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METHOD OF REMOVING OXIDES, OILS AND GREASE FROM AN UNCOATED METAL ARTICLE

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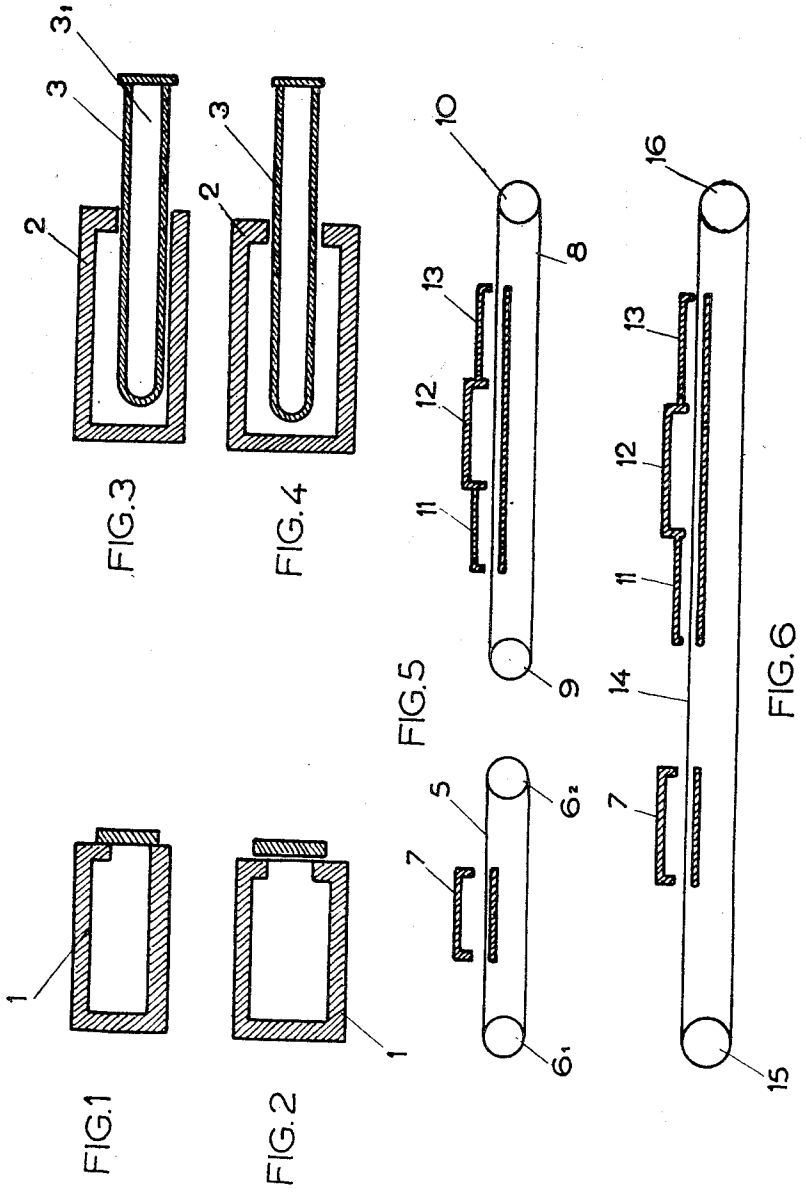


FIG.3 FIG.4 FIG.5 FIG.6

FIG.1 FIG.2

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METHOD OF REMOVING OXIDES, OILS, AND GREASE FROM AN UNCOATED METAL ARTICLE

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1 Claim. (Cl. 134—2)

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This invention relates to a method for the treatment of metallic pieces with a view to effecting any coating operation and more particularly to enamelling.

For scouring metallic pieces, for instance metal sheets, with a view to covering them with a coating such as an enamel layer an acid bath (sulphuric acid or hydrochloric acid) is used into which the pieces to be scoured are immersed.

This known method offers numerous drawbacks:

1. Acid baths emit acid vapors which are injurious for the workmen. In spite of the ventilations required by the regulations the workmen are not always protected against the dangerous action of said vapors.

