UNITED STATES PATENT OFFICE.

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BASE FOR METAL-CUTTING COMPOUNDS AND PROCESS OF PREPARING THE SAME.

1,367,428. Specification of Letters Patent. Patented Feb. 1, 1921.

No Drawing. Application filed March 25, 1919. Serial No. 284,980.

To all whom it may concern:

Be it known that I, GEORGE W. PRESSELL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented Improved Bases for Metal-Cutting Compounds and Processes of Preparing the Same, of which the following is a specification.

My invention relates to the class of oleaginous products known as "cutting oils", or "cutting oil compounds", such as are employed to cool metal while it is being cut by a suitable tool, and also cool the curled chip which rubs against the cutting tool. A continuous stream of cutting oil or cutting oil compound is directed against the tool and the work, and the heat conducting properties of the oil or oleaginous compound conduce to a clean cut and lengthen the life of the cutting tool.

The purpose of my invention is two-fold; one object being to supply a greatly improved product of the type referred to, and a further object being to supply such product in an improved form, which will have many advantages over the form in which cutting oils and similar materials are at the present time offered to the trade, and which will have the additional advantages of being comparatively cheap for the use for which it is produced, and of being ready for use when delivered, or for admixture with water or a mineral oil, or other suitable diluent.

A further and important object of my invention is to provide a product that is stable under all conditions, and in carrying out my invention I provide a combination of ingredients producing a body that is stable in the concentrated form as well as in the diluted condition ready for use, which dilution has resulted from an admixture of a relatively large proportion of a mineral oil or other suitable diluent. This condition of stability is a highly important matter in products of this character, since it insures a much greater opportunity for successful use in the performance of the function for which the product is intended.

In the use of my improved product, the base is soluble in the proper oil or oleaginous material which serves as a diluent; the mixture being effected without heat, and being thoroughly homogeneous. This mixture is stable; it does not separate upon standing nor in use; it is not affected by atmospheric changes, and it cannot be separated by centrifugal action.

I have found that it is in many ways advantageous if a product for the purposes described is furnished to the trade or consumer in the form of a concentrated base, which when mixed in proper proportions with a mineral oil, or what is commonly called a hydro-carbon oil, of comparative fluidity, such for example as one of that group of oils commonly called paraffin oils; or that group of mineral oils known as distillated, and generally described by the trade names of "neutral oils"; "filtered neutral oils"; "red neutral oils"; "300 miners burning oil"; "150 headlight or kerosene oils"; "125 burning oil or kerosene"; and allied products, will give the finished working product.

The preferred process by which I form my improved product, which I term a "refrigerant base", is as follows:—

The ingredients, which may comprise wool fat or distilled wool grease, sulfur, lard oil and paraffin oil are mixed together, and the whole brought to a temperature of approximately 350° Fahr., at which temperature the sulfur will be completely dissolved, and combined with the other constituents.

In some cases I have found it advantageous to first thoroughly dissolve the sulfur in the wool fat or distilled wool grease, by bringing the wool fat or distilled wool grease slowly to a temperature of 350° Fahr. and slowly adding the sulfur during the process of heating. When this mixture of wool fat or distilled wool grease and sulfur has reached the stated temperature and the sulfur is thoroughly dissolved, the lard oil and paraffin oils, which have been heated in a separate receptacle to 300° Fahr., are added to the wool fat or distilled wool grease and sulfur mixture; the mass being agitated during the mixing process. The mixture is then allowed to cool, after which it may be perfumed in any suitable manner, a small quantity of a suitable antiseptic added, and it is then ready for the market as a "refrigerant base".

As a preferred formula, I may give the following:—

Wool fat or distilled wool grease, approximately	30%
Sulfur, approximately	13%
Lard oil, approximately	26%
Paraffin oil, 28° Baumé	30%

This base, added to mineral oils such as above referred to in the proportions of from 25 to 100 pounds of "refrigerant base" to a barrel of mineral oil, will be found to give excellent results, the "refrigerant base" adding greatly to the heat absorbing qualities of the oils or oleaginous material employed. The mixture of "refrigerant base" and mineral oil may be used in its normal form, or in the form of an emulsion with alkali water as desired.

When the "refrigerant base" is added to paraffin or other oils, the application of heat is unnecessary since, owing to the syrupy consistency of the "refrigerant base," its peculiar make-up, the methods used in its manufacture for incorporating the component parts, and to the relative proportions of the materials used, the "refrigerant base" dissolves thoroughly without heat and with but very little agitation, and possesses the same homogeneity and stability in the diluted condition as it did in the concentrated form.

The advantages of a "refrigerant base" such as I have described will be apparent. An amount of base necessary for making up a large quantity of cutting oil or cutting oil compound will have comparatively small bulk, insuring ease of handling and storing, and a great decrease in the freightage expenses. As explained, the solvent for the "refrigerant base" can be a mineral, neutral or burning oil, and these products can be picked up economically in territories adjacent to refineries at which they are produced, and by mixing the "refrigerant base" with the solvent picked up at these various points, a large saving is effected in cost of transportation and investment on goods while in transit and in carrying a stock to protect against delay in shipments from a distance.

The use of this base means a material saving in the overall expenses, and there is the additional advantage that the cutting oil or cutting oil compound may be mixed to any desired density to increase production or insure a longer life of tools, to meet the requirements of the particular work involved, by merely changing the proportions of the base and the mineral or other oils with which it may be diluted.

By the employment of the base described, I have secured an increase in efficiency of the product, as compared with cutting oils or cutting oil compounds in common use; discoloration of the metal is eliminated; the product can be readily made antiseptic; avoiding all danger of infection in handling, and in use the cutting fluid shows but little, if any, change in temperature and there is no smoking such as commonly occurs with ordinary cutting oils or cutting oil compounds.

It will be understood that in the broader aspect of my invention, I do not wish to be limited to the specific ingredients named in the formula, as other animal, vegetable and mineral products can be substituted and good results obtained. Nor do I wish to be confined to the particular proportions of ingredients mentioned as the percentages may be varied within wide limits.

I claim:

1. A cooling composition for use on metal cutting tools, comprising a stabilized base of animal fat, sulfur and paraffin oil, capable of forming a permanent dilute solution with hydrocarbon mineral oil.

2. A cooling composition for use on metal cutting tools comprising a stabilized base of wool, fat, sulfur, lard oil and paraffin oil, capable of forming a permanent dilute solution with hydrocarbon mineral oil.

3. A stabilized base for a cooling composition for use on metal cutting tools comprising 30 parts of wool fat, 13 parts of sulfur, 26 parts of lard oil and 31 parts of paraffin oil 28° Baumé.

4. The process of preparing a metal cutting oil compound, which consists in dissolving sulfur in a hot mixture of animal fats and paraffin oil, allowing the mass to cool and thereafter forming a dilute solution of the same in a mineral hydrocarbon oil.

5. The process of preparing a base for a cutting oil compound, which consists in bringing animal fat to a temperature of about 350° F., slowly adding sulfur thereto during the heating process, and then adding mineral oil and other animal fat heated to a temperature of about 300° F.

GEORGE W. PRESSELL.