Sept. 3, 1946. F. W. ROBERTS 2,406,904

WOOD GRINDING MACHINE

Filed May 5, 1944

Fig. 1

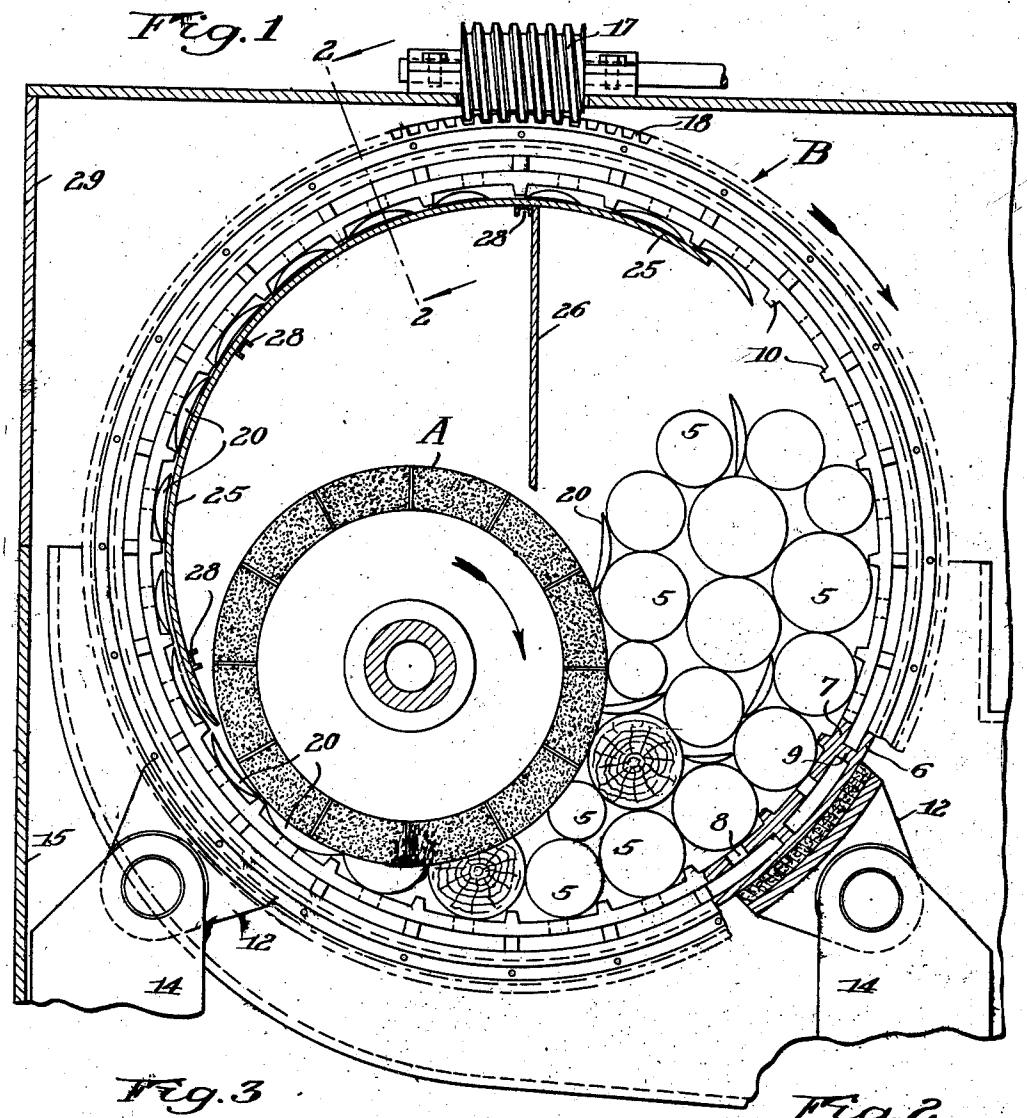


Fig. 3

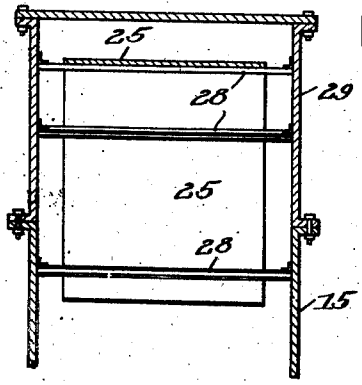
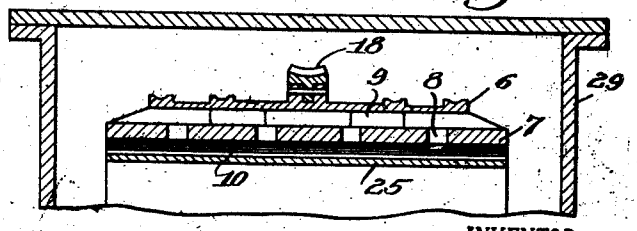


