Sept. 18, 1934. E. D. DUMAS 1,973,922

BALL GRINDING DISK

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Fig. 1.

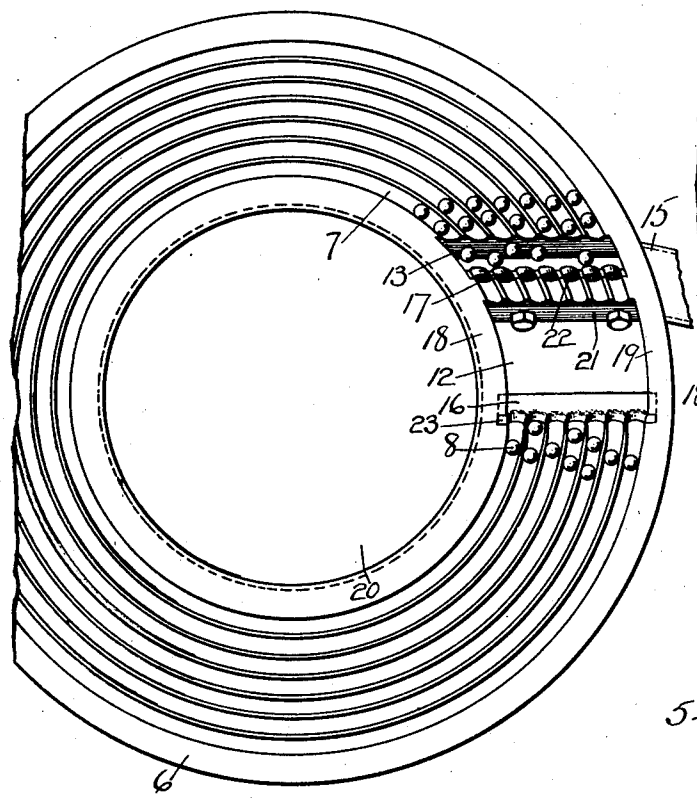
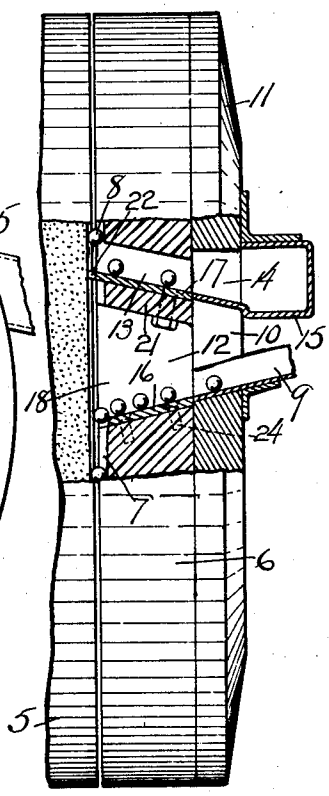


Fig. 2.



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BALL GRINDING DISK

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5 Claims. (Cl. 51—130)

My invention relates to the class of grinders more commonly employed for producing metallic articles of spherical form, and an object of my invention, among others, is the production of a grinding disk for this purpose which shall be particularly efficient in the results obtained from its use and especially one which may be readily formed and installed for use with the consumption of little time and which may be re-dressed and afterward installed in a simple and efficient manner.

One form of a grinding disk embodying my invention and in the construction and use of which the objects herein set out, as well as others, may be attained is illustrated in the accompanying drawing in which—

Figure 1 is a face view of a portion of a grinding disk embodying my invention.

Figure 2 is an edge view of said disk shown in relative position to a supporting disk and with parts cut away to show construction.

My improved grinding disk illustrated and described herein comprises a stationary disk 5 which is supported in a manner that will be readily understood by those skilled in the art, and the numeral 6 denotes a rotatable disk having grooves 7 for the reception of balls 8 which travel around the grooves to be formed into spherical shape in a manner common to structures of this type. The balls are fed from a suitable source through a trough 9 into an opening 10 extending through a cap 11 which is secured to the disk 6, and through an opening 12 formed through the disk and from which opening they travel into the grooves 7 of the disk. The disks are supported with their faces in vertical planes, and as shown in Fig. 2 of the drawing, and in passing from the grooves the balls are delivered through openings 13 and 14 in the disk and cap and into a chute 15 from which they are finally discharged, or from which they are discharged into a receptacle from which they are returned to the disks for subsequent grinding operations. All of the parts thus far described are of old and well known construction and further and detailed description is therefore omitted herein.

