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ABRASIVE LIME BAR

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1 Claim. (Cl. 51—304)

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This invention relates to abrasive compositions and is more particularly concerned with a composition for buffing metallic surfaces, such as nickel, nickel alloys, copper, brass, zinc and aluminum.

Conventional buffing bars now in use for buffing nickel and nickel alloys, for example, have proven unsatisfactory in many respects. Such bars ordinarily contain lime and are known as "lime bars" or "nickel rouge."

These compositions must be shielded against normal atmospheric conditions from the time they are made and throughout their use to avoid disintegration. To that end they are usually packed in sealed containers such as cans or cardboard tubes until they are ready to be used, and should only a portion of a bar be used, the unused portion must be resealed or otherwise protected. If this practice is not followed the bars lose their coherence and crumble into small pieces and will therefore become unfit for use, sooner or later, depending on the relative humidity in the atmosphere. Thus, bars of this type require care in use to avoid unnecessary waste, and considering the operations in which they are used, it is apparent that they often do not either receive the required attention, or if they do receive such care and attention, the increased cost of handling must be added to the initial cost of preparation and packaging. Therefore, from the standpoint of composition, preparation for use, and actual use, bars now generally available are a costly factor in buffing operations.

An object of the present invention is the provision of a stabilized lime or rouge composition which is not subject to rapid deterioration. One of the outstanding characteristics of this material, outside of its performance, is that it is stabilized to the extent that very little slaking will take place under normal atmospheric conditions.

A further object of the invention is the provision of a bar involving a blend of abrasive with other materials, which blend is so balanced as to bring out the maximum performance and effectiveness of the extremely fine particle sizes of the abrasive resulting in producing an unusually high color on the metal surface, free from scratches and cloudy surface film.

A still further object of the invention is the provision of such a bar which is inexpensive to manufacture and handle and which is less costly in form and use than other bars designed for similar purposes.

In general, the composition of this invention comprises the combination of lime and guanidine. The lime is preferably unslaked. Best results have been obtained by the use of Vienna lime or calcined dolomite which, in addition to calcium, also has a high magnesium content.

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The guanidine is in the form of an organic soap, such as, guanidine butyrate, guanidine laurate, guanidine myristate, guanidine palmitate, guanidine stearate, guanidine oleate, guanidine linoleate, guanidine linolineate and other soaps of the guanidine series.

Suitable methods of preparing the guanidine soaps are as follows:

1. By first preparing free guanidine in solution and then a subsequent reaction with the appropriate acid as indicated in the following equation:

$$(H_2N-\overset{NH}{\overset{\|}{C}}-NH_2)_2.H_2CO_3 + Ca(OH)_2 \longrightarrow 2H_2N-\overset{NH}{\overset{\|}{C}}-NH_2 + CaCO_3 + 2H_2O$$

$$H_2N-\overset{NH}{\overset{\|}{C}}-NH_2 + HX \longrightarrow H_2N-C-NH_2.HX$$

HX equals appropriate acid.

2. By reacting guanidine carbonate directly with the fatty acids-double decomposition:

$$(H_2N-\overset{NH}{\overset{\|}{C}}-NH_2)_2.H_2CO_3 + 2HX \longrightarrow 2H_2N-\overset{NH}{\overset{\|}{C}}-NH_2.HX + H_2O$$

HX equals appropriate acid.

While either of the above methods may be used, we prefer to react the guanidine carbonate directly with the fatty acids.

There are also other guanidine salts which are available such as guanidine nitrate, guanidine hydrochloride and phenylguanidine carbonate. However, the guanidine carbonate is best suited because of price, availability and because it is most satisfactory from a reaction standpoint.

A practical method of preparing the guanidine soaps and one which is relatively inexpensive, comprises reacting a guanidine salt, such as guanidine carbonate, with suitable acids of the type mentioned or with materials containing them. A cheap source of material for such acids is generally known as tank bottoms and consists of the residue of the distillation process for the production of stearic acids from fats and oils. Such tank bottoms contain a variety of suitable acids and the resulting composition after the reaction contains a number of different guanidine soaps.

