

UNITED STATES PATENT OFFICE.

SILVIO GARBARINO, OF GENOA, ITALY, ASSIGNOR TO CARLO DENEGRI, OF GENOA, ITALY, AND MARIO GIANNONI, OF NEW YORK, N. Y.

COMPOSITION AND METHOD OF CLEANING CONDENSERS AND THE LIKE.

No Drawing.

Application filed February 16, 1924. Serial No. 693,385.

To all whom it may concern:

Be it known that I, SILVIO GARBARINO, subject of the King of Italy, residing at Genoa, Italy, have invented certain new and useful Improvements in and Relating to the Composition and Methods of Cleaning Condensers and the like, of which the following is a specification.

This invention relates to a suitable process to be adopted for obtaining prompt and efficient cleaning of steam engine condensers, automobile or boat radiators, circulating chambers of the gas, benzine Diesel motors, etc., cooling serpentine of any type and, in general, for the cleaning of piping systems or steam chambers or the like which during the working of the motor are subjected to the incrustation by calcareous materials or to the dirtying by other materials, especially by greases, which are deposited by the cooling water or by the steam or gas during their passage.

At the present time the cleaning is operated by removing the piping systems or other installations, then cleaning, and setting the same up again; and for this purpose tanks are used in which the pipes or the other parts to be cleaned are left for a time under the action of suitable acids more or less diluted.

This obviously presents many disadvantages.

The present invention has for its object to eliminate all the disadvantages, and this owing to the fact that the piping systems or other devices to be cleaned are left in place during the cleaning operation, the said cleaning being operated on the incrustating substances by means of appropriate liquids having a special composition and which do not corrode the various devices; thus obtaining the advantage of executing a complete cleaning of the condenser or other device during a short time (generally not over thirty-six hours).

The process of my invention is as follows:

1. The condenser and radiators or cooling tanks are emptied completely, and the circulating water is prevented from returning thereinto, during the cleaning operation.

2. The condenser, radiators, pipes, etc., are then filled from the water inlet side with the cleaning liquid described below. The filling is made to a level, say, five centimeters above the uppermost pipes; Diesel chambers

and other piping systems to be cleaned are similarly treated.

3. The said liquid is left to act for from six to twelve hours, or up to twenty hours, according to the thickness of the layer to be removed.

4. The condenser or other device is then emptied of the incrustation-removing liquid, this latter being preserved, and by means of a pump which may also be that used for circulating the condensing liquid, an energetic washing is conducted for half an hour or so.

5. In removal of deposited grease, the condenser, or the chamber or other device is first filled from the steam inlet with the used liquid remaining from the preceding operation, and which therefore also contains the salts produced by dissolving the incrustations, each 100 kgs. of said liquid being reinforced with the following: Hot water 25 kilograms, copper sulphate 5 kilograms.

6. The whole is then heated to 80-85° C. for about five hours, which is then withdrawn.

The liquid mentioned in the preceding paragraph 2, may consist of the following: Water 86.500 kgs., acid (preferably hydrochloric although sulphuric could be used) 12 kgs., copper salt preferably copper sulphate 1 kg. This latter material prevents injury to the iron, by the acid present. Watery solution of 1 part sodium salt (preferably sulphate or bisulphite) to 3 parts of water 0.500 kgs., total 100 kgs.

7. It is then emptied and is given a thorough washing with water, say for about half an hour.

Without limiting the invention to all the above details, which are given by way of illustration, I claim:—

1. A liquid composition of matter for use as a decrustant for cleaning condensers, radiators and the like formed from a mixture of:

	Parts by weight
Water	86.5
Hydrochloric acid	12.0
Copper sulphate	1.0
25% solution of sodium sulphate	0.5

2. A process for removal of incrustations and grease deposits in condensers, radiators and the like which comprises filling the devices without disassembling same with a solution of the kind of that according to claim

1 and allowing the same to set for several hours, then withdrawing the solution, thoroughly washing the parts thus freed from the incrustation and separately there-
s from introducing into contact with the parts to be freed from grease a solution which has served for the deincrustation reinforced by the addition thereto of a copper salt, heating the said liquid to a temperature a little below the boiling point for several 10 hours, drawing off such solution and washing the device completely.

SILVIO GARBARINO.