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ANTI-SLAKING BUFFING COMPOSITIONS

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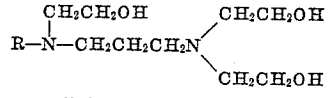
This invention relates to improved buffing compositions. In one of its aspects, this invention relates to lime buffing bars having improved anti-slaking properties.

Conventional buffing compositions in use for buffing nickel, nickel alloys, copper, brass, zinc, aluminum, etc., have proven unsatisfactory in many respects. Such compositions usually contain lime and are used in the form of bars. In use these bars are rubbed against the buffing wheel and the abrasive applied to the wheel by melting the binder brought about by the heat of friction.

The production of lime compositions has caused problems in the buffing industry for years. An insoluble lime soap is often formed when mixing the calcium and magnesium oxides and the fatty acid binder in the presence of moisture. When this occurs in the kettle it is necessary to break the hard cellular soap into pieces that can be easily removed, since heat will only char the soap, not melt it. In addition to soap formation, the most pressing problem from a consumer point of view is slaking. This term is used to describe the hydration of the hard oxides to the soft hydroxides in the presence of atmospheric moisture and normally takes place within one to three weeks after formation of the lime bar unless an airtight container is used for storage of the compound. As hydration occurs the slaked lime reacts with the fatty acid binder and the bar flakes and eventually crumbles. In this condition, of course, it cannot be used in buffing operations. The industry has circumvented the problem somewhat by the use of quality controlled materials, close supervision in manufacture, and the use of expensive airtight containers similar to the vacuum sealed food containers. However, even with these precautions, storage of lime bars for any length of time is not practiced and orders are filled only when received. It is obvious, therefore, that there exists a need for an anti-slaking additive in lime buffing compositions.

In accordance with the present invention we have provided an anti-slaking additive for lime buffing compositions which enables buffing bar compounders to produce bars for stock, which they have been unable to do before because of the short storage life. This makes possible easier production scheduling and the preparation of larger sized batches. Also, it enables the use of a cheap paper container in place of an expensive airtight metal container or foil.

Our anti-slaking additives are N-aliphatic-N,N',N'-tris-(hydroxyethyl) trimethylene diamines and can be represented by the structural formula



wherein R is an aliphatic hydrocarbon radical containing from 8 to 22 carbon atoms. Examples of aliphatic hydrocarbon radicals coming within the definition of R include octyl, decyl, dodecyl, tetradecyl, hexadecyl, octadecyl, octadecenyl, octadecadienyl, octadecatrienyl, and statistical mixtures of the foregoing radicals as are contained in naturally occurring oils and fats such as tallow, soybean oil, coconut oil, and the like. The mixture of aliphatic hydrocarbon radicals contained in tallow is comprised of approximately 45% by weight of octadecenyl, 25% octadecyl, and 30% hexadecyl radicals. Examples of preferred anti-slaking additives include N-tallow-N,N',-N'-tris(hydroxyethyl)trimethylene diamine, N-octadecyl-N,N',N'-tris(hydroxyethyl)trimethylene diamine and N-hexadecyl - N,N',N' - tris(hydroxyethyl)trimethylene diamine.

The improved anti-slaking lime buffing compositions of the present invention contain from about 65 to 80% by weight of lime, such Vienna lime, as the abrasive element, from about 12 to 18% of a saturated fatty acid having a titer of at least 40° C., preferably having an iodine value not in excess of 7.0, from about 12 to 18% of an animal or vegetable oil glyceride, and from about 1.5 to about 5.0%, preferably about 3.0% of our anti-slaking additive as described above. If desired, the abrasive element may contain in addition to the lime materials such as emery, silicon carbide, tripoli, or the like.

The buffing compositions of the present invention can be prepared by blending together the anti-slaking additive, saturated fatty acid, and animal oil at a temperature of about 190° F. after which the abrasive material is added in small increments to the molten material with mixing until a smooth mixture is obtained. The molten paste can then be put into forms and allowed to cool and harden.

The following example will illustrate this invention and the manner in which it may be practiced, but it is to be understood that this example is not to be construed as unduly limiting:

EXAMPLE

A series of buffing bars having the compositions by weight designated in Table I were prepared and observed for slaking. These bars were prepared by blending together at a temperature of about 190° F. the stearic acid, prime tallow or acidless tallow oil as indicated, and the N - tallow - N,N',N' - tris(hydroxyethyl) - trimethylene, also as indicated. The lime was then added in small increments to the molten mixture, keeping the total mixture of approximately 190° F., and was blended until smooth. The molten mixture was then placed in appropriate molds and the surface troweled and tamped smooth to remove bumps and blisters. When the bars were cool and hard they were removed from the molds, placed in storage and observed daily for slaking.

Table I

Bar	Percent lime [a]	Percent acidless tallow	Percent stearic acid [b]	Percent prime tallow	Percent additive [c]	Initial slaking, days	Complete slaking, days
A	77	6.9	16.1			9	49
B	77	5.9	14.1		3.0	None	[d]
C	77		16.1	6.9		8	45
D	77		14.1	5.9	3.0	31	[d]
E	77	6.9	16.1			8	45
F	77	5.9	14.1		3.0	31	[d]

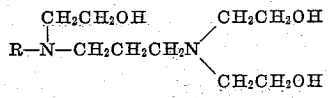
[a] Lime=50% CaO, 50% MgO.
[b] Titer=54° C.; iodine value=7.
[c] N-tallow-N,N',N'-tris (hydroxyethyl) trimethylene diamine.
[d] Test concluded after 3 months before complete slaking occurred.

While this invention has been described and exemplified in terms of its preferred embodiments, those skilled in the art will appreciate that modifications can be made without departing from the spirit and scope of the invention.

We claim:

1. An improved lime buffing composition containing

as an anti-slaking additive from about 1.5 to about 5.0% by weight of a compound having the formula

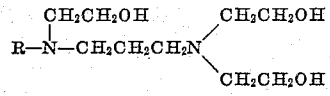


wherein R is an aliphatic hydrocarbon radical having from 8 to 22 carbon atoms.

2. An improved lime buffing composition containing as an anti-slaking additive from about 1.5 to about 5.0 weight percent of N-tallow-N,N',N'-tris(hydroxyethyl)trimethylene diamine.

3. An improved lime buffing composition containing as an anti-slaking additive about 3.0% by weight of N-tallow-N,N',N'-tris(hydroxyethyl)trimethylene diamine.

4. A lime buffing composition consisting of about 65 to 80% by weight of Vienna lime, about 12 to 18% of a saturated fatty acid having a titer of at least 40° C., from 12 to 18% of tallow and 1.5 to about 5.0% by weight of a compound having the formula



wherein R is an aliphatic hydrocarbon radical having from 8 to 22 carbon atoms.

5. A composition according to claim 4 wherein the saturated fatty acid is stearic acid and R is a mixture of aliphatic hydrocarbon radicals as contained in tallow.

6. A lime buffing composition consisting of about 77% by weight of Vienna lime, 14% stearic acid, 6% acidless tallow, and 3% of N-tallow-N,N',N'-tris(hydroxyethyl)-trimethylene diamine.

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