

H. J. SHELTON.
RETAINING RING FOR PULVERIZERS.
APPLICATION FILED JULY 13, 1917.

1,322,833.

Patented Nov. 25, 1919.

Fig. 1.

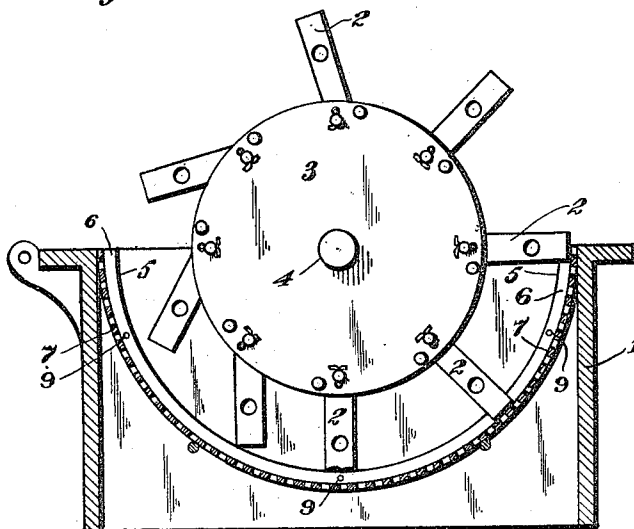
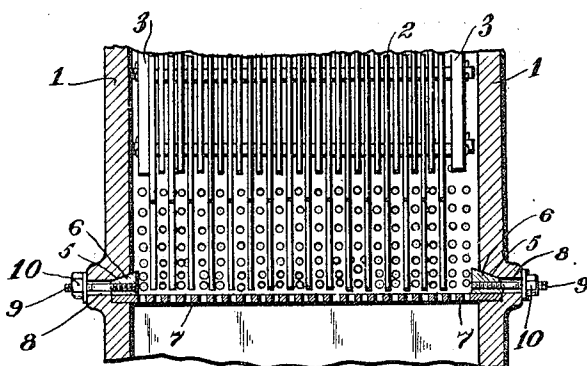


Fig. 2.



Inventor
H. J. Shelton
By
John C. Higdon Atty.

UNITED STATES PATENT OFFICE.

HENRY J. SHELTON, OF ST. LOUIS, MISSOURI.

RETAINING-RING FOR PULVERIZERS.

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Specification of Letters Patent.

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Application filed July 13, 1917. Serial No. 180,334.

To all whom it may concern:

Be it known that I, HENRY J. SHELTON, a citizen of the United States, and a resident of St. Louis, in the State of Missouri, have
5 invented certain new and useful Improvements in Retaining-Rings for Pulverizers, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying
10 drawings, forming a part hereof.

My invention relates to grinding and pulverizing machines having a housing or casing with hammers rotatably mounted therein and which have in their lower parts a grinding and screening plate through which the
15 material, after it is ground and pulverized, is made to pass. This screening plate is usually made of a single sheet of perforated metal and usually extends over the lower
20 half of the circumference of the grinding and pulverizing chamber. The thickness of the sheets used for making these screens depends, to a very large extent, upon the size of the apertures or perforations therein,
25 and it often becomes desirable or necessary to change the screening plate so as to change the degree of fineness of the material drawn from the machine. The material to be pulverized and ground is retained in the grinding chamber until it has been reduced to
30 such a degree of fineness as will permit of its passing through the orifices in the screening plate. These plates are usually held in position in the machine by means of bolts
35 or screws or other fastening devices, and the side edges of the plate are usually adapted to lie in arcuate grooves made in the inner surface of the casing or housing of the machine. These grooves are almost invariably
40 formed of a width radially which is considerably greater than the thickness of the thickest plate which is likely to be used with the machine. The result is that when a thin plate is used there is a considerable
45 clearance or space between the inner circumferential face of the screening plate and the adjacent circumferential walls of the grooves in which the edges of the plates lie. If this space is not closed or "packed" by
50 some suitable means the material being ground is likely to pass through the space around the edges of the screening plate and thus escape from the grinding chamber before it has been reduced to the degree of
55 fineness desired.

The object of my invention is to provide

in a grinding and pulverizing machine a packing ring whereby the grinding and screening plate will be firmly retained in place and the space at the edges of the plate
60 be packed to prevent the escape therethrough of material; and a further object of my invention is to provide a packing and retaining ring that will permit screening plates of different thicknesses to be used in the
65 same machine and all be firmly retained in place and their side edges packed to prevent the escape of material outside the edges thereof; and a further object of my invention is to provide a means for retaining in
70 place the grinding and screening plate of a grinding and pulverizing machine that will permit of the screening plate being quickly and easily removed and a thinner or thicker plate being quickly and easily inserted in the
75 machine.

My invention is fully shown in the accompanying drawings where the same reference numerals are used to designate similar parts.

