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APPARATUS FOR MANUFACTURING PULP

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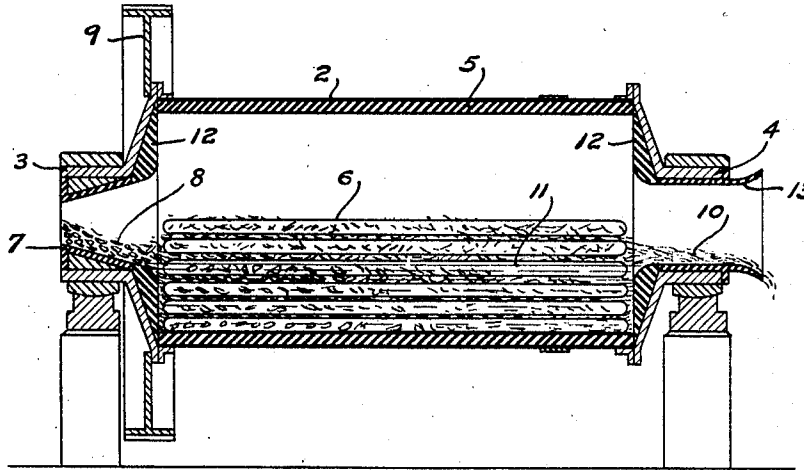


FIG. 1.

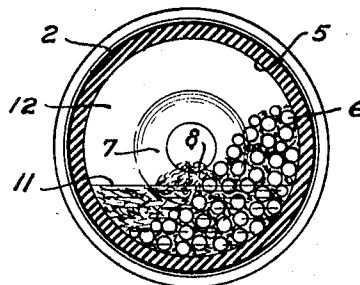


FIG. 2.

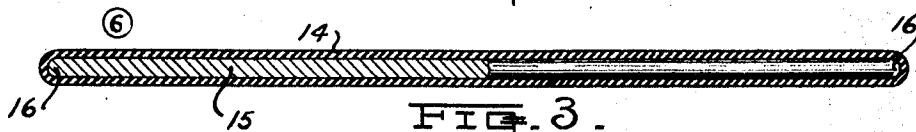


FIG. 3.



FIG. 4.

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APPARATUS FOR MANUFACTURING PULP.

Application filed August 21, 1925. Serial No. 51,542.

This invention relates in general to improvements in the art of converting fibrous materials into pulp, and relates more specifically to improvements in the construction and operation of rotary drum mills and freely tumbling or rolling disintegrating bodies therefor for segregating the fibers of materials such as wood, cane or the like, in order to prepare such fibers for use in the manufacture of paper or similar material.

A general object of the invention is to provide an improved drum mill and freely tumbling disintegrating bodies cooperable therewith, which will resist chemical action and which will more effectively perform their function than has heretofore been possible with similar devices.

In accordance with the disclosure in application Serial No. 49,455, filed August 10, 1925, by Bruce W. Rogers, it has heretofore been proposed to manufacture paper pulp from wood, by first reducing the wood to chips of relatively small size, by subsequently softening the chips with the aid of chemicals, and by finally reducing the softened chips to pulp in a drum mill having freely tumbling metal disintegrating rods therein, the mill being operated at relatively low speed. While the chemicals are desirable in order to effectively soften the chips and enable disintegration thereof by squeezing and rubbing, the particular chemicals necessarily employed, are of such a nature that they attack metallic rods and linings and cause corrosion and oxidation which results in the formation of undesirable coloring matter in the pulp. This coloring matter discolors the pulp and permits its use for only certain lower grades of paper.

Because of the fact that the softened chips are disintegrated by virtue of a squeezing and rubbing action as distinguished from impact, it is found that hard surfaced disintegrating bodies are not essential. The present invention contemplates surfacing or coating the disintegrating bodies with rubber or other material capable of resisting oxidation or corrosion thereof. As it has previously been suggested to utilize rubber covered linings for rod and ball mills, the use of rubber coated rods in accordance with the present invention, in a rubber lined mill, would obviously entirely eliminate objectionable chemical action tending to dis-

color the pulp. The rubber coated rods constructed in accordance with the present invention would moreover resist wear to a greater extent than is possible with metallic disintegrating bodies, and would thereby prolong the life of the mill. These and other objects of the present improvement will be apparent from the following description.

