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A. PODEL

METHOD AND APPARATUS FOR TREATING PLATES PRIOR TO LACQUERING OR THE LIKE

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3 Sheets—Sheet 1

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3 Sheets-Sheet 3

Inventor
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By George Mannery
his Attorney
To all whom it may concern:

Be it known that I, ABRAM PODEL, a citizen of the United States, residing at Long Island city, in the county of Queens, State of New York, have invented certain new and useful Improvements in Methods and Apparatus for Treating Plates Prior to Lacquering or the like, of which the following is a specification.

This invention relates to a method, and a machine for carrying out the method for treating sheets of metal, or the like, prior to lacquering, lithographing, or painting.

Sheets of tin or other sheet metal frequently have spots of grease or other foreign material over the surface of the sheets. This is particularly true of sheet tin because the coating of tin is usually applied to the sheets of iron or steel by dipping the untinned plates into a molten bath of tin and the sheets are usually treated with a fluxing bath prior to immersion in the molten tin, and some of this bath adheres to the finished product. Sometimes the fluxing materials are maintained over the surface of the molten tin. In any event, commercial sheets of tin metal are more or less covered with fluxing material. In many uses of tinned plates it is necessary that the plate be covered with ornamentation or with protecting lacquer. Wherever the surface of the tin is not thoroughly cleaned before it is painted, lithographed or lacquered, or the like, the applied coating is liable not to adhere to the tin over the uncleaned spots. Heretofore in the art it has been customary to clean the tin by brushing or scrubbing operations. Sometimes these operations are carried out by hand but usually are performed by suitable machines. It has been found that where the foreign matter on the sheets is of an oily nature brushing and scrubbing tends to spread the oil rather than to remove it. However, the scrubbing operation does remove dust and loosely adhering particles of a granular nature.

The present invention overcomes the difficulties of the known prior art by providing a method and machine for carrying out the method, which comprises passing the sheets of tinned metal through heating flames which locally apply intense heat to a rapidly moving tinned sheet. In the preferred embodiment of the invention the heat is applied in the form of rows of heating flames, which rows are separated so that while the entire sheet was subjected to flames during the passage through the burners, only a very small strip or area of the sheet is passing through the burner flames and sufficient space is provided between the rows of burners to permit the cooling of the sheet so that the sheet itself is not heated to an excessive degree. The intense heat of the flames on the surfaces of the sheet, however, completely incinerate or volatilize the foreign matter on the sheets. After the passing through the heating step the sheets are then subjected to a brushing or scrubbing operation which removes any particles of solid material adhering to the sheets whether in the nature of ash resulting from combustion or wholly incombustible foreign material. Thus the sheets leave the device in a thoroughly cleaned condition ready to be ornamented or lacquered as desired.

It is recognized that the disclosure in the present case shows but one embodiment of the present invention, and therefore this disclosure is to be considered as illustrative and not in the limiting sense.

Throughout the drawings and specification like parts are designated by like characters.

Figure 1 is an elevational side view of a device for carrying out the present invention and brushing and scrubbing apparatus is shown diagrammatically;

Figure 2 is a plan view of the burner table;

Figure 3 is an end elevation of the burner table;
Figure 4 is a perspective view of a sheet passing through one of the burner units and illustrates the operation of the flames upon the sheet.

Referring now to the drawings, generally, it will be noted that a burner table mechanism is illustrated more or less in detail while the cleaning and scrubbing machine is illustrated in Figure 1 diagrammatically.

The brushing and scrubbing machine while comprising one of the cleaning apparatuses adapted to perform a step in the present process, is nevertheless a machine of a standard type which may be purchased in the open market and is of such well known construction that detail illustrating is believed would be surplusage.

The present method may be carried out by hand and may be carried out by machinery, one form of which may comprise a sheet table 1 supported upon a suitable machine frame 2, and the sheet table may be provided with a guide-plate 4 which directs the sheet A between the first pair of feed rolls. The burner table is provided with two pairs of feed rolls comprising lower driven rolls 5 on a suitable shaft which is mounted in bearings 6 and are connected by sprocket chains 7 which run over sprocket wheels 8.

