(No Model.)

J. FARRELL.

LEAD SHOT POLISHING MACHINE.

No. 259,835. Patented June 20, 1882.

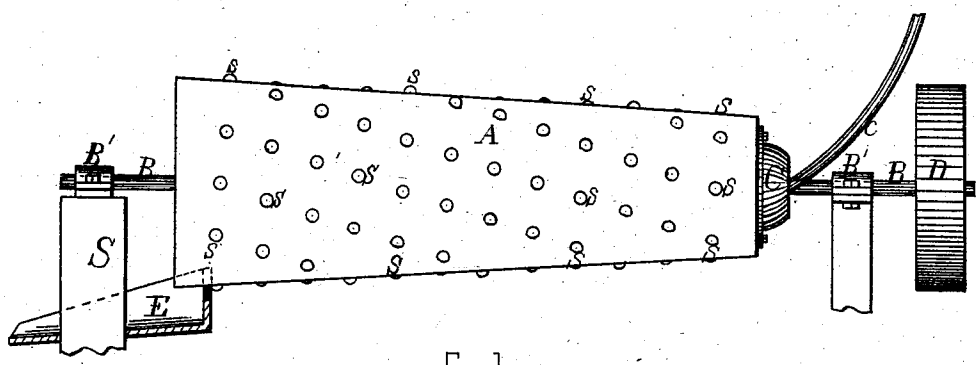


FIG. 1.

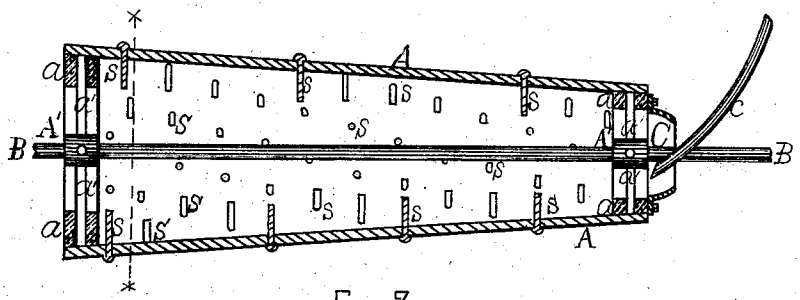


FIG. 2.

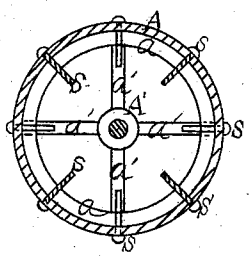


FIG. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN FARRELL, OF PITTSBURG, PENNSYLVANIA.

LEAD-SHOT-POLISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 259,835, dated June 20, 1882.

Application filed April 13, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN FARRELL, a citizen of the United States, residing at Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Lead-Shot-Polishing Machines; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a view in side elevation of my improved shot-polishing machine. Fig. 2 shows a longitudinal vertical section of the same; and Fig. 3 is a transverse sectional view taken in the plane of the line *x x*, Fig. 2.

My invention relates to certain improvements in apparatus for polishing lead shot, consisting of a conical rotary drum mounted horizontally, made by preference of wood, having provision for taking a supply of shot continuously at its smaller end and discharging it continuously at the larger end, with a series of pins projecting into the interior of the drum and arranged spirally with reference to the axis of rotation, whereby due separation is preserved between shot in different stages of polishing, the shot are worked uniformly from the inlet to the discharge, and distortion from a true spherical form by unequal wearing away at certain points is avoided.

In the drawings, A represents a conical drum, made by preference of hard wood, and mounted by spider-supports A′ on a horizontal shaft, B, which latter is supported by the usual or any suitable journal-bearings, B′, and driven by belt-pulley D or other suitable means of applying rotary motion.

The radial arms *a′* of the spiders A′ are seated or secured in rims *a*, which afford convenient means of supporting the drum A, and also partially close its ends, thus requiring a certain depth of shot to be maintained within the drum in order to pass over the rim *a* at the the discharge end.

The shot thus discharged are conveyed away by spout E, which is attached to and supported by the upright S, so as to permit the drum to rotate while the spout is stationary.

At the small end of the drum a pipe, *c*, supplies shot continuously from any suitable receptacle.

