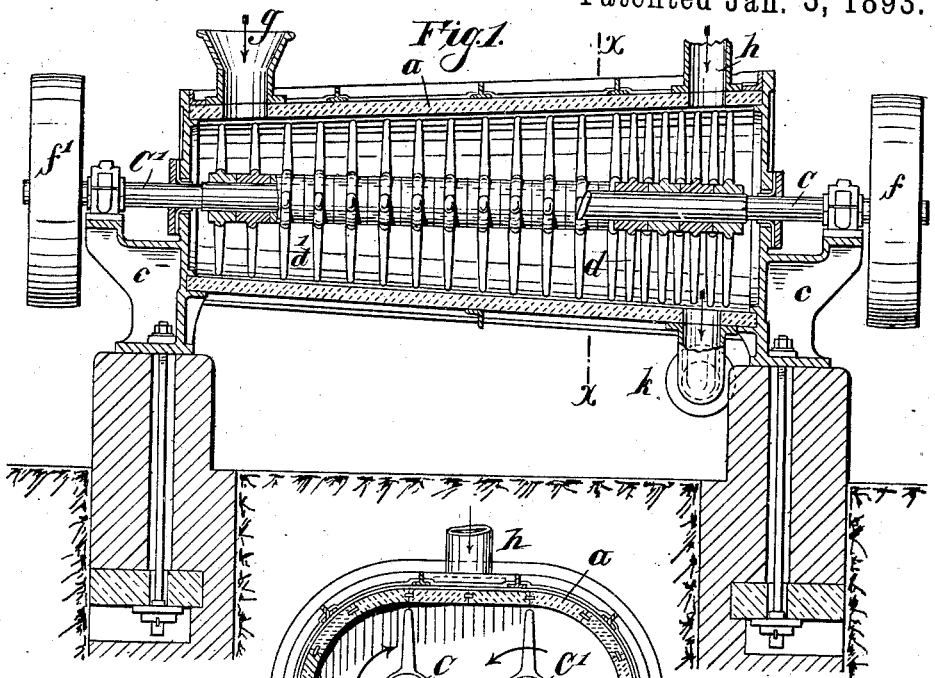


Fig. 2.

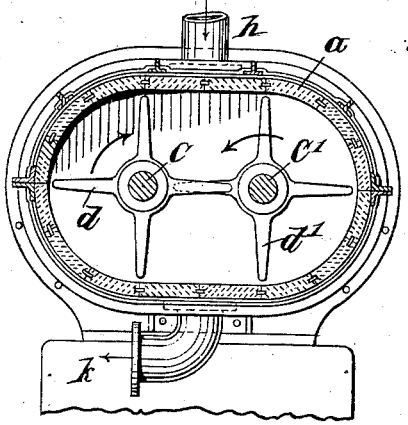
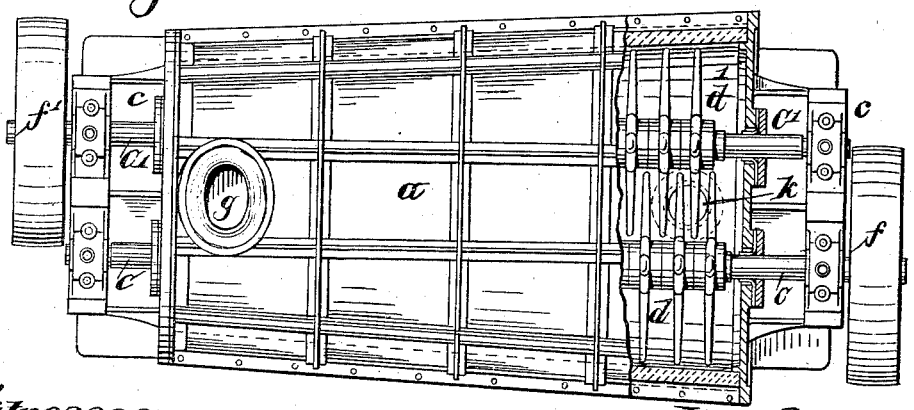


Fig. 3.



Witnesses:
H. G. Dieterich
B. N. Sommers.

Inventor.
Carl Kellner,
by Henry Orth
Atty.

UNITED STATES PATENT OFFICE.

CARL KELLNER, OF VIENNA, AUSTRIA-HUNGARY.

MACHINE FOR REDUCING PAPER-STOCK.

