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G. A. CURTIS.

TUMBLING APPARATUS.

APPLICATION FILED NOV. 8, 1902.

NO MODEL.

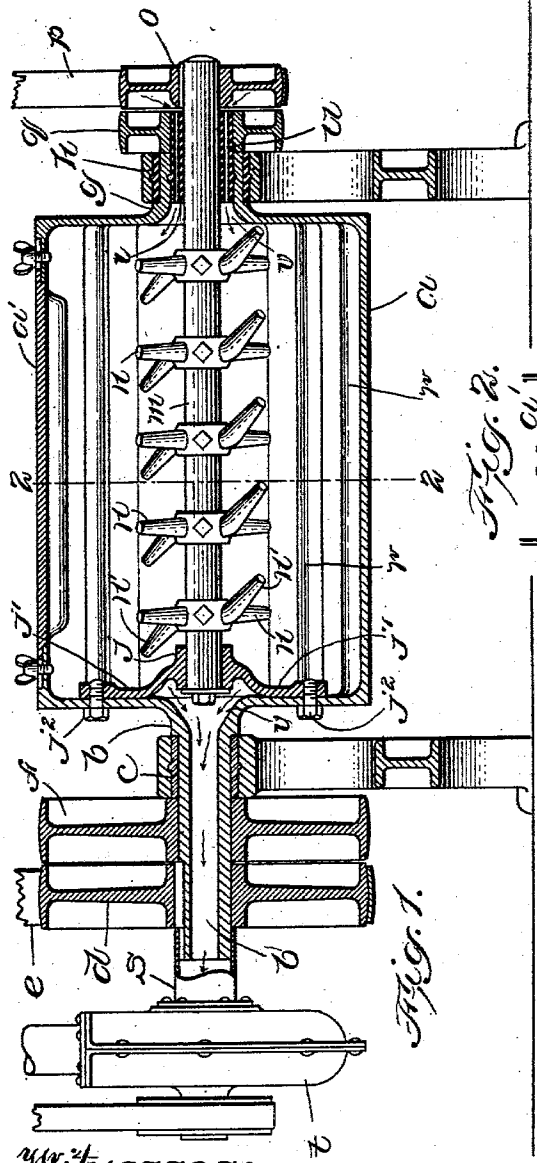


Fig. 1.

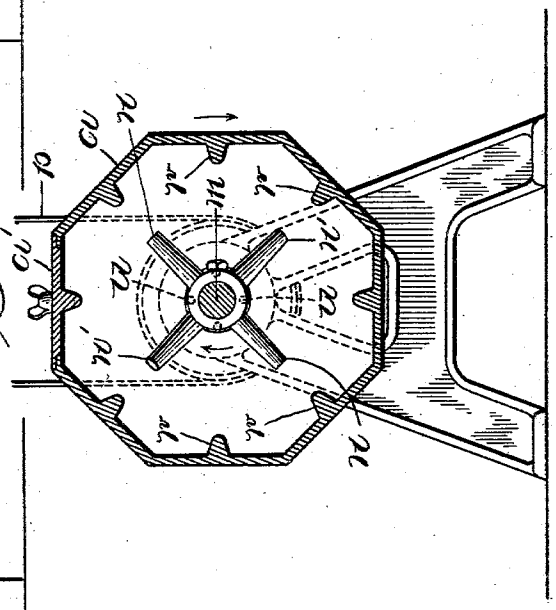


Fig. 2.

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UNITED STATES PATENT OFFICE.

GEORGE A. CURTIS, OF MEDFORD, MASSACHUSETTS, ASSIGNOR TO CHARLES F. BAKER, OF BOSTON, MASSACHUSETTS.

TUMBLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 721,027, dated February 17, 1903.

Application filed November 8, 1902. Serial No. 130,568. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. CURTIS, of Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Tumbling Apparatus, of which the following is a specification.

This invention relates to apparatus for tumbling nails and other metallic articles, and particularly for tumbling boot and shoe nails which are formed between dies, said dies leaving fins upon the edges of the nails, the object of the tumbling operation being to remove the fins.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a longitudinal section of a tumbling apparatus embodying my invention. Fig. 2 represents a section on line 2 2 of Fig. 1.

The same reference characters indicate the same parts in both the figures.

In the drawings, *a* represents a rotary casing adapted to contain a charge of nails or other articles to be tumbled, said casing being provided at one side with an opening having a closely-fitting cap or cover *a'*. To one of the ends or heads of the casing is affixed a trunnion *b*, journaled in a fixed bearing *c*. To said trunnion is fixed a pulley *d*, which engages a driving-belt *e*, whereby rotary motion may be imparted through the trunnion *b* to the casing.

f is a loose pulley mounted on the trunnion *b* beside the fast pulley *d*. The opposite end or head of the casing is provided with a trunnion *g*, which is journaled in a fixed bearing *h*. The trunnion *g* is tubular, and within it is placed an inclosed box or bearing *i*, which may be a sleeve of Babbitt metal affixed to the inner surface of the tubular trunnion *g*. *j* represents another inclosed bearing, which is located within the casing *a* near the end or head from which the trunnion *b* projects, said bearing *j* being provided with arms *j'*, which are affixed by bolts j^2 to one of the heads of the casing *a*.

m represents a shaft which is journaled in the inclosed bearings *i* and *j* and is provided with a plurality of radially-arranged arms or beaters *n n'*. The shaft *m* is extended through and outside of the bearing *j*, its projecting portion being provided with a fast pulley *o*, which engages a driving-belt *p*. A loose pulley *q* is located beside the fast pulley *o*.