Fig. 2



INVENTOR.
Frederick W. Roberts
BY
Parker, Prichard & Palmer
his Attorneys

Patented Sept. 3, 1946

2,406,904

UNITED STATES PATENT OFFICE

2,406,904

WOOD GRINDING MACHINE

Frederick W. Roberts, Lockport, N. Y.

Application May 5, 1944, Serial No. 534,179

2 Claims. (Cl. 241—97)

1

This invention relates to improvements in machines for grinding wood to produce pulp, and more particularly to grinders of the type shown in my Patent No. 2,282,887 of May 12, 1942, in which wood is fed to the grindstone by means of a feed ring arranged eccentrically about the grindstone.

In machines of this type, the feed ring is of considerably larger diameter than the grindstone, thus forming a converging space in which the logs are pressed against the grindstone by the feed ring. At the end of this space, the grindstone and feed ring are spaced apart by a slight gap and the parts of the logs adjacent to the inner surface of the feed ring, consequently, pass through this gap without being ground.

One of the objects of this invention is to provide means of improved construction for disposing of the shims or remnants of wood or logs after they have passed through the space between the feed ring and the grindstone. Another object is to provide a grinding machine of this kind with means of improved construction for conveying the shims or thin remnants of wood, after they have passed the grindstone away from the discharge side of the grindstone.

Another object of this invention is to provide a shim conveyor which automatically carries the shims from the discharge side of the grindstone to the feed side thereof for grinding.

Other objects and advantages of this invention will appear from the following description and claims.

In the accompanying drawing:

Fig. 1 is a side elevation, partly in section, of a wood grinding machine provided with a shim conveyor embodying this invention.

Fig. 2 is a fragmentary transverse section thereof, on line 2—2, Fig. 1.

Fig. 3 is a transverse sectional elevation thereof, on a smaller scale with the grindstone and feed ring omitted.

A represents a grindstone which may be of any suitable or usual construction and which is arranged eccentrically within a feed ring B, both the grindstone and feed ring rotating in the same direction as indicated by the arrows in Fig. 1, the feed ring, however, rotating very slowly, just sufficient to feed the logs 5 of pulp wood against the face of the grindstone at the desired rate.

The feed ring B may be of any suitable construction, that shown being similar in construction to the one shown in my above mentioned patent, and includes an outer substantially imperforate cylindrical wall 6 and an inner perforate wall 7 provided with apertures or perforations 8, the two walls being preferably integrally connected at intervals by spacing and reinforcing ribs or studs 9. The space between the two annular walls is provided for the discharge of ground wood and water which enter into this annular space through the openings 8. The inner wall 7 of the feed ring is also provided with a series of inwardly extending projections 10 which may be in the form of lugs or cleats which engage the logs of wood for the purpose of forcing them under pressure into the wedge-shaped or tapering space between the feed ring and the grindstone, and thus forcing the wood into contact with the grindstone.

2

The feed ring may be mounted in any suitable bearings, such for example, as the bearing blocks 12 which may be pivotally arranged on base blocks or brackets 14, adjustably mounted on the frame 15 of the machine. The grindstone may also be journalled in suitable bearings (not shown) on the frame or housing 15, and rotation may be imparted thereto in any suitable or usual manner. The feed ring may be rotated by means of a worm 17 engaging worm teeth 18 of a worm gear which is suitably secured to the outer wall 6 of the feed ring.

In the operation of the apparatus thus far described, it will be evident that the periphery of the grindstone A is spaced to clear the inner ends of the cleats or projections 10, and consequently, during the grinding of the wood, those parts of the logs which lie adjacent to the feed ring will pass between the grindstone and the feed ring without being ground, and this invention deals mainly with the disposal of these remnants or shims 20.

