G. E. SOVEREIGN.

ATTRITION PLATE FOR LEATHER SHREDDING MILLS.

APPLICATION FILED NOV. 13, 1906.

938,798. Patented Nov. 2, 1909.

FIG. 1.

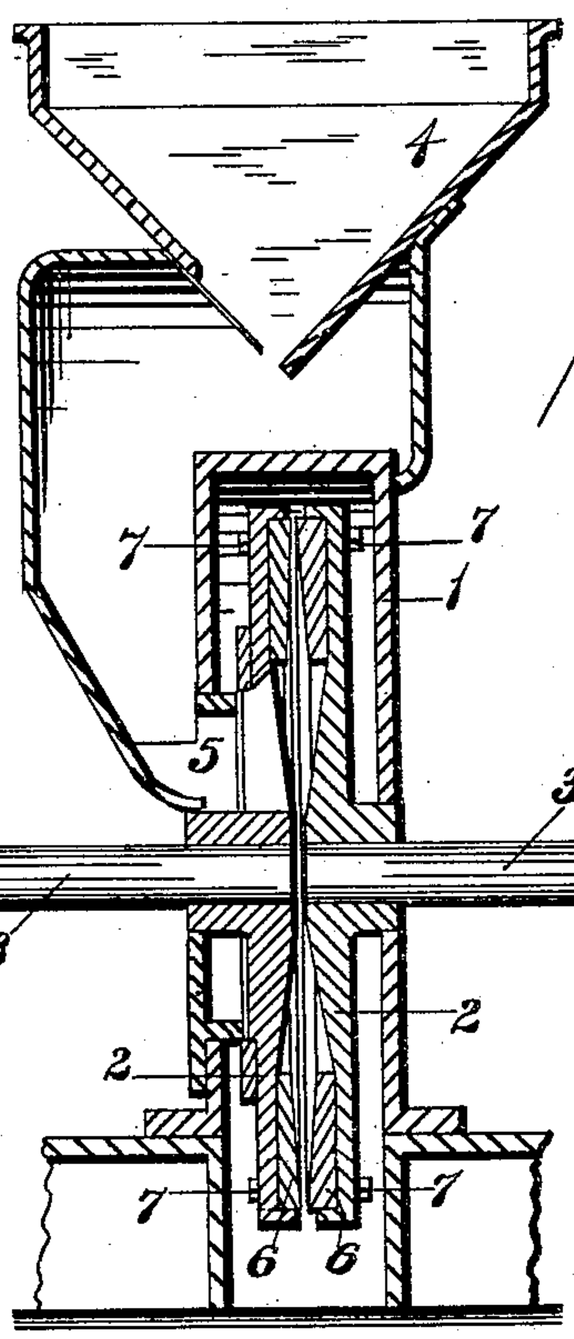
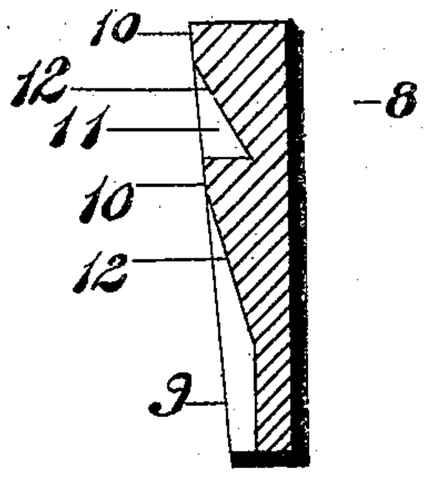


FIG. 3.