The casing *a* is preferably polygonal in cross-section, as shown in Fig. 2, and its inner surface is provided with a series of ribs or inwardly-extending projections *r*.

In practice the casing is rotated by the belt *e* and pulley *d* in one direction, and the shaft *m* is at the same time rotated by the belt *p* and pulley *o* in the opposite direction, as indicated by the arrows in Fig. 2, so that nails placed in the casing are violently agitated and thrown about in such manner that they are quickly stripped of the fins left upon them during the process of manufacture. The arms or beaters *n* are preferably arranged substantially at right angles with the axis of the shaft *m*, while the arms or beaters *n'* are preferably inclined relatively to said axis, all as shown in Fig. 1, this arrangement of the arms or beaters distributing their acting portions so that there is no part of the central portion of the casing across which the nails can pass without encountering one or more of said arms.

The trunnion *b* is preferably tubular and provided with an air-passage *b'*, which communicates at one end with the interior of the casing through air-openings between the inner end of the passage and the bearing *j* and at the other end with a fixed flue *s*, which surrounds the projecting end of the trunnion *b* and communicates with the casing *t* of an exhaust-fan or air-exhausting apparatus, which may be of any suitable construction. The operation of the exhausting apparatus causes the removal from the casing of the metallic and other dust therein, so that the tumbling action is not obstructed or interfered with by the presence of fine particles of metal within the casing. The described means for exhausting air from the casing is also useful during a certain portion of the operation—that is to say, in removing sawdust from the casing. When the nails are first introduced, their surfaces are usually coated with oil, and to absorb this it is customary to put sawdust with the nails in the casing at the commence-

ment of the operation. The air-exhausting apparatus may be made temporarily inoperative until the nails have been tumbled sufficiently to cause the absorption of the oil by the sawdust, after which the exhausting apparatus is set in operation and removes the sawdust and afterward the metallic dust, as above stated.

I prefer to provide means for admitting air to the end of the casing opposite the end to which the exhaust-trunnion *b* is connected. Said means, as here shown, comprise air-ducts *u*, formed in the inclosed bearing *i*, although it is obvious that said ducts may be formed in the end or head of the casing from which the trunnion *g* projects.

The ribs or projections *r* constitute carriers adapted to raise the nails from the lowest portion of the casing nearly to the highest portion and to drop the nails at a point over the beaters, thus causing all the nails to pass repeatedly through the portion of the casing in which the beaters move. The nails are prevented from entering the air-passages *b* and *u* by the flaring or tapering portions *v v* of the internal surfaces of the tubular trunnions, said flaring portions giving the inner portions of the passages a downward and inward inclination, causing nails which enter them to return to the interior of the casing.

I find it advisable to rotate the shaft *m* at a much higher rate of speed than the casing *a*. I prefer to drive the shaft at the rate of about six hundred rotations per minute and the casing at the rate of about sixty rotations per minute. This relatively high speed of the shaft is rendered feasible by the pulley and belt employed to rotate the shaft.

I claim—

1. A tumbling apparatus comprising a rotary casing having trunnions at its ends journaled in suitable bearings, a shaft within the casing provided with beaters, means for independently rotating the casing and shaft, means for exhausting air from one end of the casing, and means for admitting air to the opposite end of the casing.

2. A tumbling apparatus comprising a rotary casing having tubular trunnions at its ends journaled in suitable bearings, one of said trunnions constituting an exhaust-outlet communicating with the interior of the casing, while the other trunnion is provided internally with an inclosed bearing, another inclosed bearing affixed to the casing adjacent to the exhaust-trunnion, a shaft journaled in said inclosed bearings and extended through one of the trunnions, said shaft having beaters within the casing, and means for independently rotating the casing and shaft.

3. A tumbling apparatus comprising a rotary casing having inwardly-extending projections on its inner surface adapted to raise the articles in the casing and drop the same from the upper part of the casing, a shaft journaled in the casing and having outwardly-projecting arms or beaters adapted to act on the articles dropped by said projections, and means for independently rotating said casing and shaft.

4. A tumbling apparatus comprising a rotary casing, a shaft journaled in the casing and having beating-arms which are inclined relatively to the axis of the shaft and other arms arranged substantially at right angles with said axis, and means for independently rotating the casing and shaft.

5. A tumbling apparatus comprising a rotary casing having trunnions at its ends journaled in suitable bearings, one of said trunnions having an air-exhaust passage, an inclosed bearing within the casing adjacent to the inner end of the exhaust-passage and separated therefrom by openings admitting air to the said passage, another inclosed bearing in the other trunnion, a shaft journaled in said inclosed bearings and extended through the last-mentioned trunnion, the said shaft having beaters within the casing, means for independently rotating the casing and shaft, and means for exhausting air from the casing through said passage and openings.

6. A tumbling apparatus comprising a rotary casing having trunnions at its ends journaled in suitable bearings, one of said trunnions having an air-exhaust passage which is flared or tapered at its inner end to give its lower surface a downward and inward inclination and prevent the entrance into said passage of the tumbled articles, and means for exhausting from the casing through said passage.

In testimony whereof I have affixed my signature in presence of two witnesses.

GEORGE A. CURTIS.

Witnesses:

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E. BATCHELDER.