

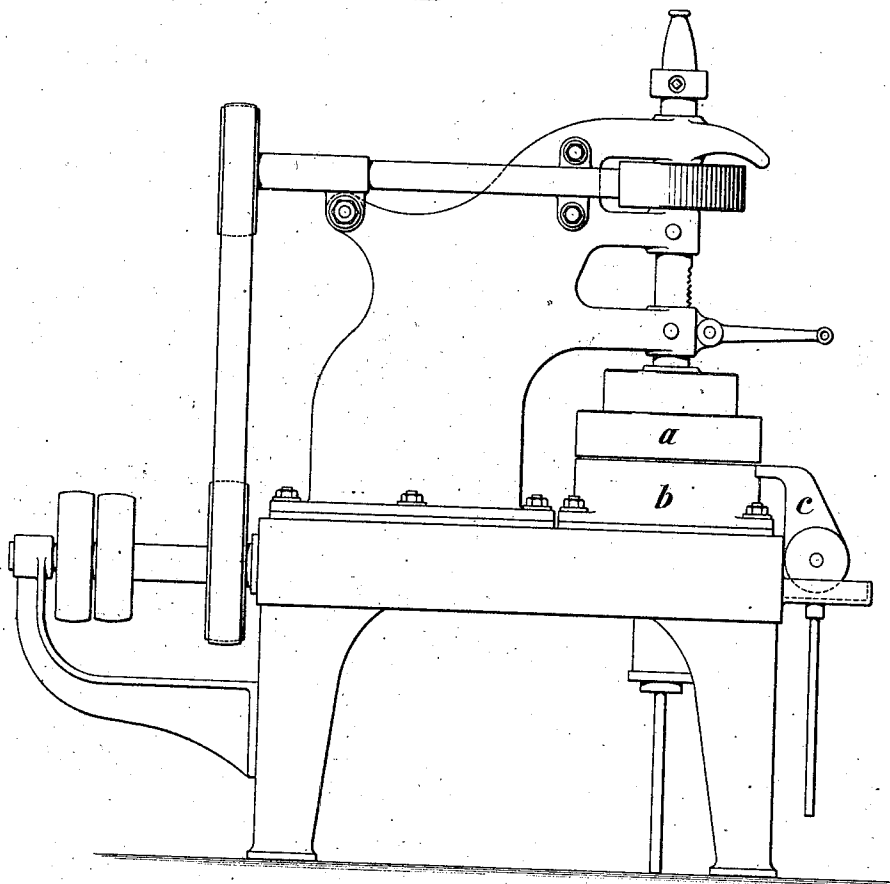
B. EITNER.
BALL GRINDING MACHINE.
APPLICATION FILED AUG. 31, 1909.

977,718.

Patented Dec. 6, 1910.

2 SHEETS-SHEET 1.

Fig. 1.



Witnesses:

W. Wallace

William F. Martinez

Inventor:

Berthold Eitner

By Attorneys:

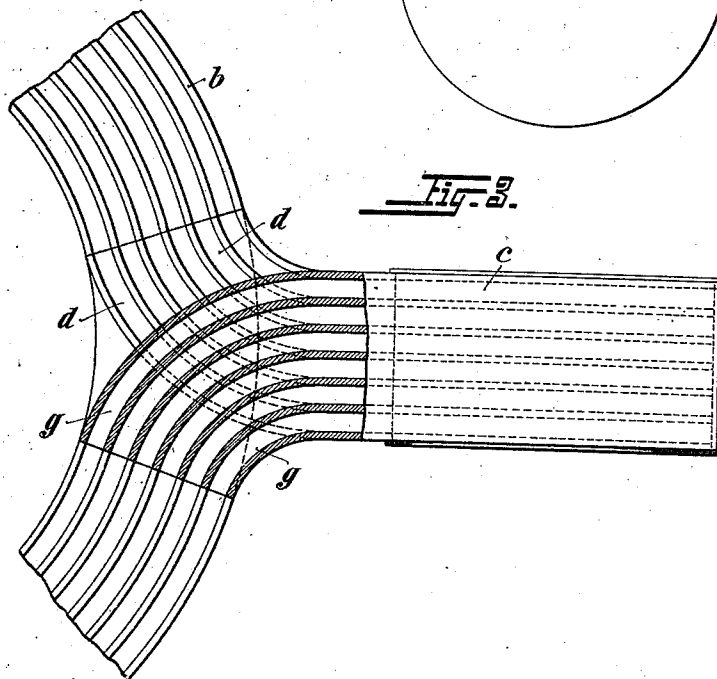
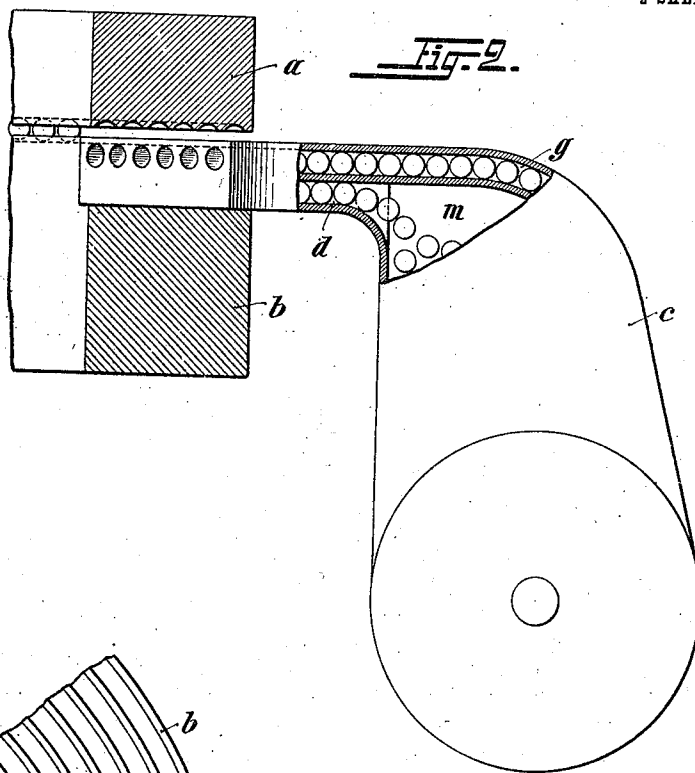
Arthur C. Rasor & Osina