For this purpose, I provide a shield or conveyor plate 25, which is preferably in the form of a plate curved to conform substantially to the interior of the inner wall 7 of the feed ring, but spaced therefrom sufficiently to clear the cleats or projections 10 and to provide a space between this ring and the plate into which the shims may enter, and in which they may be moved by the cleats of the feed ring during the rotation of the ring. The curvature of the shield is such that it is substantially coaxial with the feed ring and it is spaced from the feed ring a distance slightly greater than the space between the grindstone and the feed ring so that the shims that pass between the grindstone and the feed ring will readily enter the space between the feed ring and the shield and will be loosely held in this space by the cleats 10. The lower end of this conveyor

plate or shield preferably extends into close proximity to the grindstone A so that the shims, as soon as they are discharged from the grindstone, will enter into the space between the feed ring and the shield **25**. By means of this construction, the shims are kept clear of the discharge side of the grindstone, and consequently, if it should become necessary to reverse the direction of rotation of the feed ring, for example, for the purpose of removing logs or foreign material from the receiving end of the grindstone, the shims will not pile up one on another, and thus become wedged in the space between the feed ring and the grindstone.

The shims may be discharged from the other end of the shield **25** in any suitable manner and may be disposed of as desired. Preferably, however, I discharge the shims from the shield into the wood receiving portion of the feed ring into which the logs **5** to be ground are fed so that these shims together with fresh logs may be fed by the feed ring into grinding relation to the stone. For this purpose, I extend the shield **25** beyond the partition or wall **26** into the receiving chamber for the wood to be ground.

The shield **25** may be supported within the feed ring in any suitable or desired manner. In the construction shown for this purpose, the shield **25** is secured to a plurality of structural bars, such for example as the channels **28** shown in the drawing, and the ends of the channels may be secured to any stationary part, such as the frame or the housing **15** and to an upper housing part **29** in any suitable manner, see Fig. 3. These structural bars extend through the interior of the feed ring and beyond the same to the housing walls, to which they are so secured as to space the shield in correct relation to the feed ring. Any suitable means may be provided for securing the structural bars to the housing, and if desired, the bars may be adjustably mounted on the housing, so that as the grindstone wears away and the feed ring is raised, the shield may be adjusted accordingly.

By means of the construction herein described, it will be obvious that the shims immediately after they have passed the grindstone, will enter into the space between the shield and the inner wall of the feed ring, and the same cleats or projections **10** which feed the logs to the grindstone will also feed the shims in the space between the shield and the feed ring. These same cleats or projections, furthermore, carry the shims to the upper part of the shield from where they may be readily discharged to the stack of logs to be ground. Consequently, the cleats are preferably made with blunt edges so that the shims will not be impaled on the cleats and will readily drop from the cleats at the discharge end of the shield.

In the event that it becomes necessary to reverse the direction of rotation of the feed ring, the shims will not become wedged in the space between the grindstone and the feed ring, but will be fed one at a time to this space so that they may pass between the feed ring and the grindstone without wedging or interfering with the reverse rotation of the feed ring. The construction described also provides for the automatic discharge of the shims for re-grinding, so that no waste of wood results.

I claim as my invention:

1. In a wood grinding machine including a rapidly revolving grindstone and a feed ring arranged eccentrically about said grindstone with a portion of its inner surface in close proximity to but out of contact with said grindstone and rotatable slowly to press wood against one side of the grindstone, that improvement which comprises a shield at the other side of said grindstone and extending substantially coaxially with said feed ring and spaced therefrom to receive shims which have passed through the space between said feed ring and said grindstone, said shield extending at its receiving end into close proximity to the grindstone to receive shims immediately after they are moved out of contact with the grindstone and having its discharge end extending over the grindstone to discharge the shims at the first mentioned side of the grindstone to be again fed to the grindstone by the feed ring for regrinding, and cleats on said feed ring for engaging the wood which is fed to the grindstone and which feed the shims through the space between said feed ring and said shield.

2. In a wood grinding machine including a rapidly revolving grindstone and a feed ring arranged eccentrically about said grindstone with a portion of its inner surface in close proximity to put out of contact with said grindstone and having wood engaging projections on the inner face thereof, said feed ring being rotatable slowly to feed wood at one side of said grindstone into grinding contact with said stone, and a stationary structure within which said grindstone and feed ring are arranged, that improvement which comprises a shield at the other side of said grindstone and extending substantially coaxially within said feed ring and spaced therefrom a distance slightly greater than the thickness of wood remnants or shims to enable said shims to enter said space and to be advanced in said space, said shield extending at its receiving end into close proximity to the grindstone to receive shims immediately after they are moved out of contact with the grindstone and having its discharge end extending over the grindstone to discharge the shims at the first mentioned side of the grindstone to be again fed to the grindstone by the feed ring for regrinding, and supporting bars secured to said stationary structure and to said shield for supporting said shield in correct relation to said feed ring.

FREDERICK W. ROBERTS.