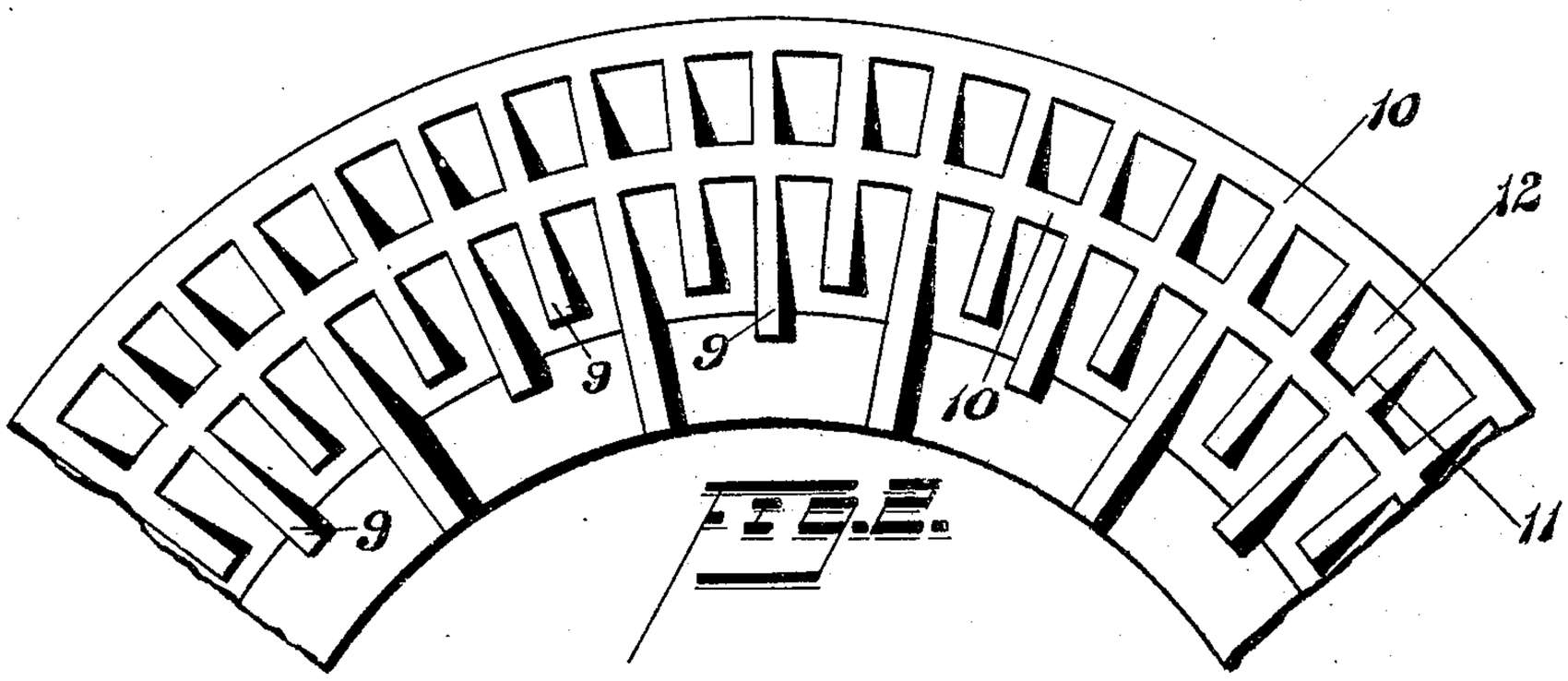


FIG. 2.

WITNESSES

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ATTRITION-PLATE FOR LEATHER-SHREDDING MILLS.

938,798. Specification of Letters Patent. **Patented Nov. 2, 1909.**

Application filed November 13, 1906. Serial No. 343,257.

To all whom it may concern:

Be it known that I, GEORGE E. SOVEREIGN, a citizen of the United States, residing at Pottersville, in the county of Hunterdon and State of New Jersey, have invented certain new and useful Improvements in Attrition-Plates for Leather-Shredding Mills, of which the following is a specification.

My invention relates to the rotary disks, or renewable face plates therefor, of reducing or attrition mills, and more particularly to the disks of mills for shredding leather, such leather shredding mills being a new type of attrition mills developed by certain advances in the art of making leather board, all as set forth in my prior patent No. 845721, issued February 26, 1907.

The objects of the present invention are to facilitate a maximum shredding of the leather and reduce to a minimum the granulation of it or production of dust and pulverized particles; to this end to provide a construction of disks which permits a ready separation of the shredding fibers from the larger pieces of leather as soon as they are sufficiently reduced during passage through the mill, whereby said sufficiently reduced shreds pass outward and escape without further attrition and pulverization which would reduce their value, if not render them useless; to prevent packing of the shredded material in the pockets of the disks, and to expedite its discharge from the mill as soon as thus shredded; to at the same time secure a perfect shredding of the leather or other material, and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings, in which like numerals of reference indicate the same parts in the several figures, Figure 1 shows a central vertical section through a reducing mill of the type in which my improved attrition plates are particularly adapted to be used; Fig. 2 shows a face view of a portion of one of the said plates, and Fig. 3 shows a transverse section through such a plate.

In said drawings, 1 designates a casing inclosing a reducing chamber within which are attrition heads or disks 2, 2, mounted on shafts 3, 3, and arranged face to face but separated by a short distance. These shafts are mounted in suitable bearings and arranged to be rotated by suitable driving means not shown, the whole arrangement being one which is common in machines of the type, as shown in my prior patent above referred to and also in my application copending herewith Serial No. 388,019, a division of the present application, and therefore does not require complete illustration or description here.

Above the casing 1 is a feed hopper 4, from which a passage 5 leads to a point adjacent to one of the disks 2 and near the center thereof, said disk having an opening opposite the end of such passage adapted to permit material discharged from said passage to fall into the space between the two disks 2, 2.

