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" Improved process for soak cleaning of steel  
surfaces of articles contaminated with oil "

Council of Scientific & Industrial Research, Rafi Marg,  
New Delhi-1, India, an Indian registered body incorporated  
under the Registration of Societies Act, (Act XXI of 1860).

The following specification particularly describes  
and ascertains the nature of this invention and the manner  
in which it is to be performed :-

This is an invention by Kumattithidal Santhanam  
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PRICE : TWO RUPEES

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This invention relates to improvements in or relating to the process for soak cleaning of steel <sup>surfaces & articles</sup> contaminated with oil.

Soak cleaning process based on use of alkaline inorganic compounds are known.

The known processes based on alkaline inorganic compounds (with or without wetting agents) do not completely remove different types of mineral oils which are applied to ferrous surfaces for protection during transit and storage.

The object of this invention is to develop a soak cleaning process based on the use of alkaline inorganic compounds and wetting agents which removes all types of mineral oils, vegetable oils and greases which may be applied to ferrous surfaces for corrosion protection during transit and storage.

The main finding of the invention is that the ratios of different alkaline compounds to be used for soak cleaning and the choice of wetting agent are specific and only certain ratios of alkaline compounds and specific wetting agents and a suitable combination of the two give the desired result.

The result is that all types of mineral oils, vegetable oils, greases available in the market and used as base for rust preventing oil are completely removed by the new formulations.

The invention broadly consists of a process using a bath containing sodium hydroxide in the range of 40-65 per cent but preferably in the range of 50-60 per cent, sodium carbonate in the range of ~~0-5~~<sup>4-5</sup> 50 per cent but preferably in the range of ~~0-5~~<sup>4-5</sup> 40 per cent, Trisodium phosphate in the range of 5-50 per cent

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but preferably in the range of 8-40 per cent, sodium lauryl sulphate in the range of 1-5 per cent but preferably in the range of 2-3 per cent and dissolving the mixture in water to get a concentration of 50-100 grams per litre but preferably in the range of 50-75 grams per litre and heating the bath to a temperature of  $95 \pm 5^{\circ}\text{C}$ . and soak cleaning for a period of 10 to 15 minutes. Typical compositions are given in Table.

No.	Constituents	Percentage concentration of the formulation
1	Sodium hydroxide	58
	Sodium Carbonate	1.5
	Trisodium phosphate	38
	Sodium lauryl sulphate	3
2	Sodium hydroxide	53
	Sodium carbonate	36
	Trisodium phosphate	9
	Sodium lauryl sulphate	2

The soak cleaning process comprises dissolving the constituents of the bath in water in mild steel container and the temperature is raised to  $95 \pm 5^{\circ}\text{C}$  by immersion heaters or by steam heating. Items mounted on jigs are immersed in the hot solution for a period of 10-15 minutes depending upon the degree of contamination by oil or grease on the metal surface. The item is removed, rinsed and tested for water break during removal from the rinsing bath. There should be no water break. After removal, water is sprayed on the cleaned surface with the

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help of a hand operated atomizer. There should be no droplet formation on the metal surface during spraying, if it is completely cleaned.

#### Example I

50 gms of degreasing composition as mentioned in (1) of table is taken and dissolved in a litre of water and this solution is taken in a glass beaker and heated to  $95^{\circ}\text{C} \pm 5^{\circ}\text{C}$ . Both rusted and polished mild steel plates of size 7.5 x 5 cms carrying a layer of mineral oil, vegetable oil or castrolase grease are kept hung inside for 10 minutes. The plates are removed and degreasing efficiency for producing oil free surface is tested for water break and again tested for cleanliness by atomiser test. A clean surface was obtained.

#### Example II

50 grams of the degreasing formulation as mentioned in (2) of table, dissolved per litre of water is taken in a 200 litres mild steel square tank, fitted with immersion heaters at all the four corners. The bath is heated to  $90^{\circ}\text{C}$ . Three mild steel plates of size 60 cm x 20 cm rusted, polished and carrying millscale are taken and castrolase grease, vegetable oil, or mineral oil is applied over each plate. The oiled or greased plates are mounted on a jig made of mild steel and kept immersed completely in the hot degreasing solution for 15 minutes. The treated plates are taken out and the degreasing efficiency for producing oil free surface is tested by water break and again tested for cleanliness by atomizer test. A clean surface is obtained.

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Advantages:

- 1) Effective removal of different types of oils including greases is ensured.
- 2) Cost of degreasing by using the soak cleaning formulation is less than vapour degreasing by trichloroethylene.

We Claim:-

- 1) Improved process for soak cleaning of steel surfaces of articles contaminated with oil and grease comprises soaking the same for period of 10-15 minutes in a soaking bath, prepared by dissolving 40-65 per cent of sodium hydroxide 0.5-50 per cent of sodium carbonate, 5-50 % of trisodium phosphate, 1-5 per cent of sodium lauryl sulphate in water to obtain a concentration of 50-100 grams per litre, heating the bath to 90-100°C., and thereafter spray cleaning the treated surfaces with water.
- 2) The process as claimed in claim 1 wherein the soaking bath comprises 50-60% of sodium hydroxide, 1-40% of sodium carbonate, 8-40% of trisodium phosphate and 2-3 per cent of sodium lauryl sulphate dissolved in water to obtain a concentration of 50-75 grams per litre and heating the bath to 95°C.

Dated this 9th day of June, 1975.

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