

## UNITED STATES PATENT OFFICE

2,540,376

## BUFFING OR POLISHING COMPOSITION

Theodore F. Onkey, Easton, Conn.

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4 Claims. (Cl. 51—301)

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This invention relates to compositions of matter including an abrasive material, in finely divided form, such as grits of Carborundum, Alundum, corundum, emery, pumice, and the like, carried by a vehicle or binder and employed for buffing or polishing various metals.

In accordance with this invention, I provide a novel buffing and polishing composition of such nature and consistency that it can be applied to the work to be buffed or polished, for instance, silverware, instead of to the revolving buffing or polishing wheel as practiced heretofore, said composition avoiding all the disadvantages previously deemed unavoidable except by applying an abrasive preparation to the wheel in such a manner that none of said preparation was transferred to the work.

The prior art repeatedly stressed the necessity of keeping abrasive preparations on the buffing wheel during the buffing operation so that it would not fall off the wheel and become deposited on the work. Consequently, abrasive compositions heretofore proposed, and those of the kind now in general use, have been made of a consistency ranging from heavily creamy or stiffly viscous or pasty nature, as obtained when using a sodium or potassium soap jelly as the vehicle for a solid abrasive, to a solid of the consistency of cold butter, in order to insure that when the composition is applied to the buffing or polishing wheel, it will be retained thereby and none of the grit, vehicle or binder will be deposited on the work being buffed or polished.

The composition of this invention represents a complete departure from aforesaid prior practice. This invention is based on my discovery that an ideal buffing or polishing operation can be performed when the abrasive composition is compounded so that it can be applied to the work and retained thereon in such a manner as to prevent transference of any substantial part of the composition to the polishing wheel.

An object of this invention is to provide an abrasive composition applicable to the work instead of to the buffing or polishing wheel, said composition yielding a flexible abrasive coating on the metal or other surface to be polished, which adheres tenaciously thereto until brushed off by the polishing wheel.

Another object is to provide an abrasive composition of the aforesaid type, which is low in cost, which will not deteriorate in storage, which will be easy and economical to apply and use, and which will yield a lasting polished surface in use.

A further object is to provide an abrasive com-

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position having the aforesaid advantages, which is of a non-greasy nature, and which will leave the work so clean that subsequent washing and drying operations, heretofore customary in commercial practice, can be dispensed with.

Still another object is to provide an abrasive composition, which will substantially eliminate spoilage and rejection of the metal or other material being polished or finished, by reason of staining or scratching.

My invention provides a novel and valuable abrasive composition, not only adapted for use according to the aforesaid novel technique, but also adapted to attain the objects above set forth, and to have such other advantages as are hereinafter mentioned.

The new composition is a liquid, rather than a paste or solid, but nevertheless has the advantages of a negligibly low rate of evaporation, and substantially constant consistency at varying atmospheric temperatures encountered under conditions of use. Thus, it is relatively resistant to freezing, and can be employed at any of the extreme temperatures encountered in summer or winter without loss of effectiveness.

It is inexpensive, containing relatively few ingredients, which can be easily and cheaply compounded, and contains no starch or similar glutinous and fermentable substances. It is likewise free from waxes, oils and greases; from soaps and soap jells; and from glycerine and other polyhydric alcohols. It requires no formaldehyde or other preservatives.

The composition of my invention comprises a liquid dispersion of a finely divided abrasive, in an aqueous vehicle containing a relatively small amount of glue and of a water-dispersible polyethyleneglycol mono-ester (particularly a diethylene glycol mono-ester) of a higher fatty acid (i. e. a fatty acid occurring as a glyceride in natural fats or oils), the preferred ester being diglycol stearate. The glue and the aforesaid polyethyleneglycol ester are employed in minute amounts, as compared with the water and abrasive, sufficient to maintain the abrasive in stable uniform dispersion, and to form a positioning matrix for the abrasive grits when the composition is applied as a coating to the work to be polished. The composition contains sufficient water, together with the other ingredients, to yield a mixture of highly liquid consistency resembling that of table cream, as ordinarily used in coffee. The composition includes no lubricants, such as grease, oil or wax, nor soaps or soap jells, nor glycerine, nor similar substances.



