

[54] **PRILLED AMMONIUM NITRATE  
COMPOSITION OF IMPROVED  
ANTI-SCATTERING PROPERTIES**

[75] Inventors: **Konoshuke Fujiki**, Tokyo; **Katsuaki Inafuku**, Kitakyushu; **Hiroshi Shimizu**, Kitakyushu; **Toshiharu Shigematsu**, Kitakyushu; **Kazumi Kumura**, Kitakyushu, all of Japan

[73] Assignee: **Mitsubishi Chemical Industries Limited**, Tokyo, Japan

[22] Filed: **Sept. 15, 1972**

[21] Appl. No.: **289,729**

[30] **Foreign Application Priority Data**

Sept. 27, 1971 Japan..... 46/75330

[52] U.S. Cl..... **149/7, 149/5, 149/46**

[51] Int. Cl..... **C06b 1/04**

[58] Field of Search..... **149/7, 46, 5**

[56] **References Cited**

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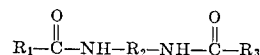
*Primary Examiner*—Stephen J. Lechert, Jr.

*Attorney*—Norman F. Oblon et al.

[57]

**ABSTRACT**

A prilled ammonium nitrate composition having blended with (1) a petroleum hydrocarbon having a boiling point of more than 150°C. and a melting point of less than 20°C. and (2) at least one anti-coagulant selected from (a) magnesium, barium, lead, calcium, zinc, copper, aluminum and cadmium salts of fatty acid of seven to 22 carbon atoms and a melting point of more than 40°C., (b) magnesium aluminate silicate and (c) a compound of the formula:



, and wherein R<sub>1</sub> and R<sub>3</sub> each represent alkyl groups having 10 to 20 carbon atoms and R<sub>2</sub> is an alkylene group having one to two carbon atoms, which composition is characterized by improved anti-caking and anti-scattering properties.

**5 Claims, No Drawings**

# PRILLED AMMONIUM NITRATE COMPOSITION OF IMPROVED ANTI-SCATTERING PROPERTIES

## BACKGROUND OF THE INVENTION

### 1. Field Of The Invention

The present invention relates to a prilled ammonium nitrate composition having improved anti-caking and anti-scattering properties and to a method of making the same.

### 2. Description Of The Prior Art

Ammonium nitrate is known to exist in several different crystalline structures, depending upon temperature. Each of these structures are characterized by a different water solubility, specific volume and degree of hygroscopicity. As the ammonium nitrate is subjected to cycling across the crystal structure transition temperature, therefore, it experiences variations in solubilities, specific volume and hygroscopicity. If the ammonium nitrate is in the form of "prills" or small, spherical, usually hollow, particles, as are commonly used for various commercial and agricultural purposes, the prills tend to absorb increasing amounts of moisture from the air, and tend to cake into a non-flowable mass. In the past, it has been attempted to reduce this caking tendency by coating the prills with anti-caking agents, such as powdered talc, diatomaceous earth, talc or the like. The difficulty with the use of such conventional anti-caking agents, is that they cannot be completely and uniformly coated onto the prills. A portion of the powdered anti-caking agent will invariably remain unadhered to the prills. The presence of this powder results in reductions in operation efficiency and often creates sanitation difficulties.

It has been suggested to reduce the quantity of anti-caking agent used so that it is entirely adhered to the prills. However, it has been found that such reductions will adversely reduce the effects of the agent in preventing caking.

A need continues to exist, therefore, for a prilled ammonium nitrate composition which is characterized by improved anti-caking properties and improved anti-scattering properties.

## SUMMARY OF THE INVENTION

Accordingly, it is one object of the present invention to provide a prilled ammonium nitrate composition characterized by improved anti-caking and anti-scattering properties.

Another object of the present invention is to provide a method of making the prilled ammonium nitrate composition having such improved anti-caking and anti-scattering properties.

These and other objects of this invention, as will hereinafter become more readily understood, have been attained by blending prilled ammonium nitrate with:

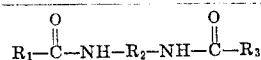
1. a petroleum hydrocarbon having a boiling point of more than 150°C. and a melting point of less than 20°C. and

2. at least one anti-caking agent selected from the group consisting of:

a. magnesium, barium, lead, calcium, zinc, copper, aluminum, and cadmium salts of fatty acid having seven to 22 carbon atoms and a melting point of greater than 40°C.;

b. magnesium aluminate silicate; and

c. a compound represented by the formula:



wherein R<sub>1</sub> and R<sub>3</sub> each represent alkyl groups having 10 to 20 carbon atoms and R<sub>2</sub> represents an alkylene group having one to two carbon atoms.