SPECIFICATION forming part of Letters Patent No. 489,079, dated January 3, 1893.

Application filed April 18, 1892. Serial No. 429,578. (No model.)

To all whom it may concern:

Be it known that I, CARL KELLNER, a subject of the Emperor of Austria-Hungary, residing at Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Apparatus for Preparing Wood and other Fibers for the Manufacture of Paper; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has relation to apparatus for preparing fibrous materials, such as wood or other fibrous materials, for the manufacture of paper.

The apparatuses or machines heretofore employed in the preparation of fibrous materials for the manufacture of paper, such as the well known rag engine or stuff cylinders or engines present structural defects that seriously affect the product or pulp; not only is the separation of the fibers from one another not as complete as may be desired, but the fibers are more or less torn, while in the case of wood fiber the hard resinous bodies such as knots that remain unaffected by the disintegrating liquors, are ground up sufficiently fine to pass with the cellulose through the strainers and tend to materially impair the purity as well as the color of the pulp.

The object of this invention is to obviate these disadvantages by the provision of means whereby the separation of the individual fibers from one another is more effectually attained, and whereby the grinding up or disintegration of the knots or hard resinous bodies mixed with the cellulose is avoided, the product after leaving the machine being like cotton and very easily felted.

To these ends the invention consists in the construction and arrangement of the operative mechanism, as will now be fully described, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional elevation; Fig. 2, a transverse section on line *x*—*x* of Fig. 1, and Fig. 3, a sectional top plan view of a machine of the class described, embodying my invention; like letters of reference being employed to indicate like parts wherever such may occur.

In the above drawings, *a*, indicates the separator shell of a more or less ellipsoidal form in cross section, the sides of the ellipse being flattened so as to cause the ends of the beater arms or blades to revolve in close proximity to the inner surfaces of the shell, which is made tapering, its cross sectional area being gradually reduced from the discharge to the feed end.

The separator shell is supported on suitable end standards, *c*, *c*, in which are formed the bearings for two shafts, *b*, and *b'*, armed with beaters or blades, *d*, and *d'*, respectively, four such beater arms being preferably formed on a bearing or sleeve mounted on the shafts. The beaters or blades, *d*, are so arranged on shaft, *b*, as to work between the teeth or blades, *d'*, on shaft, *b'*; but not in contact with each other, sufficient space being left between them to allow the knots or hard resinous bodies to pass without being ground up. The beaters or blades *d d'* are made longer as they approach the discharge end of the shell so as to conform to the cross-sectional area thereof; and as the material, being treated, nears the discharge and the fibers become more and more separated from one another, I increase the number of beaters or blades on the shafts (as shown in Fig. 1) to complete the separation and to thoroughly mix the fibrous material with the water fed into the cylinder, at said discharge end and to facilitate and expedite the discharge of the fibrous material.

The shafts are revolved toward each other either by suitable gearing, or as shown, by means of a driving pulley, *f*, *f'*, respectively, mounted on the opposite outer ends of said shafts, *b*, and *b'*. By reason of the more or less conical form of the separator shell, *a*, its inner lower face or bottom inclines more or less from the feed to the discharge end, whereby the material is automatically caused to move toward or to said discharge end irrespective of the pressure exerted by the material fed to the separator through feed hopper, *g*.

In order to further facilitate the discharge of the material from the separator shell I pro-

vide a pipe, *h*, at the discharge end through which water is introduced into the shell so as to thin out the fibrous material and cause it to readily flow through the discharge pipe, *k*, Fig. 1.

In practice the cellulose is fed to the separator in the form of a thick semi-dry paste, the water having been first drained off, and the two shafts are rapidly revolved in opposite directions, the beaters acting on the fibers to effectually separate the same from one another and from the knots or hard resinous bodies, while the latter pass freely between the beater arms without being crushed or ground up, so that they can be readily removed by straining the pulp in the usual manner after leaving the machine.

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

In a machine of the class described, the combination with the shell or casing made to taper from the discharge to the feed end and provided at the latter end with a feed hopper and at the discharge end with a water supply pipe N, and a discharge pipe *k* arranged diametrically opposite each other, of the shafts Z and Z′ each provided with sets of beater arms increasing in length and number toward said discharge end, the beater arms on one shaft working between those on the other shaft, and means for revolving said shafts toward each other, substantially as and for the purpose set forth.

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

CARL KELLNER.

Witnesses:

JULIUS GOLDSCHMIDT,

A. SCHLESSING.