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The prior art has progressed to the realization that fatty and greasy vehicles or binders for abrasive grits are highly undesirable in that they act as lubricants for the grits, and prevent progressive disintegration of the composition during the buffing or polishing, as required to avoid scratching or cutting of the work. Glycerine and soap jells, which have been proposed as components of a vehicle or binder for the abrasive grits, are themselves lubricative in nature and are subject to the same disadvantages as the fatty or greasy materials. Soap jells heretofore used when employed as the principal constituent of the vehicle or binder for the grit, moreover, have a tendency to dry out rapidly and have insufficient binding effect, so that they cause too rapid a disintegration of the buffing composition. Moreover, when used in sufficiently small amounts to provide a highly liquid composition, as for example, upon dilution of compositions heretofore known with water, they permit the grits to separate out and become segregated in the mixture. The use of the aforesaid polyethyleneglycol mono-fatty acid esters, together with glue, avoids all of these difficulties.

The abrasive composition of this invention differs from the solid compositions, heretofore proposed, including glue as a binder, in that such prior compositions were suitable only for application to buffing or polishing wheels. Moreover, they were unsuitable for use during hot or humid weather in that they stick unevenly to the work and to the hands of the workman, and could only be used with artificial cooling in order to avoid spotting and scratching of the work.

The vehicle for the abrasive compositions of this invention maintains the grits in stable dispersion, has no injurious lubricating effect on the abrasive particles and is completely removed from the work by the buffing wheel so that the work is left in clean polished condition, requiring no subsequent washing or other cleansing prior to further treatment, such as the application of lacquers or the like.

The following example illustrates a preferred composition, in accordance with my invention.

#### Example

Animal glue.....	1/2 lb.
Water.....	5 gals. (42 1/2 lbs.)
Diglycol stearate.....	1 lb.
Carborundum.....	30 lbs.

The glue is soaked for about 24 hrs. in water, at room temperature; the diglycol stearate is added to the water-softened glue, and the mixture is heated to the boiling point, preferably in a steam jacketed vessel. When the resulting solution becomes homogeneous, it is allowed to cool, and the Carborundum grits are added with vigorous agitation or beating.

The composition of the foregoing example, and containing the aforesaid ingredients in the proportions indicated, has given highly satisfactory results, particularly in industrial use, for example, in buffing or polishing silver. Similarly, advantageous results were obtained on other metals or other surfaces.

High quality glue, as for example, Peter Cooper's No. 276 Ground Glue, is preferably employed. Water soluble glutinous gums such as gum arabic can be used in place of animal glue, but are generally more expensive. Hence, animal glue is preferred. Cheaper glues, which contain relatively large amounts of impurities, are not to be recommended, in that the impurities often

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have a tendency to tarnish the work, or to leave spots which must be washed off after the buffing or polishing operation.

Diglycol stearate has been found to be particularly desirable as a dispersing agent in the vehicle. However, it can be replaced by other water-dispersible polyhydric alcohol (particularly polyethylene glycol) mono-esters of higher fatty acids; for example, polyethylene glycol mono-stearate, diglycol laurate, or diglycol oleate, in similar proportions, such materials also yielding non-greasy stable dispersions of the abrasive grits. Certain water-dispersible glycerin mono-esters of higher fatty acids can be used in similar manner, e. g. glyceryl mono-stearate, glyceryl mono-ricinoleate, or glyceryl mono-laurate.

Any suitable abrasive in finely divided form may be substituted for the Carborundum of the above example, Carborundum Grade A. No. 1 being preferably employed for fine polishing work.

The proportions in the foregoing example are susceptible to considerable variation as will be readily understood; I have found the proportions given above satisfactory for obtaining an abrasive preparation for general use on different metals as well as on other materials. Thus, the amount of polyhydric alcohol mono fatty acid ester is preferably from 2 to 3% of the aqueous vehicle, to yield a composition having the desired dispersion stability, liquid consistency and matrix-forming power. The amount of glue employed is preferably not substantially more than sufficient to cause the composition to stick to the work when applied thereto by painting or spraying or by dipping the work into the composition. It is used in somewhat smaller amount than the mono fatty acid ester; e. g. about half the amount of the ester has been found especially suitable. The relatively small proportion of glue employed requires no preservative, such as formaldehyde, to prevent its deterioration.

Thus, the composition of this invention represents a radical departure from previous compositions containing an abrasive with a glue binder. Such compositions were of the pasty type for application to the wheel, instead of to the work, and were intended to overcome the disadvantages of compositions containing greasy binders. In general, however, the glue binders thus employed permit undesirable waste of the abrasive material applied to the wheel, in that portions thereof are thrown off on the wheel and withdrawn by the blowers before the work to be buffed is brought in contact with the wheel. The unevenly deposited abrasive remaining on the wheel fails to provide a uniform abrasive action on the work to be polished, and yields an uneven finish. Moreover, in warm weather, the glue binders, containing the usual preservatives, render such compositions practically useless in that they stick to the hands of the workmen and form a smeary, rather than a clean finished surface, thus defeating the object for which they are intended. Workers with such materials are generally required to wear gloves, which must be changed frequently, at considerable expense.