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2 SHEETS-SHEET 2.



Witnesses:
W. Mallac
William F. Martinez

Inventor
Berthold Eitner
 By Attorneys
Arthur C. Fawcett & Co.

UNITED STATES PATENT OFFICE.

BERTHOLD EITNER, OF BERLIN, GERMANY.

BALL-GRINDING MACHINE.

977,718.

Specification of Letters Patent.

Patented Dec. 6, 1910.

Application filed August 31, 1909. Serial No. 515,389.

To all whom it may concern:

Be it known that I, BERTHOLD EITNER, work-master, a subject of the King of Prussia, residing at No. 14 Gotzkowskystrasse, Berlin, in the Kingdom of Prussia, Germany, have invented certain new and useful Improvements in and Relating to Ball-Grinding Machines, of which the following is a full, clear, and exact description.

The present invention has for its object an improvement in dry grinding machines for balls, its object being to obtain an increased output from machines of the type generally in use and precision in the grinding of the balls.

In accordance with the invention the grinding plates (one emery plate and one metal plate) are arranged to operate in a horizontal plane and in combination with the grooved metal plate which is fixed beneath the rotating emery plate, a device for removing and mixing the balls is connected with its edge. This device is fitted to the metal plate in such a manner that for the purpose of removing and returning the balls to be mixed an extension of the grooved paths is provided in the horizontal plate with annular grooves, this extension proceeding in curves outward to a mixing chamber and then being again curved inward so that the balls issuing from one grooved path are always able to enter another grooved path.

In the accompanying drawing, Figures 1, 2 and 3, illustrate the novel arrangement of the grinding plates and the means for deflecting and mixing the balls on a ball grinding machine of known construction.

Obviously the employment of the novel arrangement of the grinding plates to which the invention mainly relates is in no way confined to the construction illustrated and its details such as the method of driving, etc., but can be used for all kinds of dry grinding machines whatever the construction of their framework, and the method of driving them may be.

As shown in the drawing (Fig. 1) the grinding plates *a* and *b* are superposed and arranged to operate in a horizontal plane, the emery plate *a* forming the upper rotating plate, while the grooved metal plate *b* is the lower plate which is fixed to the frame or table of the machine. Laterally on the outer edge of this fixed metal plate *b* the device is provided for removing the balls

from time to time from the horizontal plate *b* and returning them to it in order to cause the balls to change their relative position and their groove paths.

The removal of the balls from the grooved metal plate *b* takes place, owing to the fact that the annular grooves in this plate are recessed at the place at which the device *c* is fitted, and that curved paths *d* (in the form of closed tubes or passages) are located in this recess and connect on the one hand with the outlets from the groove paths, and on the other hand open into the mixing reservoir or chamber *m*. For the purpose of re-conducting the balls similar curved paths *g* are provided connecting on the other side with the grooves in the annular plate and, running over the deflecting curves *d*, extend into the mixing chamber *m*. Owing to this guidance of the balls in these curves forming the continuation of the grooved paths in the metal plate outward to the mixing chamber and from this in a curve inward back to the plate, the certainty is attained that the balls leaving one groove path will always enter another groove path. Experience has shown that by this means the output of the machine is increased, and the balls are ground exactly to the extreme limit of tolerance.

What I claim as my invention and desire to secure by Letters Patent is:

1. A ball grinding machine comprising ball grinding plates operating in a horizontal plane, means for operating one of said plates, grooves in one of said plates and ball deflecting, mixing and returning means operating in conjunction with said grooved plate.

2. A ball grinding machine comprising an emery ball grinding plate, rotating in a horizontal plane, a cooperating stationary grooved plate, means adapted to operate said emery plate, and ball-deflecting, mixing and returning means operating in conjunction with said stationary grooved plate.

3. A ball grinding machine comprising ball grinding plates operating in a horizontal plane, means for operating one of said plates, grooves in one of said plates, a grooved ball deflecting member acting in conjunction with said grooved plate, the grooves in said ball deflecting member being continuous with the grooves in said plate, ball mixing means and ball returning means including a further grooved ball deflecting

member the grooves of which are also continuous with said grooved plate.

4. A ball grinding machine comprising a rotatable emery ball grinding plate, a stationary grooved ball grinding plate, means adapted to operate said emery plate to rotate in a horizontal plane, a grooved ball deflecting member acting in conjunction with said grooved plate, the grooves in said deflecting member being continuous with the grooves in said plate, ball mixing means

and ball returning means including a grooved ball deflecting member the grooves of which are also continuous with said grooved plate.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

BERTHOLD EITNER.

Witnesses:

ROBERT MICHELSKI,
WOLDEMAR HAUPT.