United States Patent [19]

Adell

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[54] **INVERT EMULSION FIRE EXTINGUISHING COMPOSITION AND METHOD**

[76] Inventor: **Franklin Z. Adell,** 1429 Ardmoor, Birmingham, Mich. 48010

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[52] **U.S. Cl.** **252/8.05;** 169/43; 169/44; 169/45; 169/46; 169/47; 252/2; 252/309

[51] **Int. Cl.**[2] **A62C 1/06**

[58] **Field of Search** 252/8.05, 2, 309; 169/43–47

[56] **References Cited**

UNITED STATES PATENTS

3,637,022 1/1972 Kelly et al. ..... 252/8.05 X

FOREIGN PATENTS OR APPLICATIONS

726,670 1/1966 Canada 252/2

Primary Examiner—Benjamin R. Padgett
Assistant Examiner—E. Suzanne Parr
Attorney, Agent, or Firm—Harness, Dickey & Pierce

[57] **ABSTRACT**

A new fire extinguishing composition in the form of a high aqueous content thick viscous material which forms an effective water blanket when applied or sprayed on horizontal or vertical surfaces and the like.

6 Claims, No Drawings

INVERT EMULSION FIRE EXTINGUISHING COMPOSITION AND METHOD

BACKGROUND OF THE INVENTION

This invention broadly relates to a new fire extinguishing composition and method of preparing and applying same.

The state of the art is indicated by the following references: U.S. Pat. Nos. 2,182,440; 2,356,205; 3,254,714; 3,297,084; 3,330,343; 3,356,610; 3,425,939; 3,432,454.

The main object of this invention is to provide a new and improved fire extinguishing composition.

Another object of the invention is to provide a new method of formulating a fire extinguishing composition.

Still another object of the present invention is to provide a new method of fire extinguishing.

Other objects, features and advantages of the present invention will become apparent from the subsequent description and the appended claims.

SUMMARY OF THE INVENTION

While it is not fully understood why the invention works in such a highly satisfactory manner and while it is still being attempted to ascertain the underlying reasons which bring about the excellent workability of the invention, the following points are considered to be of significant importance. When the composition of this invention is applied to a fire, it effectively appears that a water blanket is formed from the composition. The composition itself is in the form of a thick viscous substance or invert emulsion which causes the encapsulation of numerous small drops of water within the composition which when applied forms a protective coating over a surface to thereby extinguish or prevent fire.

The viscosity of the composition generally is unusually thick and viscous and has a consistency similar to that of mayonnaise and the viscous composition has a gel like structure. The composition has the ability to adhere to vertical surfaces as well as horizontal surfaces wherein the surfaces are of materials such as steel, wood, brick, cement, glass, tarred surfaces, etc. When the composition is sprayed on a burning surface, it has the ability to build up a layer or coating that extinguishes or assists in preventing fire. When the composition or emulsion of this invention is heated above the boiling point, it has been discovered that vaporization occurs leaving an oily like residue. Subsequently or eventually the oily like residue evaporates when exposed to air in most instances. Also in accordance with the invention, the fires may be controlled from spreading by spraying the emulsion or composition of this invention on areas not yet reached by the fire and the composition then prevents the fire from spreading to such areas. In accordance with the inventive discovery herein, it also appears that when a fire or a flame is applied to the emulsion or composition the gel like structure strongly resists break down.

Briefly stated the present invention concerns a fire extinguishing composition, in the form of an invert emulsion and being of relatively thick viscosity, comprising, (a) at least one non-ionic surfactant means selected from the group consisting of alkylphenoxy poly(oxyethylene)ethanols, and (b) water, wherein the ratio of (b) to (a) is between about 5:1 and 35:1.

In another aspect the present invention involves a method of fire fighting comprising applying to the fire a composition comprised of (a) at least one non-ionic surfactant means selected from the group consisting of alkylphenoxy poly(oxyethylene)ethanols, and (b) water, wherein the ratio of (b) to (a) is between about 5:1 and 35:1.

From still another aspect the present invention comprises a method of fire fighting comprising, (a) adding water to a concentrated surfactant means with generally concurrent application of sufficient controlled mixing energy to achieve an inverted emulsion type composition in a gel like structure wherein said surfactant means generally encapsulates the water in small droplets to form the emulsion which is thick and viscous, and (b) applying said emulsion to a desired surface for fire fighting.