2. The vats containing the acid baths must be acid-resisting. Lead covered vats the maintenance of which is easy or sandstone vats which are very expensive and fragile must be used.

The present invention has for its object to obviate said drawbacks.

The invention relates to a method for the treatment of metallic pieces with a view to a coating operation such as an enamelling operation, said method being characterized in that fats covering the pieces are first burnt off, whereafter the formed oxides are destroyed which makes it possible to scour the metallic pieces without the use of acids.

According to a form of carrying out the above mentioned method the metallic pieces to be treated are first heated in an oxidizing atmosphere in order to burn off the fats which cover said pieces, whereafter the latter are heated in a reducing atmosphere which makes it possible to destroy the oxides formed by the heating operation or existing formerly on the pieces.

The invention also covers the hereinafter described characteristic features and their various possible combinations.

Devices for carrying out the methods according to the invention are shown by way of examples in the appended drawings, in which:

Figures 1 and 2 are respectively a vertical and a horizontal sectional view of a furnace for effecting the first operation of the method.

Figure 3 and 4 are respectively a vertical and a horizontal sectional view of a furnace for effecting the second operation of the method.

Figure 5 is a sectional plan view showing a complete plant with two continuous furnaces.

Figure 6 is a longitudinal sectional view of said complete plant with a single movable hearth.

According to the invention the sheet metal

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pieces to be covered with a coating as for example enamel are treated preliminarily in the following manner:

a. In the course of a first operation the fats which cover the sheet metal pieces are burnt off. Said fats generally come from the chasing operation and their presence would prevent the coating to adhere to the metal.

Said burning operation is effected at a temperature varying with the composition of the oil which covers the sheet metal, for example between 300° and 600° C. A stationary or continuous furnace with an oxidizing atmosphere is used.

b. A second operation consists in scouring the piece in a stationary or continuous furnace in a reducing atmosphere at temperatures varying between 700° and 850° C.

This second operation has for its purpose to destroy:

a. The oxides which covered the metallic piece at the beginning of the treatment, and

b. The oxides which have formed on the surface of said piece in the course of the first burning operation.

The temperature of the furnace used for the second operation depends upon the nature of said oxides to be destroyed.

After said treatments the metallic pieces leave in a white condition and without any oil. The coating e. g. enamel, is applied directly onto their surface by the usual methods.

For carrying out the above described method or similar methods the devices which are shown diagrammatically in Figures 1 to 6 of the drawings can be used.

The first burning operation is effected in an ordinary furnace like that which is shown in Figures 1 and 2.

The scouring operation in a reducing atmosphere is effected in a furnace **2** with a muffle **3** (Figures 3 and 4). The pieces to be scoured are introduced into the first part 3^1 of the muffle which plays the part of a lock and then pushed into the opposite end or rear part of said muffle.

The furnace for effecting the first operation can also be provided with a movable hearth **5** moved by the rotation of two centre bosses 6^1, 6^2 and passing with a slow speed through a tunnel furnace **7**.

Said furnace (Figure 5) is located near a similar furnace making it possible to effect the second operation. Like the first furnace, the second furnace comprises a movable hearth **8** moved by two movable centre bosses **9**, **10** and passing with a slow speed through an inlet lock **11** in a

furnace 12 and finally in an outlet lock 13. Said locks have for its object to provide for the heating and cooling of the pieces in a controlled atmosphere.

In Figure 6 both furnaces 7 and 12 are provided with one and the same hearth 14 moved by two centre bosses 15, 16. Thus, both operations of the method are effected successively with the minimum handling.

I claim:

A method of removing oxides, oils and grease from an uncoated metal article which comprises, applying heat to the external surface only of the article in the presence of an oxidizing atmosphere to oxidize oils and grease adhering to the external surface of the article, removing the article from said heat zone before the article is heated sufficiently to alter its internal metallurgical characteristics, applying heat to the external surface only of the article in a reducing atmosphere to destroy oxides adhering to the external surface

of the article, and removing the article from the last heat zone before the article is heated sufficiently to alter its internal metallurgical characteristics.

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