Upper rolls 9 are mounted upon a shaft which is guided in open bearings 10 and these upper shafts are rotated by cog wheels 11 which mesh with cog wheels 12 mounted on the shaft of the lower driven rolls 5.

The lower driven rolls 5 and the upper rolls 9 are of the same diameter and the cog wheels 11 are also the same diameter as the cog wheels 12. This arrangement causes the upper and lower rolls to have the same peripheral speed. The open bearings 10 permit the upper rolls to ride freely over sheets being fed to the machine and to drop to the lower rolls after a sheet passes. Since the upper rolls and shafts are made of iron and steel the weight of these rolls is sufficient to provide the necessary pressure to properly grip sheets passing through the machine. Other pairs of similar rolls are provided in the brushing and scrubbing machine 14 and all these pairs of rolls are so arranged, relatively to the length of a standard sheet of tinned metal, that the sheet is at all times under influence of two pairs of rolls, consequently a sheet once started through the machine proceeds automatically until all of the operations are completed.

The burner table is arranged with pairs of burners which may comprise horizontally arranged pipes 15 and 16 provided with burner openings. These pipes are connected to a main supply pipe 17 into which a suitable burning mixture of commercial gas and air is led through pipes 18 and 19. Cut-off valves 20 are provided between the main supply pipe 17 and each pair of burner pipes or tubes 15 and 16 so that any pair of burners may be cut in or out of service as desired. The burner tubes are preferably, mounted in pairs supported by brackets 21 that set on the main frame 2. Preferably, a plurality of pairs of burner pipes are arranged between the pairs of feed rolls, and in the device illustrated in Figures 1 and 2, two pairs of burner tubes are shown between the feed roll stations. Suitable supporting guides 22 are arranged to support the sheets A as the sheets progress through the device. Edge guides 24 are also provided to direct the sheets in their movement. As will be seen from Figure 4 the flames from the burner pipes 13 and 16 spread out brushwise fashion on each side of the sheet A so that intense burning flames completely cover both sides of the sheet A whereby the entire sheet is subjected to a burning flame which completely removes all the volatile and combustible matter on the surface of the sheets. Then the sheets are subjected to operation of the scrubbing and brushing machine which may be of any well known construction and comprises brushes 50 and 51 shown diagrammatically in the drawing. Any foreign material which remains on the sheets after being subjected to the flames is usually of a granular nature and is effectively removed by the operation of the scrubbing and brushing machine, thus leaving the sheets in a thoroughly clean state.

Having described my invention, what I claim is:

1. The method of treating tinned sheets, or the like, to remove deleterious material, which method comprises subjecting the surface of the sheet to a burning flame to volatilize or incinerate combustible materials on the surface of the sheet to produce granular materials, and then removing said granular materials from the sheet.

2. The method of treating tinned sheets, or the like, to remove deleterious material, which method comprises subjecting portions of the surface of the sheet to a burning flame to volatilize or incinerate combustible materials on the surface of the sheet to produce granular materials while cooling the remainder of the sheet, and then removing said granular materials from the sheet.

3. The method of removing combustible materials from the surface of tinned sheets, or the like, which method comprises subjecting the said sheets to an incinerating flame which is movable over said sheet to prevent excessive heating of the sheet and to incinerate and volatilize foreign substances on the sheet to produce dried or granular material, and then removing said dried and granular material from said sheets.

4. The method of removing combustible materials from the surface of tinned sheets, or the like, which method comprises subject...
ing said sheets to opposed incinerating flames which are movable over both sides of said sheet to prevent excessive heating of the sheet and to incinerate and volatilize foreign substances on the sheet to produce dried or granular material, and then brushing the sheet to remove said dried and granular material from said sheets.

5. The method of treating tinned sheets, or the like, for cleaning same which method comprises subjecting the entire surface of said sheet to a localized burning flame which is rapidly moved over the surface of said sheet to volatilize and incinerate foreign matter on said sheet without unduly heating said sheet to produce dried or granular material, and then removing said dried or granular material from said sheet.

