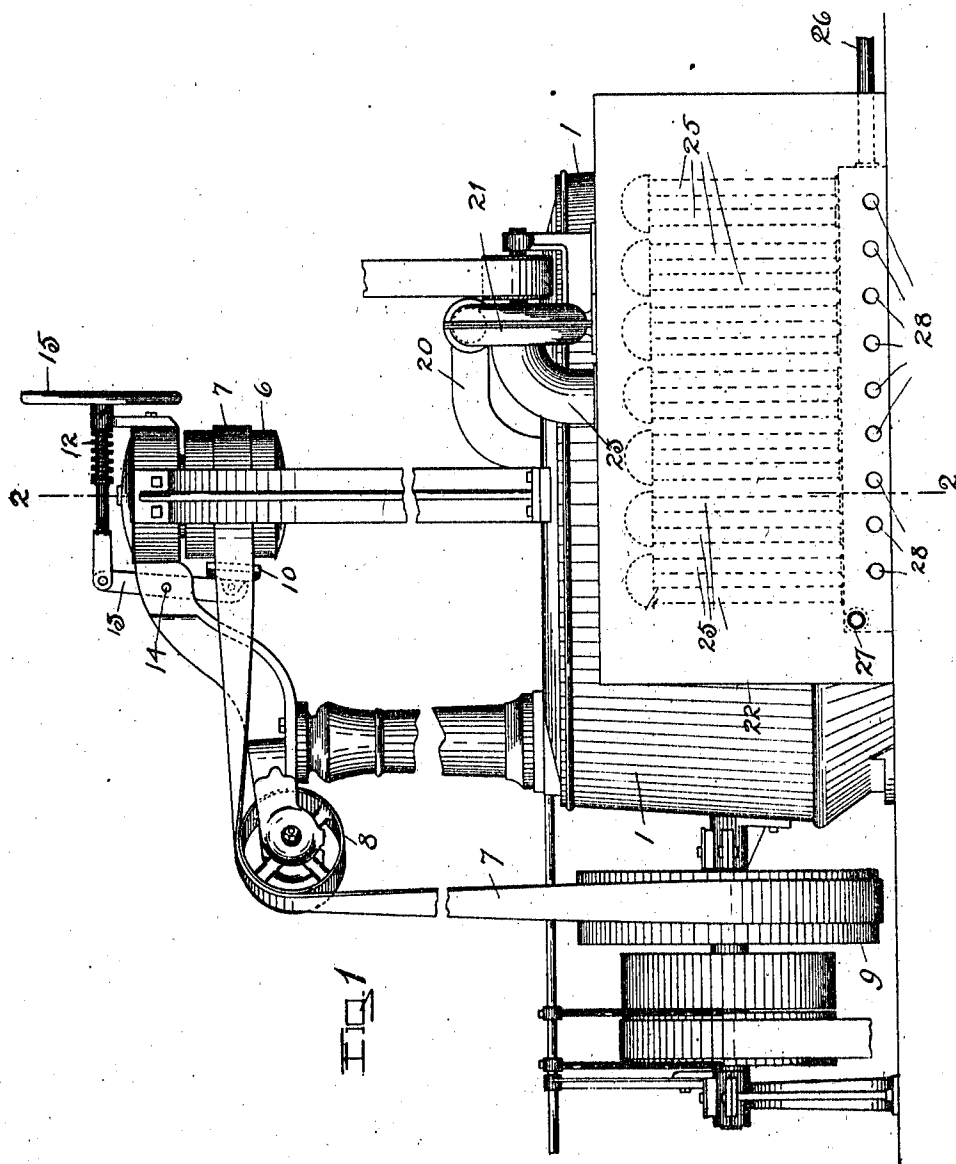


F. A. TOLHURST.
ART OF DRYING AND POLISHING.
APPLICATION FILED JUNE 29, 1908.

1,003,827.

Patented Sept. 19, 1911.