In the construction of prior grinding disks a radial gap of considerable width has been formed in the disk, extending from the central opening to the periphery thereof and the wear plates, stripper plates and chutes for the supply of balls to the disks and to conduct them therefrom have been affixed within this gap. In these prior structures it has been proposed to avoid the wear at the entrance ends of the grooves in the disks by attaching a wear plate at that edge of the gap at which the balls enter the grooves. This construction, however, is objectionable from the fact that when the grinding disks come from the foundry and after they have been grooved the wear plate must be fitted within the gap, and this has required several hours' time, and even days in some cases, to get the plate properly fitted and the parts adjusted thereon.

In the practice of my invention I form the openings 12 and 13 within the boundaries of the disks, thereby creating bars 18 and 19 at opposite sides of said openings, the bar 18 being located between the central opening 20 in the disk and said openings, and the bar 19 between said openings and the periphery of the disk.

A wearing plate 16 is located at the entrance side of the opening 12, this plate being secured to the disk in the process of casting the latter so that it forms an integral part of the disk with the result that when the disks are received from the foundry they are practically ready for the formation of the grooves, and the extra time, hereinbefore mentioned, heretofore required to affix the plates and properly adjust them, is not needed. The grooves are formed in the disk in the usual manner, but the plate 16 is grooved at the same operation so that the grooves or notches in the plate accurately fit the grooves in the disk.

A bridge 21 is formed between the bars 18 and 19, this bridge forming one boundary of each of the openings 12 and 13, the bridge being cast integral with the disk. A stripper plate 17 is secured to the bridge at one side of the opening 13, as by means of screw bolts, and as shown in Fig. 1 of the drawing, this stripper plate comprising projections 22 located opposite the grooves 7 in the disk and serving to intercept the balls as they pass from the grooves into the opening 13 and thereby cause the balls to pass out through the chute 15.

In the old construction hereinbefore mentioned and which employed separate wear plates, the disks were finished entirely through the central hole and also on the outer face in order to provide surfaces to receive attachments by means of which the wear plate or chutes, etc. were clamped in position. With the present structure, in which the wear plate is practically integral with the disk, this finishing is not required and only a slight thickness of the disk is finished in the center hole merely to provide means for centering the disk, and the outer edge does not require to be finished at all.

As an aid in securing the plate 16 in rigid con-

tact with the wall of the opening 12 the ends of said plates 16 are extended, as at 23, so that they project into the substance of the bars 18 and 19, the plate being so located in the mold prior to casing that the metal will flow around the ends, and as shown in Fig. 1 of the drawing; and as another means for rigidly securing the plate in place, pins 24 may be extended through the plate and into the metal comprising the disk, as shown in dotted line in Fig. 2, the metal of the disk, in the casting operation, fusing around said pins, which may be headed, thereby serving to additionally support the plate and secure it in place.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the device which I now consider to represent the best embodiment thereof; but I desire to have it understood that the device shown is only illustrative, and that the invention may be carried out by other means and applied to uses other than those above set out.

I claim:

1. A grinding disk having a central opening therethrough and entrance and discharge openings bounded by bars integrally formed with the disk at the inner and peripheral walls of said openings, a bridge integrally formed with said bars and dividing said entrance and discharge openings, and grooves formed in the face of said disk.

2. A grinding disk having a central opening therethrough and entrance and discharge openings bounded by bars integrally formed with the disk at the inner and peripheral sides of said openings, said openings being divided by a bridge integrally formed with said disk, a stripper plate secured to said bridge within the discharge opening, and grooves formed in the face of said disk.

3. A grinding disk having grooves in its face with a receiving opening leading thereto and a discharge opening extending therefrom, a plate forming an end wall of one of said openings, said plate being of a length wider than said opening thereby extending into the metal comprising the side walls of said opening, said extending ends being amalgamated to form a substantially homogeneous mass between the two pieces.

4. A grinding disk having grooves in its face with a receiving opening leading thereto and a discharge opening extending therefrom, a plate forming the end wall of said receiving opening, said plate being of a length greater than the width of said opening thereby providing projecting ends extending into the metal of the disk at opposite sides of the opening and amalgamated therewith to form a substantially homogeneous mass between the two pieces.

5. The process of making a grinding disk that consists in forming the disk with a receiving opening therein and a plate secured to one wall of the opening in the process of casting, and then simultaneously forming grooves in the face of said disk and edge of said plate.

EUGENE D. DUMAS.