6. The method of treating tinned sheets, or the like, for cleaning same which method comprises subjecting the entire surface of both sides of said sheet to localized burning flames which are rapidly moved over the surfaces of said sheet to volatilize and incinerate foreign matter on said sheet to produce dried or granular material without unduly heating said sheet, and then scrubbing the sheet to remove said dried or granular material from said sheet.

7. The method of cleaning tinned sheets or the like which method comprises providing a plurality of incinerating and volatilizing zones of gases in the state of combustion, and rapidly passing said sheets through a plurality of said zones to produce dried or granular material, and then removing the dried or granular material from the surface of the sheets.

8. A machine for treating sheets of metal or the like for cleaning, said machine comprising a plurality of feed rolls, a plurality of burner tubes arranged in the path of sheets controlled by said feed rolls, and adapted to apply a flame to substantially the entire surface of a sheet as it passes, means to supply a combustible gas to said burner tubes, and means to support said sheets between said feed rolls.

9. A machine for treating sheets of metal or the like for cleaning, said machine comprising a plurality of pairs of feed rolls, said feed rolls being so spaced that a plurality of pairs simultaneously engage a single sheet, a plurality of burner tubes arranged in the path of sheets controlled by said feed rolls and adapted to apply a flame to substantially the entire surface of a sheet as it passes, means to supply a combustible gas to said burner tubes, and means to support said sheets between said feed rolls.

10. A machine for treating sheets of metal or the like for cleaning, said machine comprising a plurality of feed rolls; a plurality of burner tubes arranged on each side of the path of sheets controlled by said feed rolls; driving devices to drive all of said rolls at the same speed, said burners being arranged to apply a flame to substantially the entire surface of a sheet as it passes; means to supply a combustible gas to said burner tubes; and means to support said sheets between said feed rolls.

11. A machine for cleaning sheets of metal or the like, said machine comprising a plurality of burner tubes arranged in pairs with the burner openings in one tube being directed toward the other tube, and means to pass sheets between said tubes and through the flames from said burner openings with the surface of the sheets substantially perpendicular to said flames, whereby the surface of said sheets is completely subjected to the flames from said burner tubes.

12. A machine for cleaning sheets of metal or the like, said machine comprising a plurality of burner tubes arranged in pairs with the burner openings in one tube being directed toward the other tube, means to pass sheets between said tubes and through the flames from said burner openings whereby said sheets are completely subjected to the flames from said burner tubes, and devices to brush said sheets after the sheets pass through the burner tubes.

13. A machine for cleaning sheets of metal or the like, said machine comprising a plurality of burner tubes arranged in pairs with the burner openings in one tube being directed toward the other tube, means to regulate a supply of combustible gas to said tubes, means to pass sheets between said tubes and through the flames from said burner openings whereby said sheets are completely subjected to the flames from said burner tubes.

14. A machine of the character specified comprising a machine frame, feed rolls mounted upon said machine frame, said feed rolls being mounted in pairs with the upper feed rolls having freedom of movement away from the lower feed rolls, a plurality of burner tubes mounted in pairs with the axes of said burner tubes being substantially parallel to the axes of said feed rolls, sheet supporting means between said pairs of feed rolls, driving means for said feed rolls, and means to supply said burner tubes with a combustible mixture of gases.

15. The method of cleaning metal sheets which comprises subjecting the surface of a sheet to a flame to carbonize and vaporize foreign matter, and then removing nonvolatile materials from the sheet.

16. The method of cleaning metal sheets which comprises heating the surface of a sheet locally to vaporize greasy foreign matter, and then removing nonvolatile materials from the sheet.

17. The method of cleaning metal sheets which comprises, subjecting the surface of a sheet locally to vaporize greasy foreign matter, and then removing nonvolatile materials from the sheet.
of a sheet to a flame to vaporize volatile foreign matter, and then removing nonvolatile foreign matter.

18. The method of cleaning the surface of metal which comprises heating the surface locally to vaporize greasy matter, and then removing nonvolatile materials from the surface.

19. The method of cleaning metal surfaces which comprises applying a flame to the surface to vaporize volatile material and then removing nonvolatile material.

20. The method of cleaning metal surfaces which comprises heating the surface locally to vaporize volatile substances, and then removing nonvolatile substances by brushing the surface.

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