2 SHEETS—SHEET 1.



WITNESSES

J. Donsbach.
G. C. Kennedy

INVENTOR

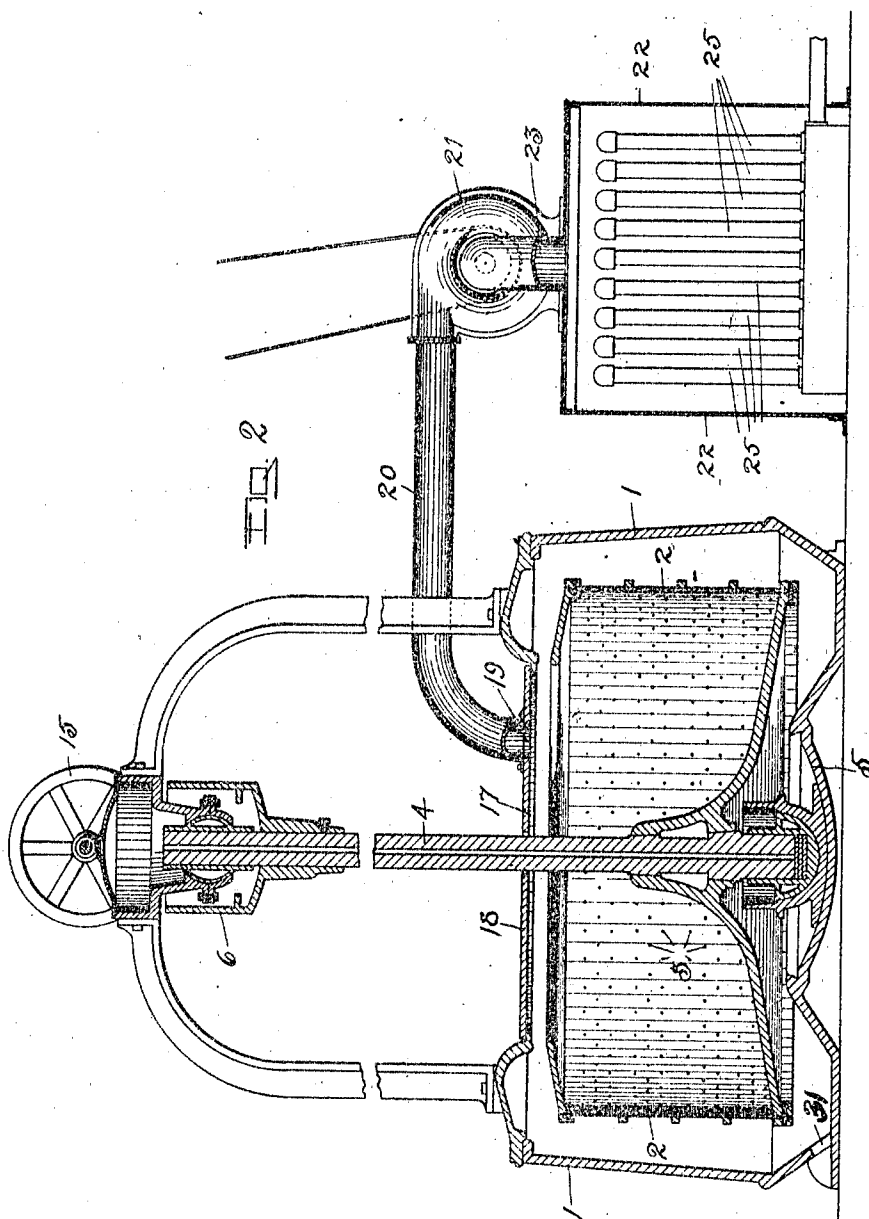
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INVENTOR

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UNITED STATES PATENT OFFICE.

FREDERICK A. TOLHURST, OF NEW YORK, N. Y., ASSIGNOR TO TOLHURST MACHINE WORKS, OF TROY, NEW YORK, A CORPORATION OF NEW YORK.

ART OF DRYING AND POLISHING.

1,003,827.

Specification of Letters Patent. Patented Sept. 19, 1911.

Application filed June 29, 1906. Serial No. 440,858.

To all whom it may concern:

Be it known that I, FREDERICK A. TOLHURST, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in the Art of Drying and Polishing, of which the following is a specification.

The invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification. Similar characters refer to similar parts in the several figures therein.

The invention relates to drying and brightening acid-dipped and electro-plated metal articles.