DESCRIPTION OF PREFERRED EMBODIMENTS

In accordance with the inventive discovery herein, one particularly suitable fire fighting composition is made from a concentrate formulation comprised of a non-ionic surfactant material such as an alkylphenoxy poly(oxyethylene)ethanol type surfactant or surfactant mixture which is combined with a suitable solvent for the concentrate such as petroleum naptha or the like. The concentrate formulation or surfactant means is mixed with water and it has been discovered that it is critically important to the invention herein that the water be added to the concentrate formulation slowly or the water should be added to the concentrate with concurrent application of sufficient controlled mixing energy to achieve the unique inverted emulsion in the form of a gel like structure having a mayonnaise like consistency and viscosity.

The fire fighting composition discovered and disclosed herein may be applied to desired surfaces in a number of different manners. For example, it may be applied by pouring, pumping, spraying, etc. The important point is that the composition herein, once applied, is highly effective in extinguishing or preventing fires. When applied by spraying or through a nozzle, it has been discovered that the composition herein must be applied through a nozzle opening which does not restrict or break down the gel like structure such that the composition would be changed back to a form wherein the water is non encapsulated.

The ratio of water to the concentrate or surfactant means herein should broadly be within the range of about 5:1 and 35:1, and preferably this ratio should be maintained within the range of about 20:1 and 30:1. The viscosity or consistency of the composition herein is like mayonnaise in appearance.

In order to further illustrate the invention, the following examples are provided. It is to be understood, however, that the examples are included for illustrative purposes and are not intended to be limiting of the scope of the invention as set forth in the subjoined claims.

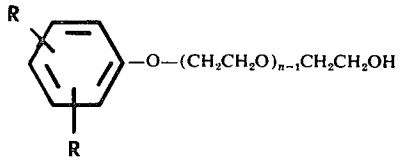
EXAMPLES

No.		1	2	3	4	5	6	7	8
(a)	Concentrate-Surfactant Formulation Igepal DM-430	16	10	13	12	20	30	—	—

EXAMPLES – Continued

No.		1	2	3	4	5	6	7	8
	Igepal CO-310	9	5	7	6	12	—	25	—
	Igepal CO-530	4	3	4	3	8	—	—	35
	Petroleum Naptha SC-205	71	82	76	79	60	70	75	65
	Total parts by weight	100	100	100	100	100	100	100	100
(b)	Water-balance of composition at volume ratio of (water/concentrate)	7/1	20/1	25/1	30/1	35/1	25/1	30/1	28/1

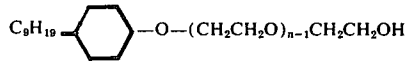
IGEPAL is a TRADEMARK of the GAF Corporation. The IGEPAL DM surfactant has a chemical structure of a polyoxyethylated dialkylphenol, illustrated by the following formula:



hydrophobic hydrophilic
dialkylphenoxypoly(ethyleneoxy)ethanol

(*n* denotes the number of moles ethylene oxide per mole of dialkylphenol).

The IGEPAL CO surfactants have a chemical structure of a polyoxyethylated nonylphenol, illustrated by the following formula:



hydrophobic hydrophilic
nonylphenoxypoly(ethyleneoxy)ethanol

(*n* denotes the number of moles ethylene oxide per mole of nonylphenol).

Example Formulating Procedure: add water into concentrate portion (a) at 1 to 1 ratio and mix, then add 2 added volume parts water and mix, then slowly add additional water with simultaneous high agitation of the mixture until ratio indicated is achieved.

While it will be apparent that the preferred embodiments of the invention disclosed are well calculated to fulfill the objects above stated, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope or fair meaning of the sub-joined claims.

What is claimed is:

1. A fire extinguishing composition, in the form of an invert emulsion and being of relatively thick viscosity, consisting essentially of,

a. at least one non-ionic surfactant means selected from the group consisting of alkylphenoxy poly(oxyethylene) ethanols, and

b. water,

wherein the ratio of (b) to (a) is between about 5:1 and 35:1.

2. The invention of claim **1** wherein,

said ratio is between about 20:1 and 30:1.

3. A method of fire fighting comprising applying to the fire a composition consisting essentially of

a. at least one non-ionic surfactant means selected from the group consisting of alkylphenoxy poly(oxyethylene) ethanols, and

b. water,

wherein the ratio of (b) to (a) is between about 5:1 to 35:1.

4. A method of fire fighting consisting essentially of,

a. adding water to a concentrated non-ionic surfactant with generally concurrent application of sufficient controlled mixing energy to achieve an inverted emulsion type composition in a gel like structure wherein said surfactant generally encapsulates the water in small droplets to form the emulsion which is thick and viscous,

b. applying said emulsion to a desired surface for fire fighting.

5. The invention of claim **4** wherein,

said emulsion is applied through a nozzle opening means operative for maintaining the gel like structure and preventing de-encapsulating of the water.

6. The invention of claim **4** wherein,

the water and surfactant are present respectively at a ratio between about 20:1 and 35:1.

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