In addition to the lime and guanidine, other ingredients may be added, such as a fracturable or a non-fracturable abrasive or both; such as tripoli, emery, Carborundum, etc. A preferred added abrasive comprises a mineral conglomerate in finely divided form described in a copending application for patent, Serial No. 46,563 filed August 27, 1948, now Patent Number 2,529,722.

The following examples will illustrate this invention and the manner in which it may be practiced, but it is to be understood that these examples are not given by way of limitation.

Example 1

About 77% stearic acid, 21% scale wax and 2% guanidine carbonate, by weight, are intimately mixed and heated which results in the production of guanidine stearate. When the reaction is completed, the resulting base material while hot is mixed with Vienna lime and an added mineral abrasive in finely divided form in the following approximate proportions, by weight:

	Parts
Base material	24
Vienna lime	57
Added mineral abrasive	19
	100

The resulting product is formed by molding or casting into bars and permitted to cool. The bars are of the dry type, that is, non-greasy and are particularly suitable for developing high color on nickel surfaces. As a matter of fact, this composition provides an extremely dry bar which is useful where a minimum of cutting is required and a maximum color with a surface free from film is desired. It does not load up recesses nor cut through sharp corners of the work.

Example 2

A base composition is first prepared as follows:

Material	Percent by Weight
Stearic acid	40
Tank bottoms	40
Tallow	12
Petrolatum	6
Guanidine carbonate	2
Total	100

This mixture is heated to react the guanidine carbonate with the stearic acid and tank bottoms to produce guanidine soaps. While hot, there is added to the base composition Vienna lime and a mineral abrasive in finely divided form in the following proportions:

	Parts
Base material	25
Vienna lime	56
Mineral abrasive	19
	100

The resulting product is molded or cast into bars and permitted to harden by cooling. Bars of this type are slightly greasy and produce high color and higher cutting than the bar of Example 1. This bar is outstanding for use on general nickel work, and being somewhat greasy and fast cutting, it is particularly useful on automobile

bumpers, furniture tubing, plumbing fixtures and iron sole plates. It develops excellent color leaving a minimum surface film which is readily removed by the simplest of cleaning cycles.

Example 3

Same as Example 1, except the base material, Vienna lime and mineral abrasive are compounded in the approximate following proportions, by weight:

	Parts
Base material	24
Vienna lime	19
Mineral abrasive	57
	100

Bars of this type are particularly suitable for coloring and cutting brass, zinc and aluminum surfaces. This bar is probably the dryest nonferrous composition ever offered to the metal finisher, although it will not burn nor drag under severe service conditions. It produces extremely high luster on copper, brass and zinc base die castings. This composition should be used where ultra-high color coupled with maximum cleanability is desired. The bar offers interesting possibilities as an inexpensive rouge for precious metal coloring and should be considered for this purpose.

Example 4

Same as Example 2, except that the base material, Vienna lime and mineral abrasive are compounded in the following approximate proportions, by weight:

	Parts
Base material	25
Vienna lime	19
Mineral abrasive	56
	100

Bars of this type are slightly greasy and are useful for producing high color and cutting on copper, brass, zinc and aluminum surfaces. This bar is a general purpose cut and color composition possessing more cut, more color and better cleanability than the tripoli base materials so widely employed by the trade. It has a slightly greasier base and more cut than the bar of Example 3. It can be applied successfully with the standard spiral sewed, pocket type or bias buffs now used for this purpose.

We claim:

A slake resistant abrasive lime bar, comprising, about 57 to 19 parts Vienna lime combined with a mineral abrasive in finely divided form to total about 76 parts, uniformly distributed in about 24 parts of a base consisting of about 79 per cent guanidine soap and 21 per cent wax.

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