A conical or segmental chute or receiving-spout, C, is bolted or secured to the rim *a* outside of the spider A′, and is extended out from the end of the drum sufficiently to conduct the shot from pipe *c* through the spider to the interior of the drum.

Owing to the tapering form of the drum its bottom has a descending inclination from the receiving to the discharging end, down which the shot will work as they are moved by the rotation of the drum; but in such movement of the shot there is a marked tendency to maintain a certain axis of rotation, being held therein by the surrounding body of shot, and when this occurs the shot are worn or abraded out of true spherical form, and thus injured materially. Lead shot are peculiarly subject to this difficulty, owing to the soft and adhesive quality of lead, especially under heat and pressure. To prevent this I insert a series of pins, *s*, preferably of hard wood, through the drum, extending them into the interior a distance equal, or about equal to the depth of shot therein. The purpose or function of these pins is to turn the shot and change continually their relative positions or axes of rotation, thereby preventing the unequal wearing away of certain points. The pins are arranged at uniform intervals in the surface of the drum, and, by preference, in spiral lines circumferentially around it, so that they may exert a pushing or conveying tendency toward the discharge end, somewhat in the manner of spiral conveyers. They thus prevent the unpolished shot from mingling with or passing over the surface of the rest and secure uniform movement of the entire body through the drum and uniform polish throughout. By using pins much better results are secured than by spiral ribs, blades, or conveyers, since a revolving motion is imparted to the shot by pins, instead of a sliding motion, as with conveyers, and such rolling motion is given in directions other than that imparted by the rotary movement of the drum alone. The pins, being of hard wood, also afford polishing-surfaces extending into the body of shot, which give better results

than can be secured by rubbing lead upon lead alone or upon iron, and for this reason I prefer to use wooden pins.

Instead of making the drum A of conical form, it is obvious that a cylindrical drum may be employed, which may be mounted in an inclined position to give the desired descent to its bottom; but for convenience and economy in working I prefer to make use of the conical form with a horizontal axial shaft; also, with the conical form I secure a comparatively-shallow body or thickness of shot at and near the receiving end of the drum, where the shot are rough and more liable to stick, and a larger amount or body at the delivery end, where the shot are polished and move more freely.

I am aware that horizontal rotary drums of conical form have been employed in ore-washers, mortar-mixers, and similar machines which have a feed spout or chute at the larger end, a discharge at the smaller end, and pins, blocks and similar projections on the interior surface for effecting a separation or mixture of the charge, as the case may require; but none of such machines, so far as I am aware, are capable of use as shot-polishers, in part for the reason that the bulk of the charge is retained at the larger or feed end and is forced along an upwardly-inclined surface to the small end or discharge. This construction would cause such pressure upon the shot at the feed end, where it is rough, unpolished, and inclined to adhere, that it would be ruined or seriously injured by abrasion.

In my improved machine, with its feed at the smaller end, its discharge at the larger end, and a comparatively-unobstructed declining surface from the feed to the discharge ends, the shot are moved with little pressure downward until partially polished, and thereby enabled to withstand the weight of a greater body in the discharge end without injury. In this way the shot are gradually subjected to increased pressure, as better polish is secured and pockets, ribs, blocks, elevations, or depressions, which would tend to injure the shot, are avoided.

I claim herein as my invention—

1. The horizontal rotary drum A, of conical form, in combination with segmental chute C, secured to the smaller end for continuous feed, a discharge-spout, E, at the larger end, and a series of pins, *s*, projecting into the interior of the drum in spiral direction around its surface, substantially as set forth.

2. A shot-polishing drum, A, of wood, in combination with a segmental chute, C, at the receiving end for continuous feed, a rim, *a*, partially closing the delivery end for retaining a definite body of shot within the drum at its discharge end, and a series of wooden pins, *s*, projecting into the interior of the drum at intervals over its surface, substantially as set forth.

3. A rotary shot-polishing drum, A, of conical form, having a series of spirally-arranged pins, *s*, projecting into its interior, in combination with segmental receiving-chute C at the smaller end, discharge-spout E at the larger end separate from the drum, and a rim, *a*, in the delivery end of the drum, for retaining a quantity of shot therein, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN FARRELL.

Witnesses:
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