M. M. WISE.

PROCESS FOR COATING METALS.

APPLICATION FILED DEC. 11, 1918.

1,312,716. Patented Aug. 12, 1919.

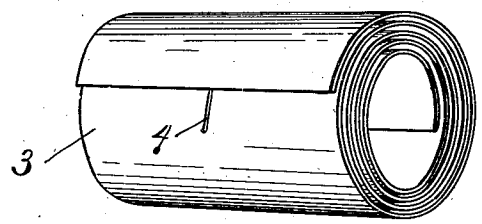



Fig. 1.

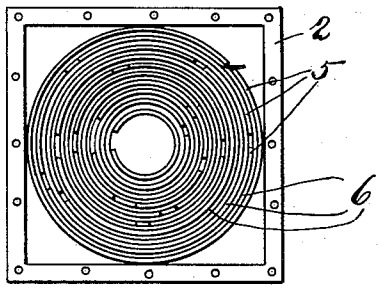



Fig. 3.

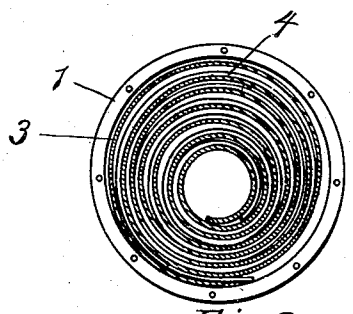



Fig. 2.

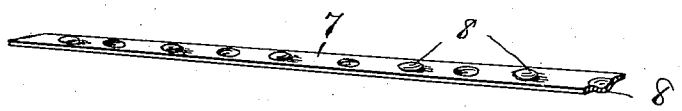



Fig. 4.




Fig. 5.

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## PROCESS FOR COATING METALS.

1,312,716. Specification of Letters Patent. Patented Aug. 12, 1919.

Application filed December 11, 1918. Serial No. 266,265.

*To all whom it may concern:*

Be it known that I, MAXWELL M. WISE, a citizen of the United States, and residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Process for Coating Metals, of which the following is a specification.

This invention relates to the art of depositing metals upon metals by what is often known as the dry galvanizing process, that is, by heating the metals to be coated when in intimate contact or packed in with finely divided particles of the coating metal. The object of the present invention is a process for coating thin sheets of metal which will not cause these sheets to bulge, twist or otherwise distort.

This invention consists in curving the sheets of metal, preferably by rolling them into spirals, or cylinders, then packing the curved sheets in a treating chamber with finely divided coating material, with or without the addition of inert matter, and then heating the sheets and coating material sufficiently to deposit the coating metal upon the sheets in a metallic state. It also consists in spacing these curved sheets by means of slender rods, wires, cables or tapes of metal or asbestos so that the finely divided coating material may reach every portion of the surfaces to be treated. It further consists in turning the treating chambers during the operations in order that the coating material may be sifted in between contacting surfaces of the sheets and spacers.

In the accompanying drawing, Figure 1 shows a sheet of metal rolled into a spiral, the convolutions being spaced by means of a wire. Fig. 2 shows this spiral in a cylindrical treating chamber. Fig. 3 shows a series of short sheets in cylindrical form in a rectangular treating chamber. Figs. 4 and 5 show different types of spacers.

Similar reference characters refer to like parts throughout the several views.

Numerous attempts to coat sheets of metal by the process set forth in the Cowper-Coles Patent No. 701,298 dated June 3, 1902, have been failures because the sheets which were flat when placed within the treating receptacles were twisted, buckled or covered with welts or other distortions when removed therefrom.

I have found that when such sheets are rolled into cylinders or spirals, the convolutions being kept apart by separators to permit the coating metal to come into contact with all of the surfaces of the sheets, and these curved sheets are then placed within the treating chambers, the spaces filled with coating powder, and the sheets and powder heated for a proper length of time, that when removed and unrolled the sheets are as smooth and flat as when they were inserted.

While this process is not limited to any particular coating metals or to sheets of any particular material, it is especially useful in coating sheets of iron and steel with zinc or antimony, as sheets of iron and steel are particularly liable to distort and as these sheets are usually more in need of such coating because more readily affected by the atmosphere.

The treating chamber may be of any desired cross section, the chamber 1 shown in Fig. 2 being a cylinder and the chamber 2 shown in Fig. 3, being square in cross section. The sheets may be rolled into the spirals 3 as shown in Figs. 1 and 2 and the convolutions may be separated by a continuous wire 4, or the sheets 5 may be short and constitute parts of cylinders, separated by consecutive separators 6.

In Fig. 4 is shown a band or tape 7 having small knobs 8 on opposite sides, which band also constitutes a desirable separator. The twisted member 9 may be of metal or of asbestos. The rolled sheets and the spacers between them are placed within the treating chamber and finely divided coating metal (partly in the form of oxid and with or without an admixture of inert material such as finely crushed sand and coke) is sifted and packed in around the sheets, after which the chamber is closed and then heated sufficiently to cause the finely divided coating metal to unite with the sheets in metallic state. The chamber is preferably rotated during this treatment.

When a flat sided treating chamber is rotated, the sheets move into and out of the corners and bend locally even at the interior of the bundle sufficiently to lose contact with the separators, thus permitting the finely divided coating metal to sift in between the sheets and the separators. When the sheets are wound spirally, the weight of the bundle causes the lower portions of the convolutions of the sheets and of the separators to en-

gage but the upper portions disengage and permit the coating metal to again sift in between the sheets and separators. This disengagement of the sheets and separators obviates the tendency to leave an uncoated line of contact between the separators and sheets.

I claim:—

1. The process of coating the surfaces of sheets of metal, with zinc which consists in rolling up the sheets into cylinders or spirals with separators between the convolutions, then placing these rolled up sheets into a treating chamber with finely divided zinc packed around and between them, and then heating the sheets and zinc sufficiently to deposit the zinc in metallic state.

2. The process of coating the surfaces of sheets of metal with zinc which consists in rolling the sheets into cylinders or spirals with separators between the convolutions, placing these rolled up sheets into a rotatable treating chamber with finely divided zinc packed around and between them, and then rotating the chamber and heating the sheets and zinc sufficiently to deposit the zinc in metallic state.

3. The process of coating the surfaces of sheets of metal which consists in curving the sheets and packing them into a treating chamber with a powder embodying a finely divided coating metal between them, and then heating the sheets and powder sufficiently to deposit the coating metal in metallic state.

4. The process of coating the surfaces of sheet metal which consists in rolling the sheets into cylinders or spirals with means between the convolutions to prevent them from touching each other, applying to the sheet metal a powder embodying a finely divided coating metal, and then heating the sheets and powder sufficiently to deposit the coating metal in metallic state.

MAXWELL M. WISE.