It is customary in the manufacture of many kinds of metal articles, as one of the final steps in such manufacture, to dip them into an acid solution to remove the traces of manufacturing, as for instance to remove fire marks, or to clean them from metal dust, oil, dirt accidentally collected, or other foreign or undesirable matter to put them in final commercial condition. Other metal articles are electroplated. In the case of the articles which are acid-dipped, and in the case of those which are electro-plated also, it is necessary that the liquid in which they were immersed be removed quickly and uniformly from all parts of the surface to prevent oxidation, corrosion and stain. It is further necessary to "brighten" these surfaces, that is, to impart to them the uniform lustrous and bright appearance common to the completed commercial articles of these classes. Heretofore such articles have been dried and brightened by being tumbled in barrels, or shaken in sieves, containing hard wood saw-dust. The particles of saw-dust by reason of their porosity absorb the moisture from the surface of the articles, and serve also by a sort of gentle attrition or buffing action to brighten the articles, that is, to give them the lustrous appearance which constitutes the commercial finish. The work as performed with the saw-dust and attendant apparatus is tedious and laborious, and where conducted on a large scale involves considerable apparatus in the way of tumbling barrels, saw-dust bins, etc.,

and requires also much manual labor. Furthermore, the saw-dust is constantly deteriorating, as it absorbs the moisture from repeated operations and is therefore uncertain and non-uniform in its action, and is both a troublesome and costly element in the manufacturing work. Furthermore, this operation constitutes a very large proportion of the expense of production, especially where the articles are small and the price thereof low. In the case of threaded articles, the saw-dust has been objectionable, and has deteriorated the commercial value of the product by remaining adherent to the threads.

The present invention dries and brightens such acid-dipped and electro-plated metal articles with great rapidity, is capable of acting at one time on exceedingly large quantities of such articles to simultaneously brighten and dry them, even when such articles with great rapidity, is capable of or elaborate form, and will accomplish the work at a very low cost.

According to the present invention a mass of the metal articles are taken wet from the cleaning or electrolytic bath and are subjected to the action of a blast or current of hot, dry air moving at great velocity, and in accordance with one feature of the invention, the mass of articles is at the same time moved in a transverse direction to the direction of movement of the current of air, and also preferably at a high velocity. The articles are thus dried and at the same time brightened, or rendered lustrous to a very high degree, giving them a pleasing, satisfactory and superior commercial finish. Both the drying and brightening action is accomplished by the action of rapidly moving air currents, and not by any attrition due to movement of the articles in the mass either against or relatively to each other, or against any other substance. In fact with most such articles, it is essential that they be at rest relatively to each other individually, as they would otherwise be scratched and abraded so as to be uncommercial.

The movement of the air and of the mass of articles in transverse directions serves to render the drying and brightening action of the air uniform in all parts of all the articles, notwithstanding intricacy of shape in the articles, and also notwithstanding that the articles may individually be very

small and the mass of articles operated upon at one time be relatively very great. This appears to be due to an intense vortex action of the air set up between and around all parts of the massed articles, whereby all the parts of the articles are reached and acted upon by the violently moving air currents.

In the accompanying drawings there is illustrated an apparatus which has been found to be suitable and convenient for carrying out or practicing the method constituting my invention, and the invention is described more in detail in connection with and by the aid of, said drawing.

Referring to the drawings, Figure 1 is an elevation of an apparatus for supplying a strong current of hot and dry air to a mass of such metal articles while the metal articles are also in motion at a high velocity; and Fig. 2 is a substantially central section on the line 2—2 of Fig. 1.

The apparatus for giving motion to the mass of articles has a rotatory movement and is arranged to dispose the articles very advantageously to the action of the air through the operation of centrifugal force.

Referring to the illustrated apparatus more in detail, an outer casing 1 is shown inclosing a container or basket 2, fixed to rotate with a central shaft 4. The lower end of the shaft 4 rotates in a part 32 of rounded, or substantially hemispherical form. This part 32 rests also upon a concaved member 33, which in turn rests in a saucer-shaped part 5 of the case 1. The sides, or vertical walls, of the container or basket 2 are provided with a large number of relatively small apertures 3, which are designed to permit the air to pass there-through while retaining the articles within the basket 2.