6, 6 are the removable faces or plates of said disks 2, having the form of annuli or rings, and adapted to be secured to the heads 2 by bolts 7, in the ordinary manner. Each such face plate is provided, on its front or working side, with a plurality of radial and annular ribs intersecting each other, and pockets therebetween, 9, 9 designating the said radial ribs, 10, 10 the annular ribs, and 11 the pockets.

It is to the detail features of the pockets 11 between the ribs that the present improvements more particularly relate, and a construction is obtained in this respect by which those portions of the leather or like material already shredded are facilitated in their escape or discharge from the attrition plates at whatever point thereof their shredding was completed, and are not reground and reacted upon until they are granulated or pulverized, it being remembered that the purpose of this type of mill is to shred the leather into fibers which will mat together in the formation of leather board, and that all pulverized material is waste. The said radial ribs 9 act as cutters to reduce or shred the leather or other material, and opposite cutting ribs on the two disks or reducing plates have their faces converging outwardly toward the periphery of the plates or disks, preferably on straight lines, as set forth in my prior patent above referred to. The annular ribs 10, which are the arresting ribs of the attrition plates and serve to direct the material to the cutting ribs, are also in their position on the said plates and in their relation to each other and to the cutting ribs, the same as shown in my said prior patent, being preferably each of even height with the cutting ribs at that point where it intersects them, and the series of annular

ribs thus increasing in height progressively outward as do the radial cutting ribs.

The bottoms of the pockets 11 slope or shelve outwardly on straight lines to the tops of the adjacent arresting ribs forming the outer boundaries of said pockets, as shown at 12 in Fig. 3. These inclines are shown in the outer row of pockets as extending from the bottom of the inner arresting rib to the top of the outer arresting rib, while the inner row of pockets have their bottoms sloping from the inner ends of the short radial ribs upwardly outward to the top of the first annular rib. This gives an inclined or shelving bottom for each pocket, and the effect of such shelving or sloping bottoms is to effect an elemental or primary separation of the partially shredded leather, as well as to direct the large pieces of leather against the attrition plate of the opposite disk and thus between the cutting ribs of the two plates.

The primary separation of the partially reduced leather by the shelving bottom is effected by reason of said shelving bottoms permitting the shreds and small pieces to pass along outward by the centrifugal force of the rotating disks, while the larger unshredded pieces are directed by the shelving bottoms toward the opposite attrition plate where the cutting ribs catch them. In this way I avoid re-acting upon the already shredded material and thus making it too fine or pulverizing it, which would render it unfit for any purpose whatever in making leather board, and at the same time I insure the unshredded pieces being repeatedly acted upon by themselves until properly shredded. A uniformly shredded product, remarkably free from pulverized material and dust, is thus secured.

It will be noted that the pockets are at their inner edges, or points adjacent to the outer sides of the arresting ribs, of maximum depth, whereby ample relief space is provided for the material to expand as it escapes momentarily from the cutting ribs. This relief from pressure enables the material to loosen up or relax, as such springy and fibrous material as leather especially will do, and this expansion or relaxation enables the dust and the sufficiently shredded pieces to detach or free themselves from the mass, and that partial separation above described to take place with maximum freedom. At the same time, the efficiency of the grinding action of the plates upon the pieces of leather which are too large or not sufficiently shredded, is not impaired.

Having thus described the invention, what I claim as new is:—

1. A grinding plate for shredding mills, having a plurality of radial cutting ribs, an inner annular arresting rib intersecting said radial cutting ribs intermediate of their ends, and an outer annular arresting rib also intersecting said radial cutting ribs, said arresting ribs forming radial series of pockets between the cutting ribs, the bottoms of said pockets shelving or sloping at the inner side of each annular arresting rib radially outward toward the top of said arresting rib, said arresting ribs being abrupt at their outer sides and the radial ribs being at their intersection with such abrupt outer side of the inner annular rib as high as said annular rib.

2. An attrition plate for leather shredding mills, having continuous radial cutting ribs of height increasing progressively toward the periphery of the plate, and a series of annular arresting ribs intersecting said radial cutting ribs and forming pockets therewith, the bottoms of the pockets between two adjacent annular arresting ribs shelving or sloping from the bottom of the inner arresting rib outwardly to the top of the outer one.

3. An attrition plate for leather shredding mills, having radial cutting ribs of height increasing progressively toward the periphery of the plate and a series of annular arresting ribs intersecting said radial cutting ribs and forming pockets therewith, said arresting ribs being where they intersect the cutting ribs of the same height as the latter and the bottoms of the pockets between two adjacent annular arresting ribs shelving or sloping outwardly toward the top of the outer rib.

GEORGE E. SOVEREIGN.

In the presence of—
ETHEL B. REED,
FREDERICK GERMANN, Jr.