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(54) **Metal cleaning composition.**

(57) Compositions for, and a method of, cleaning a tarnished metal surface, particularly silver, the cleaning composition comprising a metal powder, preferably aluminium, together with a base and, optionally, a surfactant. The method of cleaning tarnished metal comprises the application of, or the immersion in, an aqueous solution of the cleaning composition.

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The present invention relates to a composition for and a method of removing dirt and tarnish film from metals, and especially from silver.

The appearance of tarnish film on silver goods, such as cutlery and jewellery, is unsightly, and consequently regular attention to such goods is necessary to maintain the non-tarnished appearance of the goods.

Cleaning compositions for silver, such as abrasive polishes and silver dips, are known, but are either time
10 consuming in use, suffer from other disadvantages such as damage to the metal surface from the abrasive or their possible detrimental effect on other metals.

It is an object of the present invention to provide a composition suitable for the cleaning of metals, such as silver and gold, which is inexpensive to manufacture, efficient in its operation and simple to use.

According to the present invention there is provided a cleaning composition comprising a metal powder together with a base and, optionally, a surfactant.

20 Preferably, the metal powder is aluminium powder, although the powder of any metal which is soluble in alkaline conditions with the evolution of hydrogen, and which is capable of reducing the cations of heavy metals - such as silver - to the metallic state, should suffice.

The base is preferably Trisodium Phosphate (TSP), $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$ or $\text{Na}_3\text{PO}_4 \cdot 8\text{H}_2\text{O}$, which is freely soluble in hot water. Aqueous solutions of TSP are strongly alkaline, with a 1% aqueous solution having a pH of 11.9. Commercial grade TSP sometimes yields a more alkaline
30 solution due to the use of excess alkali in manufacture to prevent caking of the crystals.

The surfactant or wetting agent is normally selected from conventional surfactants used in the detergent making art, such as soaps and sulphated or sulphonated synthetic detergents.

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The metal powder is normally present in an amount of from 0.5 to 10% by weight of the composition, and the surface active agent is normally present in an amount of from 0.5 to 15% by weight of the composition.

A preferred composition in accordance with the present invention comprises:

TSP	95 gms
Surfactant	3 gms
Al powder	2 gms

- 10 The tarnish on silver is silver sulphide Ag_2S resulting from the interaction of the Ag metal with sulphurous compounds in the atmosphere, such as Hydrogen Sulphide H_2S .

- To clean tarnished metal with compositions according to the present invention, 100 gms of the composition can be dissolved in two litres of hot water and the articles to be cleaned immersed in the solution for about 5 to 10 minutes, depending on the degree of the tarnish. The articles are then removed from the solution, rinsed and
20 dried. The solution as described above will remain active for about 20 minutes and is suitable for cleaning at least 50 pieces of cutlery, jewellery, and the like.

The solution will clean heavily decorated silver as easily as plain silver. Small trinkets that are normally hard to handle are cleaned efficiently and effectively; when removed from solution they are simply rinsed and dried. The silver is effectively cleaned without the need for polishing i.e. there is none of the mess and time consuming labour required with conventional polishing compositions.

- 30 The cleaning composition is safe to handle and will not affect the metal being cleaned. The hydrogen created acts only on the sulphide tarnish layer and has no effect on the metal, even if the metal articles are left in solution for an extended period.

The cleaning composition according to the present

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invention is preferably packaged, in powder form in a sachet, ready for use by dissolving in water. In aqueous solution the aluminium powder is dissolved with the release of hydrogen gas bubbles. The hydrogen gas interacts with the sulphide film on the silver goods which dissolves the sulphide layer. There is possibly some formation of Aluminium Sulphide Al_2S_3 but this is not stable and decomposes in the aqueous solution.

10 The surfactant acts in solution to remove any grease and dirt from the articles to be cleaned, thus allowing the hydrogen to interact with the sulphide film.

Although the invention has been described above with reference to preferred embodiments and examples, it will be appreciated that numerous variations, modifications or alternatives may be substituted for specifically described features, without departing from the spirit or scope of the invention as broadly described.

What we claim is:

1. A cleaning composition comprising an alkali-soluble metal and a base.
2. A cleaning composition according to claim 1, wherein the alkali-soluble metal is a powder.
3. A cleaning composition according to claim 2, wherein the alkali-soluble metal powder is aluminium powder.
4. A cleaning composition according to any one of the preceding claims, wherein the base is Trisodium Phosphate.
5. A cleaning composition according to any one of the preceding claims, additionally comprising a surfactant.
6. A cleaning composition according to claim 5, wherein the surfactant is selected from the group comprising soaps, sulphated synthetic detergents and sulphonated synthetic detergents.
7. A cleaning composition comprising from about 0.5 to about 10% by weight of an alkali-soluble metal, from about 0.5 to about 15% by weight of surfactant, and a base.
8. A cleaning composition according to claim 7, wherein the alkali-soluble metal is aluminium powder.
9. A cleaning composition according to claim 7 or claim 8, wherein the base is Trisodium Phosphate.
10. A method of cleaning a tarnished metal surface comprising treating said surface with an aqueous solution of an alkali-soluble metal and a base.



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<u>AT - B - 63 365</u> (A. ROSENBERG) + Totality + --	1-3,8, 10	C 23 G 1/14 C 23 G 1/20
	<u>DE - A - 1 932 337</u> (BM-CHEMIE BACKENKÖHLER & VON MINDEN) + Claims + --	1,4,9, 10	
	<u>CH - A - 48 976</u> (A.M. KOHLER) + Claims + ----	1,10	TECHNICAL FIELDS SEARCHED (Int. Cl.)
			C 23 G
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
X	The present search report has been drawn up for all claims		&: member of the same patent family, corresponding document
Place of search VIENNA		Date of completion of the search 30-06-1981	Examiner SLAMA