The spindle 4 may be driven in any suitable manner, and is shown provided with a pulley 6 over which passes a belt 7, said belt running over a guide wheel 8 to a driving pulley 9. A suitable brake may be provided, and brake shoe 10 is shown acting against the pulley 6, said brake shoe being mounted on the lever 13 pivotally supported on the frame at 14. Pivotally connected to the other end of the lever 13 is a screw-threaded rod 12 threaded into a recessed lug or support on the machine frame. A hand wheel 15 serves to rotate the rod 12 and to apply or release the brake.

The upper portion of the casing 1 is provided with an opening 17 to which a suitable lid 18 is fitted. A pipe or conduit 20 passes into an aperture 19 in the lid to supply the air for the drying and brightening operation. A pump 21 is shown for driving the air through the pipe 20, and a pipe 23 communicates from the air pump 21 to a suitable air-heating and drying chamber 22.

Within said chamber is shown a series of steam coils 25, supplied from a pipe 26, for heating and drying the air as it is drawn in by the pump 23, the steam passing out through the pipe 27. The apertures 28 serve to admit the air to the heating and drying apparatus.

After the articles are placed within the basket or container 2, and the basket is started into motion, at first slowly and then more and more rapidly until a high velocity is attained, the wet metal articles within the basket 2, by reason of centrifugal action, will distribute themselves up and around the vertical sides of the basket or container 2 leaving the central part empty. At the same time the hot dry air is forced at great velocity into the interior of the basket or container, and by reason of the pressure and the centrifugal action is driven at great velocity through all parts of the mass of articles and about and against all surfaces of the articles in the mass, finally passing out through the apertures 3. This air then escapes through one or more openings 31, located in the outer periphery of the casing 1. It will thus be seen that the various articles in the mass are at rest with respect to each other, and that they are moving at great velocity in one direction while subjected to the action of a current of hot and dry air moving in a transverse direction, or in reality in a great number of various transverse directions. This transverse movement causes the air to act equally upon all sides and upon all surfaces of the metal articles, whether interior or exterior, and not only does it dry them quickly and easily, but gives them the uniform lustrousness or brightness so desirable and necessary as a commercial finish, the finish imparted by this method being more uniform and brighter than by tumbling in saw-dust.

I claim—

1. The process of simultaneously drying and brightening metal articles taken from an electrolytic bath which consists in forcing hot, dry air at high velocity through a mass of said articles while wet to simultaneously dry and brighten them.

2. The process of drying and brightening dipped or plated metal articles, which consists in forcing a current of hot, dry, air through a mass of said articles while the mass of articles is in rapid motion in a transverse direction to the direction of the air current.

3. The process of drying and brightening dipped or plated metal articles, which consists in forcing a current of hot, dry, air through a mass of said articles while the mass of articles is in rapid motion in a transverse direction to the direction of the air current, the articles constituting the

mass being at rest with respect to each other.

4. The process of drying and brightening dipped or plated metal articles which consists in forcing a current of hot, dry, air through a mass of said articles subjecting a mass of said articles to rapid rotation, whereby the mass is subjected to restrained centrifugal action and the articles constituting the mass are at rest with respect to each other, and introducing dry air under pressure near the center of rotation of said mass and forcing it outwardly through said mass.

5. The process of drying and brightening dipped or plated metal articles taken from an electrolytic bath, which consists in forcing a current of dry air through a mass of said articles while the mass of articles is in rapid motion in a transverse direction to the direction of the air current, the articles constituting the mass being at rest with respect to each other,

6. The process of drying and brightening dipped or plated metal articles taken from an electrolytic bath which consists in forcing a current of dry air through a mass of said wet articles in a plurality of directions and at a high velocity, whereby said air currents will act directly upon all surfaces of the articles and upon all the articles of the mass whereby the articles are both dried and brightened simultaneously.

7. The process of drying and brightening dipped or plated metal articles taken from an electrolytic bath which consists in rapidly moving a mass of said articles and forcing a current of dry air through said mass of articles in a direction different from the direction of motion of said mass.

In testimony whereof, I have hereunto set my hand this 25th day of June, 1908.

FREDERICK A. TOLHURST.

Witnesses:

HOWARD CAMPBELL,
PETER FLINT.