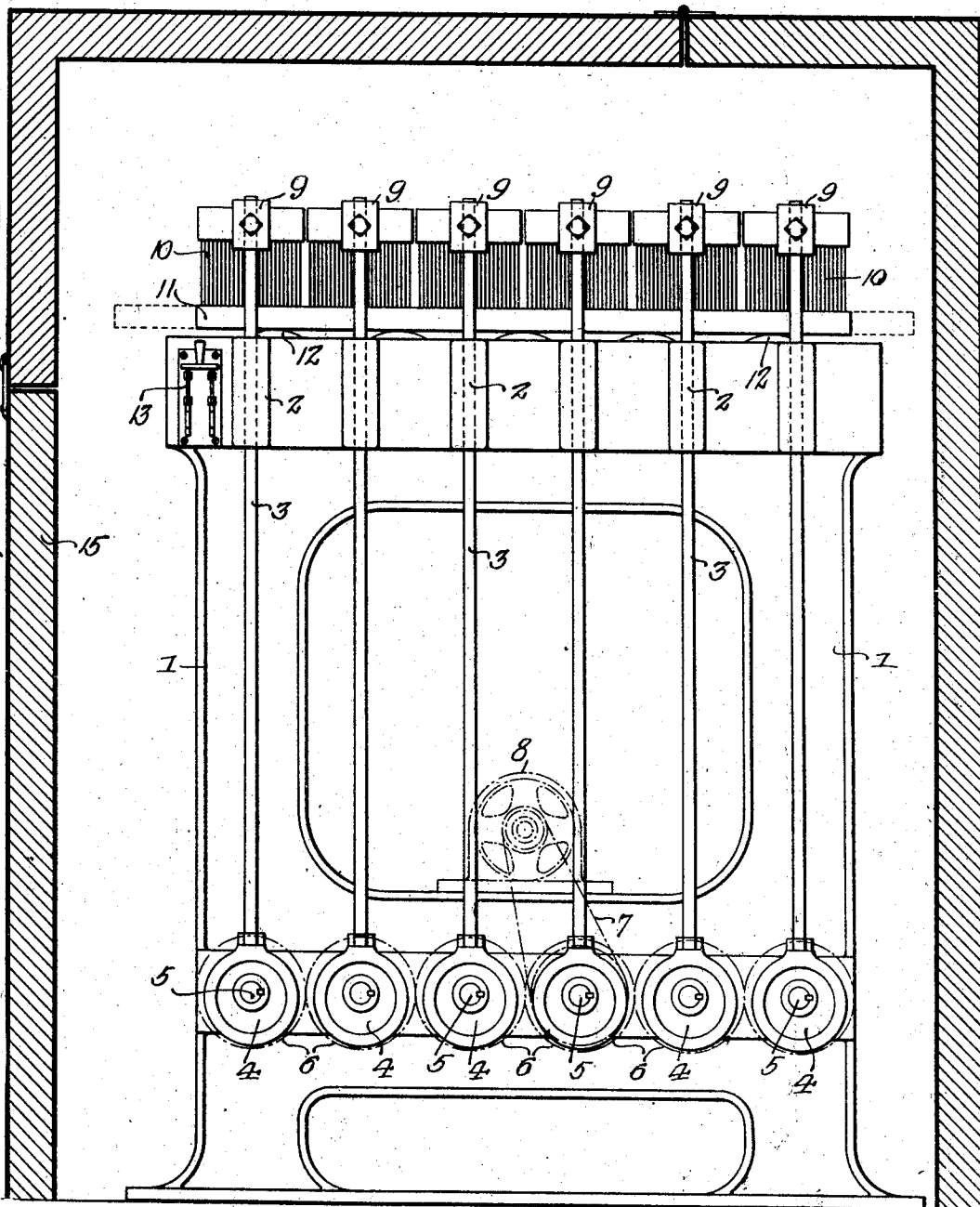


W. H. WELSH.
 PROCESS OF PREPARING MATRICES FOR ELECTROTYPING.
 APPLICATION FILED MAR. 30, 1912.

1,049,787.

Patented Jan. 7, 1913.



Witnesses—
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UNITED STATES PATENT OFFICE.

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PROCESS OF PREPARING MATRICES FOR ELECTROTYPING.

1,049,787.

Specification of Letters Patent.

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Application filed March 30, 1912. Serial No. 687,465.

To all whom it may concern:

Be it known that I, WILLIAM H. WELSH, a citizen of the United States, and a resident of Collingswood, Camden county, New Jersey, have invented an Improved Process of Preparing Matrices for Electrotyping, of which the following is a specification.

My invention relates to the art of electrotyping, and consists of certain improvements in the process of preparing the wax matrices for the reception of the electro-deposited shell or coating. The method of procedure, well known of course, is to surface coat the wax matrices with blacklead or plumbago to form one of the poles of an electric couple in order that the metal may be electro-deposited thereon. The success of the work depends largely upon the successful application of the blacklead or plumbago. By preference, the matrices should be blacklead in such manner as to present a metallic luster, and in order to produce this effect the blacklead must be vigorously applied to the surface of the wax in such manner as to insure absolutely its application to every part of the matrix. The means ordinarily employed for this purpose are rapidly oscillating brushes which tap the surface of the wax in a very rapid manner, but relatively delicately in order that excessive wear of the brush on the one hand, and battering of the type recesses and half-tone impressions on the other hand, can be avoided.

