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METHOD OF TREATING METAL PARTS

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My invention aims to provide improvements in the method of treating metal parts during the preparation for finishing. In the process of manufacture of small metal parts such as drawings and stampings, it is necessary to lubricate the stock as it is fed into the machines. Naturally a certain amount of the lubricant remains on the parts when they emerge from the machine in the finished state. This lubricant, which is often lard oil, or some special compound of petroleum, must be cleaned from the parts before they can be plated or lacquered. The most advantageous time to clean the parts is directly after they leave the machine.

One of the best known and most efficient cleaning methods is to wash the parts in trichlorethylene, a solvent of organic composition which is marketed under a variety of trade names. I have found that trichlorethylene is such an efficient solvent that metal parts, especially those made of steel, are so clean that they begin to rust or corrode immediately the solvent dries and they are exposed to atmosphere of more than usual humidity. Obviously this is an undesirable result of any cleaning process, for in certain industries there is often a rather lengthy period between the cleaning and plating or lacquering processes.

It is the object of my invention to provide a process whereby the metal may be degreased and protected from rust at the same time. Obviously the solvent or degreaser must be used whatever the process, and I have therefore started with the cleaner as a foundation. The best method of preventing rust or corrosion of metal is to cover it with a protective film of some moisture resisting material. In the case of small parts, the film must be tough and durable as well as moisture-resisting, since it must undergo severe treatment in handling and shipping. I have found that certain resins and oils, soluble in the organic solvents will dry evenly and quickly on the metal as soon as the solvent has evaporated, thereby forming a thin rust-proof film.

While there are several available resins which are wholly or partially soluble in trichlorethylene, I prefer to use common rosin, both because of its low price and because of the ease with which it may be dissolved in the degreasing solvent. Furthermore, I have found that although many resins appear to be completely dissolved in trichlorethylene they form small globules on the metal as soon as the solvent has evaporated instead of forming a covering film. Rosin, on the other hand, invariably dries and hardens in a smooth even film. Such a film may be obtained by dissolving in trichlorethylene from two to four ounces of rosin per gallon of solvent.

In order to provide a tougher and more durable film, I add to the dissolved rosin a certain amount of a vegetable oil such as boiled linseed oil.

The linseed oil adds elasticity to the film and prevents the rosin from drying out and becoming brittle. A solution may be made at room temperature and used with great success without heating. I have found it advisable to use three tanks of solvent, to be used in series. The last one contains the rosin and linseed oil, while the first two insure a thorough cleaning.

The film obtained by my novel process may be used as a priming coat for subsequently applied baked finishes, or it may be cleaned off in the hot caustic solutions which are normally used just prior to lacquering or plating.

It is to be understood that my method of cleaning and protecting metal is not exclusively useful for small metal parts, but is adapted to preserving unfinished metal in other forms as well.

I have found that rosin and linseed oil, either separately or together, leave a very uniform film over the part when dipped and dried. The solvent dries out rapidly and the resultant film does not pull together into islands or bunches. However, a film of rosin alone deteriorates rapidly when exposed to air and becomes crumbly, porous, powdery and brittle. The addition of linseed oil strengthens the film, makes it non-hygroscopic, prevents oxidation of the film, keeps the film transparent and makes the film permanent, all without deleterious effect.

If too much boiled linseed oil is used, the resultant film does not dry very quickly and, therefore, I have found the best formula to contain about 1 gallon trichlorethylene, 4.5 ounces rosin by weight and 1 ounce boiled linseed oil by weight. Heavier concentrations can be used, but the ratio of rosin to oil should be about 4 to 1 for best results.

While I have described a particular combination of materials by the use of which my invention may be carried out, I do not wish to be limited by such description, as the scope of my invention is best defined by the following claims.

I claim:

1. The method of cleaning and protecting metal which comprises subjecting the metal to be cleaned to a solution containing rosin, vegetable oil and trichlorethylene and subsequently allowing the trichlorethylene to evaporate thereby

leaving a protective coating of the rosin and oil on the metal.

2. The method of cleaning and protecting metal which comprises subjecting the metal to be cleaned to a solution containing parts of rosin and linseed oil in trichlorethylene and subsequently allowing the trichlorethylene to evaporate thereby leaving a protective coating of the rosin and oil on the metal.

3. The method of cleaning and protecting metal which comprises subjecting the metal to be cleaned to a solution containing about 97.5% trichlorethylene, about 2% rosin and about .5% boiled linseed oil by weight and subsequently allowing the trichlorethylene to evaporate and leave a protective moisture-proof coating of rosin and oil on the metal.

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