United States Patent Office 3,351,444 Patented Nov. 7, 1967

3,351,444

GRANULAR FIRE STARTING MATERIAL

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No Drawing. Filed Mar. 28, 1966, Ser. No. 537,701
4 Claims. (Cl. 44—41)

This invention relates to a granular fire starting material and more particularly to such a material suitable for starting fires in charcoal grills, fireplaces, camp fires, and the like.

The use of outdoor grills, camp fires, and fireplaces have become increasingly popular along with the corresponding popularity of other leisure time activities. The conventional technique of kindling such fires is by using a liquid starter which most often is a petroleum fraction having a relatively high volatility and a relatively low flash point so that it may be ignited easily. While these materials are easily ignited they are very hazardous in shipping, storage and use. With many of these materials, a sudden flash occurs when they are ignited. The user is often burned in lighting these materials. Another type of accident which is prevalent with the volatile liquid fire starting materials occurs when an insufficient amount was used before it is ignited and the user attempts to add more by pouring it on the existing fire. The existing flame or hot coals then ignites or explodes the entire contents of the can thereby injuring the user.

In addition to the liquid types of starting materials, certain briquetted igniting materials are also known in the prior art. A typical example is disclosed in U.S. Patent No. 3,089,760. The product disclosed in this patent as well as the other solid types of prior art igniting materials requires that they be briquetted in order to produce a granule which is suitable. This processing requirement clearly adds to the cost of the material.

In view of the foregoing, it is an object of this invention to provide a granular fire starting material which is safe to use, ship and store.

A further object of this invention is to provide a granular fire starting material which may be easily ignited without danger to the user.

A still further object of this invention is to provide a granular fire starting material which is easily ignited and will last for an extended period of time.

A further object of this invention is to provide a granular fire starting material which will not leave any residues which are objectionable in odor or taste.

A further object of this invention is to provide a granular fire starting material which is inexpensive.

A further object of this invention is to provide a granular fire starting material which has an acceptable granule size without the necessity of briquetting.

It was discovered quite unexpectedly, that by combining diatomaceous earth, or equivalent materials, with an organic solvent having a flash point ranging from 120° F. to 150° F., and a small amount of a fibrous material, such as lint, a granular fire starting material was obtained which was easily ignited, persisted for an extended period of time, and did not leave any objectionable odors or residues. This material did not flash upon ignition.

An excellent example of a material falling within the scope of this invention is as follows:

	Percent
Diatomaceous earth	80
Soap	1
Activated carbon	1
Sweetening agent	½
Solvent having a flash point of 140° F	10
Lint	Balance

In addition to diatomaceous earth, other suitable bases have been found to include fullers earth, bauxites, vermiculites, perlites, expanded slag aggregates, gypsum, dolomite, clay, bentonites, and asbestos. It is preferred to use the Hy-Flo type of these materials. A particularly suitable base is Hy-Flo Super Cel sold by Johns Manville.

In addition to lint other suitable fibrous burnable materials have been found to include any burnable or combustible fibrous materials of plant origin. While glass fibers might appear to serve the same purpose as the plant fibers, their use is not contemplated by this invention because they are not combustible. However, any fibrous material which is burnable is suitable for the material of this invention.

The particular inflammable liquid used is not critical so long as it has a flash point between 120° F. and 150° F. Solvents having a flash point lower than 120° F. are not particularly suitable for this invention because they are too easily ignited and therefore dangerous. However, petroleum fractions having a flash point in excess of 160° F. burn too slowly and are therefore not suitable for this invention. A particularly suitable inflammable liquid has been found to be a product sold by Gulf under the trade name Stoddard 140. This material has a flash point of 140° F.

Other specific suitable inflammable liquids have been found to be amyl alcohol, bromobenzene, n-butyl alcohol, butyl acetate, n-butyl acrylate, butylbenzene, Cellosolve solvent and Cellosolve acetate, dibutylamine and di-n-butylamine, diethylbenzene, diethyl-ethanolamine, diisobutyl ketone, ethylbutanol, ethyl chloroacetate, n-ethyl ethanolamine, 2-ethylhexaldehyde, 2-ethylhexyl amine, 2-ethylhexyl chloride, ethyl lactate, ethyl phenyl ether, 2-ethyl-3-propylacrolein, ethylene carbonate chlorhydrin, furfural, fusel oil, heptanol-3, methyl amyl alcohol, methyl Cellosolve, 2-methyl-5-ethyl pyridine, methyl isobutyl carbinol, methyl lactate, 2-methyl pentanol-1, 1-methyl-1-phenylethylene, monoisopropanolamine, 2,6-dimethylheptyl 4-acetate, 2,6-dimethylheptyl 4-phenol, propylene chlorhydrin, propylene diamine, tetraethyl o-silicate, vinyl 2-ethylhexyl ether.

