Patented Oct. 11, 1932 1,882,567

UNITED STATES PATENT OFFICE

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SOLDERING FLUX

No Drawing. Application filed December 17, 1930. Serial No. 502,991.

This invention relates to the art of soldering and is directed to a soldering flux, particularly to a flux in paste-like form, used for soldering sheet steel and other metals with lead-tin solder.

Paste type flux has the advantage over liquid type flux in that it does not "run" and can therefore be confined to the desired spot. Heretofore, however, the liquid flux has been more generally used because of its better fluxing qualities.

The objects of this invention are to improve the fluxing qualities of paste type fluxes; to provide a self cleaning flux; to reduce the cost of soldering; to simplify the operation of soldering with paste type flux and to generally improve the art of soldering.

Generally stated the invention consists of a soldering flux which is an admixture of a continuous phase and a dispersed phase. The continuous phase may consist solely of an emulsifying agent or it may in addition comprise a vehicle; a dispersed phase may in addition comprise a fluxing agent.

The metal etching acid may be almost any mineral acid or any non-oxidizing acid which is adapted to etch the metal being soldered, such as sulphuric, phosphoric, lactic or the halogen acids. I prefer hydrochloric acid.

The fluxing agent may be a variety of substances of which abietic acid (rosin), beeswax, and the halides such as tin choride, analine hydrochloride, lithium bromide and zinc chloride, are well known. Of these, zinc chloride, due to its qualities and its commercial availability, is the most effective and economical.

The vehicle may be any suitable diluent for the emulsifying agent such as a variety of substances which may include, starch paste; various vegetable, mineral and animal oils, such as castor oil, mineral lubricating oil or whale oil; certain greases, like tallow, lard or petrolatum; waxes, such as paraffin, japan, china, and carnauba. Of all these substances I prefer to use petrolatum because it is inexpensive and produces excellent results.

Certain of the metal etching acids may be used at the same time as the fluxing agent. Thus, when hydrochloric acid, phosphoric acid or lactic acid is used, the fluxing agent per se may be omitted. However, I have noted that better results are obtained if the fluxing agent per se is present.

The vehicle may also play two parts by also acting as the fluxing agent, thus, abietic acid, stearic acid and tallow may be used in this way, but I have found in this case also the quality of my flux is better when the vehicle does not have to act in two capacities.

To make the emulsion of my metal etching acid, I may mix the acid with an emulsifying agent. As lanum produces satisfactory results and is easily obtained, I prefer it.

A suitable emulsion to practice my invention may be made by admixing:

Lanum	10.710 pounds
Hydrochloric acid (20° Bé.)	1.233 gallons

The lanum constitutes the continuous phase and the hydrochloric acid, the dispersed phase.

This forms a stiff paste, and may without further additions be used as a soldering flux with more or less success, as the hydrochloric acid not only cleans the metal but also acts as a fluxing agent. The quality of the paste, however, may be improved by the addition of the fluxing agent, which is best introduced as an aqueous solution. When my preferred fluxing agent, zinc chloride, is used, I dissolve it in water to make a 70% solution and add 1.028 gallons of it to the above admixture which I incorporated by constant stirring. Such an admixture has strong fluxing properties but is too stiff for quick manipulation and often does not properly adhere to the surface to be soldered and hence should be diluted with a vehicle. The amount of vehicle used depends on personal judgements and requirements; I prefer to dilute the above admixture with 46.120 pounds of petrolatum, to form an admixture of the following composition:

Lanum	10.710 pounds
Hydrochloric acid (20° Bé.)	1.233 gallons
Zinc chloride (70% solution)	1.028 gallons
Petrolatum	46.120 pounds

In this composition, the lanum and the

petrolatum constitute the continuous phase and the zinc chloride and the hydrochloric acid constitute the dispersed phase.

The amount of each ingredient may be varied over a wide range so long as this phase relationship is maintained, otherwise a separation of the composition may result to the great deteriment of its fluxing properties.

My soldering flux is used in the usual manner. It is applied with the finger, a brush, a rod or a swab, to the metal to be soldered. The solder is then applied with the usual heated "iron" or the metal is heated with a torch or flame and the solder melted on, from a rod or wire.

The advantages of my flux are especially noticeable where the metal to be soldered is covered with a thin film of oxide. Heretofore it has been necessary to remove the film of oxide as a separate operation before applying the soldering flux; when my flux is used this pre-cleaning operation may be dispensed with, as the emulsified acid is adapted to dissolve this oxide film, and hence the soldering can be accomplished quicker and with less labor.

I do not intend to be limited in the practice of my invention save as the scope of the prior art and of the attached claims may require.

I claim:

1. A soldering flux paste being an admixture of a continuous phase comprising lanum as an emulsifying agent and a dispersed phase comprising a metal etching acid.

2. A soldering flux paste being an admixture of a continuous phase comprising lanum and a dispersed phase comprising a metal etching acid and a fluxing agent.

3. A soldering flux paste being an admixture of a continuous phase comprising lanum and a dispersed phase comprising hydrochloric acid and a fluxing agent.

4. A soldering flux paste being an admixture of a continuous phase comprising lanum and a dispersed phase comprising hydrochloric acid and zinc chloride.

5. A soldering flux paste being an admixture of a continuous phase comprising lanum and a vehicle and a dispersed phase comprising a metal etching acid.

6. A soldering flux paste being an admixture of a continuous phase comprising lanum and petrolatum, and a dispersed phase comprising a metal etching acid.

7. A soldering flux paste being an admixture of a continuous phase comprising lanum and petrolatum and a dispersed phase comprising hydrochloric acid and zinc chloride.

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