The figure of the drawing illustrates diagrammatically a blackleading machine ordinarily employed at the present day, and one feature of my invention is the maintenance of such machine in an artificially cooled room or apartment whereby the wax matrix undergoing the blackleading treatment shall be maintained at a suitably cooled temperature which will insure its relative hardness, permitting a relatively violent application of the brushes designed to apply the blacklead to the surface thereof.

I have shown in the drawing a blackleading machine, inclosed in a cooling chamber or compartment, comprising a suitable frame 1, having guideways 2, for vertically reciprocating rods 3, attached to pitmen 4, on shafts 5; all of which may be preferably driven in the same direction by the gearing 6, indicated by the broken lines; motion being preferably imparted to such gearing

by a belt 7 from a motor 8. The upper ends of the rods are secured at 9 to brushes 10, and rapid movement of said rods by the means described causes the brushes to rise and fall upon the plate and beat into or onto the surface of the matrix the blacklead. The matrix is indicated at 11; being preferably mounted upon rollers, or other suitable ways, 12; means being provided to reciprocate the matrix. The range of movement may be that indicated by the dotted lines. The frame may be provided with a switch 13 for controlling the motor. The cooling chamber or compartment 15 may have a door or lid giving access to the blackleading machine.

Under ordinary circumstances, the waxed plate having type and half-tone impressions, singly or combined, is placed in the machine upon suitable means whereby it may be traversed back and forth; being subjected while moving to the action of the vertically reciprocating brushes; blacklead or plumbago being dusted upon the surface of the same as may be required to properly cover or coat such surface to be subsequently plated with the deposited metal.

In most electrotyping shops, the temperature ranges fairly high, and in general the consistency of the wax is relatively softer than it should be to insure the production of a perfect matrix. In such instance, the action of the brushes tends to flatten the relatively delicate half-tone impressions; to break down the edges of the type recesses in the matrix; to separate from the matrix minute particles of the wax of which they are composed, and to cause the ends of the bristles to pick up minute particles, a condition which not only spoils the matrix, but also clogs the ends of the bristles and renders them substantially inefficient. I propose therefore to remedy these defects; improve the quality of the matrix; insure the proper action of the brush, and prolong the life of the same by maintaining the matrix at a relatively low temperature during the blackleading operation. This may be accomplished in a number of ways. A separate apartment, such as a refrigerator or the like, may receive and serve as a temporary storage receptacle for a quantity of the waxed plates after they have received the type, half-tone and the like impressions. These plates are then taken to the blackleading machine while

at substantially the temperature referred to and they may be kept at such temperature by cooling means applied directly to the blackleading machine, or to a compartment in which it is located, so that while the blackleading operation is proceeding, the matrix is still cool and relatively hard.

The result of the operation of blackleading the cool, relatively hard wax plate is to impart a high metallic luster to the same; the blacklead being beaten onto or into the surface of the same so as to afford a proper surface, insuring the deposition of metal in a proper manner with respect to the type recesses and half-tone impressions of the matrix.

This improved method of procedure is particularly applicable to matrices which are to be plated initially with a nickel or nickel-steel surface. In ordinary electrotyping, the copper deposit is facilitated by a slight surface deposit of copper applied by precipitating the metal from a solution of copper sulfate and iron filings, and any uncoated gaps which might occur at, in or adjacent the walls of the type recesses or the half-tone impressions may be bridged without difficulty and without damage to the electrotype. In the formation of a nickel or nickel-steel surface, however, the deposit must take place wholly within the bath and it is impossible to bridge any gaps which may occur in the wall surfaces of the type impression recesses. This makes it absolutely necessary that the coating of such walls shall be complete and this result is attained in carrying out the process forming the subject of my invention.

It will be understood, of course, that the cooling of the matrix should not be carried to such an extent as to render the wax brittle. Proper cooling insures full advantage of the natural tough qualities of the wax employed and, other conditions governing to a greater or less degree, I have discovered that the desirable temperature is to be found between 45° to 60° F.

I claim:

1. In the art of electrotyping, the process of preparing matrices, which consists in cooling the same to a temperature not exceeding 60° F., maintaining said matrices at such temperature, and simultaneously apply-

ing blacklead by a series of sharp blows distributed over the surface of the matrix. 55

2. In the art of electrotyping, the process of preparing matrices, which consists in cooling the same to a temperature not exceeding 60° F., maintaining said matrices at such temperature, simultaneously applying blacklead by a series of sharp blows distributed over the surface of the matrix, and moving said plate while the blacklead is being applied. 60

3. In the art of electrotyping, the process of preparing matrices, which consists in maintaining said matrices at a temperature not exceeding 60° F., and applying the blacklead by a series of sharp blows distributed over the surface of the matrix while the matrix is maintained at such temperature. 65 70

4. In the art of electrotyping, the process of preparing matrices, which consists in maintaining said matrices at a temperature between 45° and 60° F., and applying the blacklead by a series of sharp blows distributed over the surface of the matrix while the matrix is maintained at such cool temperature. 75 80

5. In the art of electrotyping, the process which consists in cooling a waxed type or half-tone impression plate forming the matrix to a temperature not exceeding 60° F., applying blacklead to the surface thereof, and causing such blacklead to adhere to the surface by the application of blows momentarily applied and distributed over the surface of the plate. 85

6. In the art of electrotyping, the process which consists in cooling the waxed type or half-tone impression plate forming the matrix to a temperature between 45° and 60° F., applying blacklead to the surface thereof, and causing such blacklead to adhere to the surface by the application of blows momentarily applied and distributed over the surface of the plate. 90 95

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses. 100

WM. H. WELSH.

Witnesses:

MURRAY C. BOYER,
WM. A. BARR.