While the specific amounts of the various materials present is not critical it is preferred that such materials be present within the following range:

	Percent
Particulate base	60–80
Inflammable liquid	5–20
Lint	3–15
Liquid soap	1–10
Sweetener	1–10
Activated charcoal	1–10

The essential ingredients are the particulate base, the solvent having a flash point falling within the noted range, and the lint to serve as a binder for the particulate base material. The activated charcoal is used primarily to impart a uniform gray or black color to the material. It should be apparent, however, that the activated charcoal itself serves to absorb and adsorb a certain amount of the inflammable liquid and is itself combustible. The sweetening agent is added merely to impart a pleasant odor to the material while it is burning. It has been found, however, that an excessive amount of the fibrous material, such as lint, gives a product which smolders and therefore should be avoided. The maximum lint should not exceed about 12%.

The granular material is prepared by mixing the particulate base with the solvent using an excess amount of the solvent. The fibrous material is then added and thoroughly mixed with the other ingredients. The soap, as well as the activated charcoal and the sweetening agent if the latter are to be used, are added and thoroughly mixed with

the other constituents. The solvent is then extracted by any suitable means, such as a filter press, to reduce the concentration to from 5–20% by weight. The resulting material is a soft texture having a particle size ranging from about 4–300 mesh. It is apparent that the fibrous material assists in agglomerating the particulate base upon which the inflammable liquid has been adsorbed. This material is then placed in a grill for example, under the charcoal which is to be used. When flame is applied the starting material is instantly ignited and, without a flash, continues for a 4 or 5 minute period which is sufficient to ignite the charcoal. It is thought that the carbon and the fibrous materials, being slower burning than the inflammable liquid, account in part for the extended period of flame. Additionally, it is thought that the particle size, and particularly, the presence of certain granules as large as ¼ to ⅓ of an inch in mean diameter, enhance this result because the inflammable liquid is not immediately exposed to the flame but is retained within the interstices of the granule for a period of time.

The fire starting material was prepared in the manner mentioned from the following constituents and was observed to give excellent results in starting both charcoal and wood.

	Percent By Weight		
Example	A	B	C
Particulate base:			
Diatomaceous earth	60		
Fullers' earth		80	
Dolomite			70
Inflammable liquid:			
Cellosolve solvent	20		
Butylbenzene		10	
Propylene diamine			18
Cotton lint	15		
Wool lint		10	
Linen lint			7
Activated charcoal	5		2
Soap			2
Sweetener			1

Conceivably, other ingredients could be added to modify the product in numerous respects but the invention contemplates the presence of the particulate base, the inflammable liquid having a flash point between 120° F. and 150° F. along with a sufficient amount of a fibrous combustible material, such as lint, to bind together the particles of base so that when the filter cake is broken up, granules of the product results directly without the necessity of further processing and a small amount of a solvent soluble surface active agent, such as mahogany soap.

It is also necessary to use soap to alleviate premature evaporation of the solvent during shipping, storage, etc. The particular type of soap is not important as long as

it is soluble in the solvent. The petroleum sulfonates, or mahogany soaps, which are anionic surface active agents, are particularly suitable. The petroleum sulfonates are prepared by acid refining of lubricating oils and white oils and comprise essentially sodium salts of naphthalene sulfonic acid. Also suitable are alkyl aryl sulfonates and some of the sulfated and sulfonated amide and ester types of detergents. The nonionic synthetic detergents, such as the alkyl aryl polyglycol ethers and alkylol amides are also suitable.

For purposes of description certain specific examples have been employed but these are meant to be illustrative only. Numerous variations may be made with respect to the particular materials employed, the amounts utilized, etc., without departing from the spirit of the invention. It is desired, therefore, to be limited only by the scope of the appended claims.

The invention claimed is:

1. A granular fire starting material comprising from 50 to 90% of a non-combustible particulate absorbent mineral, from 5 to 20% of an organic solvent having a flash point from 120° to 150° F., from 1 to 10% of a solvent soluble surface active agent and the remainder a fibrous textile material, said fibrous material serving as a binding agent for the particulate absorbent material to provide granules ranging in size from 4 to 300 mesh.

2. The material of claim 1 further characterized in that the fibrous textile material is lint.

3. The composition of claim 1 further characterized in that it also includes from 0.5 to 5% activated charcoal.

4. The material of claim 1 further characterized in that the particulate mineral material is selected from the group consisting of fullers' earth, bauxite, vermiculite, perlite, expanded slag aggregates, diatomaceous earth, gypsum, dolomite, talc, bentonite, clay and asbestos.

References Cited

UNITED STATES PATENTS

246,614	9/1881	Jones	44—6
342,814	6/1886	Stewart	44—41
1,599,948	9/1926	Blacklock	44—7
2,885,360	5/1959	Haden et al.	44—7
3,089,760	5/1963	Jaffe	44—41
3,226,208	12/1965	Mueller et al.	44—41
3,260,581	7/1966	Martin	44—41

FOREIGN PATENTS

121,431	12/1918	Great Britain.

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