The preparation provided by this invention is liquid, but nevertheless maintains the abrasive grits in uniform stable dispersion at various temperatures prevailing during application of the composition to the work. The compositions require no preservative, such as formaldehyde, and contains no glycerine or similar material.

The cost of my abrasive composition is much less than any of the compositions on the market



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known to me, and in use; it provides much greater economy and convenience than is possible with previously known materials.

In sharp contradistinction to previous practice for buffing or polishing, the composition of this invention is applied to the work, and not to the friction or polishing wheel, for example, by painting or spraying the work with the composition, or by dipping the work into the liquid. The consistency of the preparation is such that a uniform coating is produced over the surface to be buffed or polished.

By varying the liquidity, as by adding water, the thickness of the coating can be controlled to insure that all of the binder, vehicle and abrasive is removed in the particular buffing or polishing operation to be carried out, leaving the surface with any desired finish, such as a dull luster, or a high polish, but in any case clean and requiring no further treatment.

Practically none of the binder or other vehicle components is transferred to the buffing wheel so as to accumulate thereon, and therefore, does not interfere with the uniform polishing action on the surface to be polished, as in the case of compositions of the prior art, which render uniform finishing of the work extremely difficult if not impossible.

Moreover, when the abrasive composition is applied to the work, instead of to the wheel, waste of the composition is practically eliminated. No more than sufficient buffing composition is applied to the work than is required, so that the material fails to accumulate on the wheel. Thus, the waste of abrasive, resulting in prior practice from the fact that the abrasive is drawn off by the blowers before the work contacts the wheel, is avoided, as well as the non-uniform polishing effect resulting when the abrasive composition is thrown off the wheel and withdrawn in a non-uniform manner.

The vehicle employed in the compositions of this invention, forms a positioning matrix for the grits when the composition is applied as a coating to the work and disappears as the polishing proceeds. The buffing wheel remains clean and dry and the full polishing power of the composition is applied evenly over the entire coated portion of the work. The resulting polished or buffed surface is clean and dry, and can be easily lacquered, or subjected to any other operation without preliminary washing or cleansing.

Variations and modifications can be made in the example without departing from the scope

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thereof, and it will be understood that the invention includes all modifications within the scope of the appended claims.

I claim:

1. A liquid abrasive composition for metal adapted to be applied to a metal surface consisting of a dispersion of abrasive grits in water containing two to three percent of a water-dispersible higher fatty acid mono-ester of an alcohol selected from the group consisting of the dihydric and trihydric alcohols, and glue amounting to about half the quantity of said higher fatty acid mono-ester.

2. A liquid abrasive composition for metal adapted to be applied to a metal surface to be removed therefrom by buffing means without substantial transference to the buffing means consisting of abrasive grits uniformly dispersed in an aqueous vehicle containing diglycol stearate as a suspending agent, a quantity of glue in an amount from about 0.5% to 1.5% of the weight of the water, and a sufficient amount of water to yield a highly liquid dispersion.

3. A liquid abrasive composition for metal adapted to be applied to a metal surface consisting of abrasive grits and a dispersing vehicle for said grits containing by weight, 80 parts water, 1 part glue, and 2 parts diglycol stearate.

4. A liquid abrasive composition for metal adapted to be applied to a metal surface consisting of 60 parts by weight of abrasive grits in a dispersing vehicle, said vehicle containing, by weight, 80 parts water, 1 part glue and 2 parts of diglycol stearate.

THEODORE F. ONKEY.

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The following references are of record in the file of this patent:

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Number	Name	Date
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"Chemicals by Glyco," Glycol Products Co., Inc., 26 Court Street, Brooklyn, New York, 1944, page 116; page 31.

"The Chemical Formulary," by H. Bennett, vol. IV, pages 403, 412 and 413.

**Certificate of Correction**

Patent No. 2,540,376

February 6, 1951

**THEODORE F. ONKEY**

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 6, line 47, list of references cited, after "Aug. 24, 1943" insert the following:

***FOREIGN PATENTS***

<i>Number</i>	<i>Country</i>	<i>Date</i>
198807	Great Britain -----	June 14, 1923

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of May, A. D. 1951.

[SEAL]

**THOMAS F. MURPHY,**  
*Assistant Commissioner of Patents.*