Figure 1 is a vertical view of a grinding
80 and pulverizing machine with the upper part of the housing removed and the lower part in section; and Fig. 2 is a vertical axial section of a portion of the machine of Fig. 1.

Referring to the drawings, 1 is the housing or casing in which are mounted the rotatable hammers 2. These hammers are pivotally mounted on the disks 3 which are rigidly fastened on the rotatable shaft 4. Formed in the side walls of the casing 1
85 there are grooves 5. These grooves are semi-circular and formed with the outer circumferential wall axial and the inner circumferential wall inclined inwardly toward the center of the machine. 6 is a radially
95 movable expanding packing and clamping ring which lies in the groove 5 between the inner wall thereof and the grinding and screening plate 7 which latter lies with its side edges in the grooves 5 and with its outer
100 face contacting with the outer walls of said grooves. The rings 6 are arcuate in shape and preferably semi-circular, as shown in the drawings, and are substantially of the same length as the screening plate 7. The
105 outer circumferential face of the ring 6 is formed axial so that it will contact with the inner surface of the screening plate 7 and form there a tight joint. The inner circumferential face of the ring 6 is beveled
110 so as to contact, when in place, with the inner circumferential wall of the groove

5. The radius of the inner circumferential face of the ring 6 is not the same as the radius of the inner circumferential wall of the groove 5, although the face of the ring and the wall of the groove are cut to the same bevel or slant. In fact the inner wall of the groove 5 is a right segment of a right cone and the inner face of the ring 6 is a right segment of the same right cone, but taken closer to the vertex of the cone than is the segment which forms the inner circumferential wall of the groove 5. The result of this construction is that when the ring 6 is put in place in the groove 5 and forced outwardly in the groove the ring is made to expand *i. e.*, have its diameter increased so as to adjust itself to fill the space in the groove between the screen plate and the inner wall of the groove. Each ring is provided with a plurality of stud bolts 9 which project outwardly through holes 8 formed in the side walls of the housing 1, and each bolt is provided with a suitable washer and a nut 10. The holes 8 through which the bolts 9 project are made considerably larger than the bolts so that the bolts may adjust themselves radially in the holes as the ring 6 is made to enter to a greater or less distance in the groove 5. Because of the resilience of the ring 6, when the nuts 10 are loosened on the bolts 9 there is a tendency for the ring to contract and the inclined face of the ring acting upon the inclined inner circumferential wall of the groove 5 forces the ring inwardly and raises the outer circumferential wall of the ring from the surface of the screening plate 7. The sloping of the inner face of the ring and of the inner wall of the groove together with the resilience of the ring make the ring tend to spring out of the groove when the nuts 10 of the bolts 9 are loosened. When it is desired to remove the screening plate 7 the nuts 10 are loosened and the ring contracts and moves inwardly so as to free the side edge of the screening plate 7. Sometimes it may be necessary to start the ring by jarring it by a blow on one or more of the bolts 9 or on the side walls of the casing 1. When the ring 6 has been allowed to spring inwardly so as to free the screening plate 7, this plate may be grasped by one end and drawn out of the groove. Then another plate may be inserted by merely pushing it down in the space between the outer circumferential wall of the groove and the outer circumferential face of the ring. When the nuts 10 on the bolts 9 are tight-

ened the ring is drawn into the groove and is made to expand so as to fill the space between the inner circumferential wall of the groove and the plate 7 and thus clamp the plate 7 in place and also "pack" the groove so as to prevent the passage of material from the grinding chamber through the groove. By making the ring 6 in one piece and of substantially the same length as the plate 7 it is seen that it becomes very easy to insert a plate because the outer face of the ring and the outer wall of the groove serve as guides for the side edge of the plate 7 when the plate is being pushed into place from one end of the groove.

It is evident that the sloping of the inner face of the ring and the inner wall of the groove may be varied between wide limits without departing from the spirit of my invention, and the thickness and resilience of the ring may be made whatever may be deemed advisable or necessary.

What I claim as new and desire to secure by Letters Patent, is:

1. In a grinding and pulverizing machine having a grinding and screening plate whose side edges lie in arcuate grooves cut in said walls of the machine each of said grooves having its inner circumferential wall formed of a right section of the surface of a cone of revolution, a radially movable semicircular retaining and packing member for each of said grooves having its inner circumferential face formed of a section of the surface of the same cone as that of said wall of said groove but taken from said cone nearer the vertex thereof than is said wall of said groove.

2. A grinding and pulverizing machine comprising a semi-cylindrical grinding and screening plate, side plates, each of said side plates having a semi-circular groove adapted to receive a side edge of said grinding and screening plate, a single semi-circular radially movable clamping ring interposed between said grinding and screening plate and the inner circumferential wall of said groove, and means whereby said ring is made to expand to fit tightly between said grinding and screening plate and the inner circumferential wall of said groove.

In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

HENRY J. SHELTON.

Witnesses:

HENRY L. HIGDON,
JOHN C. HIGDON.