A clear conception of an embodiment of the present invention and of the operation of devices constructed in accordance therewith, may be had by referring to the drawing accompanying and forming a part of this specification in which like reference characters designate the same or similar parts in the various views.

Fig. 1 is a longitudinal vertical section through a rod mill loaded with a charge of rubber coated rods and pulp stock.

Fig. 2 is a transverse vertical section through the rod mill and the charge therein.

Fig. 3 is an elevation of a fragment of one of the improved rubber coated disintegrating rods.

Fig. 4 is a transverse section through one of the improved rubber coated disintegrating rods.

The disintegrating mill specifically illustrated in the drawing comprises in general a cylindrical drum or shell 2 having end heads and supporting trunnions 3, 4. The mill is rotatable by means of a gear 9 associated with one of the end heads and is internally protected by liners 5 preferably coated with rubber or other abrasion and erosion resisting material. The end heads of the mill are also protected by liners 12 likewise preferably covered with rubber or the like. The feed trunnion 3 may also be provided with a rubber covered liner 7 and the discharge trunnion 4 may likewise be provided with a rubber covered liner 13, thus covering the entire interior of the mill with a rubber coating. Located within the drum mill is a plurality of freely tumbling disintegrating rods 6 which extend substantially throughout the length of the disintegrating chamber.

As specifically illustrated in Figs. 3 and 4 each rod 6 may be formed of a relatively heavy metal core 15 provided with a rubber coating 14. The ends 16 of the cores 15 may be rounded as shown in Fig. 3 and like-

wise coated with rubber. With the mill charged with such rubber coated rods 6, no metal surfaces are exposed to the material passing through the mill.

5 When utilizing the mill to disintegrate wood chips, the chips 8 are preliminarily treated in order to soften the same after which they are admitted to the rotating drum mill within which the rods 6 are cas-
10 cading, tumbling and rolling over each other due to the rotation of the mill. The chips 8 are admitted with liquid 11 and due to their relatively soft condition, are subjected to a squeezing and rubbing action between
15 the cascading rolling rods 6 whereby the fibers are effectively separated without undesirably breaking or otherwise damaging the same. As the chips 8 advance through the disintegrating chamber and toward the
20 discharge trunnion 4, the segregated fibers 10 are eventually discharged through the trunnion liner 13 and are ready for subsequent utilization in the manufacture of paper pulp.

25 It will thus be noted that by surfacing or coating the interior of the mill and the disintegrating bodies therein, with rubber or other material capable of resisting oxidation and erosion, discoloration of the fibers
30 is avoided. Due to the fact that the separation of the fibers is effected by the squeezing and rubbing action rather than by impact, the rubber coatings are relatively effective in producing separation of the fibers
35 even while the mill is being operated very slowly. The use of rubber with its wear-resisting qualities, also prolongs the life of the mill to a maximum and the rubber may be readily applied to the rods and to metallic
40 liner plates, by vulcanizing or otherwise. The liners 5, 12 are preferably made section-

al in order to permit ready installation and removal thereof.

It should be understood that it is not desired to limit the invention to exact details 45 of construction and operation herein shown and described for various modifications within the scope of the claims may occur to persons skilled in the art.

It is claimed and desired to secure by Letters Patent:

1. In combination, a rotary drum mill, and freely tumbling or rolling disintegrating bodies therein having resilient coatings.

2. In combination, a rotary drum mill and a plurality of freely tumbling rubber coated disintegrating bodies within said mill. 55

3. In combination, a rotary drum mill and a plurality of freely tumbling disintegrating rods within said mill each of said rods being completely coated with rubber. 60

4. In combination, a rotary rubber lined drum mill, and a plurality of freely tumbling metallic disintegrating bodies within said mill, each of said bodies being completely coated with rubber. 65

5. In combination, a rotary drum mill having its entire interior lined with rubber and a plurality of freely tumbling metallic rods within said mill, each of said rods being completely coated with soft rubber. 70

6. In combination, a rotary drum mill, and a plurality of freely tumbling disintegrating bodies within said mill, both the interior of said mill and the exterior surfaces of said bodies being coated to avoid discoloring material passing through said mill. 75

In testimony whereof, the signature of the inventor is affixed hereto.

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