Another object of this invention is accomplished by aerating prilled nitrate containing 2 to 10 percent by weight of water, at a temperature of 40° to 90°C., adding a drying aid, drying at a temperature higher than said aerating temperature and blending the obtained granular ammonium nitrate with:

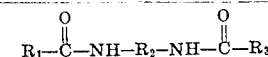
1. a petroleum hydrocarbon having a boiling point of more than 150°C. and a melting point of less than 20°C. and

2. at least one anti-caking agent selected from the group consisting of:

a. magnesium, barium, lead, calcium, zinc, copper, aluminum, and cadmium salts of fatty acid having seven to 22 carbon atoms and a melting point of more than 40°C.;

b. magnesium aluminate silicate; and

c. a compound represented by the formula:



, wherein R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are as defined above.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

According to the present invention, a particular petroleum hydrocarbon and anti-caking agent are blended with prilled ammonium nitrate.

The petroleum hydrocarbon used herein should have a boiling point of greater than 150°C. and a melting point of less than 20°C., preferably less than 0°C. Suitable hydrocarbons include the distillates having average boiling points of 200° to 300°C. obtained by atmospheric distillation of crude oil; the liquid paraffins prepared by dewaxing a wax containing fraction obtained by vacuum distillation of paraffinic crude oil; the processing oils, such as cutting oil, quenching oil, etc.; the light lube oils, such as spindle oil, refrigerating oil, turbine oil, etc., and mixtures thereof. Petroleum hydrocarbons having melting points of more than 20°C. are not desirable, since their anti-scattering effects are low. It is believed that the poor results obtained with such hydrocarbons is a result of the fact that they are easily solidified after being added to the prilled ammonium nitrate. Petroleum hydrocarbons having boiling points of below 150°C. are not desirable in practical situations because they are largely lost when the treated prills are dried.

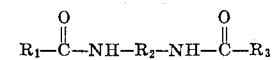
If the quantity of the petroleum hydrocarbon used is too small, the quantity of anti-caking agent adhering to the prilled ammonium nitrate will be too low and the anti-scattering effect of the agent will be too small. On the other hand, if the quantity of additive is too large, the prilled ammonium nitrate admixed with the additive will be so wet that handling can become difficult. Therefore, it is desirable to use the petroleum hydrocarbon in amounts of from 0.05 to 1.0 percent based on the weight of the prilled ammonium nitrate.

The anti-caking agent used in the present invention may be selected from at least one of:

a. magnesium, barium, lead, calcium, zinc, copper, aluminum, cadmium salt of fatty acid having a carbon atom content of seven to 22, and a melting point of greater than 40°C.;

b. magnesium aluminate silicate; and

c. a compound represented by the formula:



, wherein  $R_1$ ,  $R_2$  and  $R_3$  are as defined above. The salts of group (a) are most preferred.

Suitable salts of group (a) include magnesium stearate, barium stearate, zinc oleate, copper palmitate, aluminum stearate, cadmium oleate, calcium stearate, magnesium oleate, etc. Magnesium stearate is most preferred. The metallic salts of fatty acids having carbon contents of less than six carbon atoms, or melting points of below 40°C., are not desired since their anti-caking effects are low and/or they tend to melt due to the rising of temperature during storage so that caking of the prilled ammonium nitrate can occur.

Suitable compounds of group (c) include, for example, methylene bispalmitylamide, methylene bis-stearoamide, ethylene bis-stearoamide, a formaldehyde condensate of palmitic acid amide and stearic acid amide, etc. or mixtures thereof.

When the quantity of anti-caking agent blended therewith is too small, sufficient anti-caking effects cannot be obtained. If excess amounts are used, no significant improvements in anti-caking effects and anti-scattering effects can be expected. When using prilled ammonium nitrate as a raw material for producing such explosive compounds as ANFO, a large excess of anti-caking agent is actually detrimental, since it can result in reductions in explosive efficiency. For most commercial purposes, it is desirable to use the anti-caking agent in amounts of from 0.01 to 0.5 percent, based on the weight of the prills.

Two methods are here disclosed for blending the prilled ammonium nitrate with the petroleum hydrocarbon and the anti-caking agent:

1. the petroleum hydrocarbon is first distributed and homogeneously mixed with the prilled ammonium nitrate in an available mixer, such as a rotary drum, and subsequently the anti-caking agent is distributed and mixed thereto in the same manner;

2. the petroleum hydrocarbon and anti-caking agent are simultaneously distributed and mixed homogeneously with the granular or prilled ammonium nitrate.

The prilled ammonium nitrate used in the present invention, may be either high density or low density prilled ammonium nitrate. However, the latter is more preferable when the prills are being used as raw materials in the preparation of such explosive compounds as ANFO. The lower the water content, the greater will be the anti-caking properties of the prilled ammonium nitrate. Normally, the prills are obtained by spraying a molten ammonium nitrate containing, for example, 2 to 10 percent, by weight, of water from the top of a prilling tower of several tens meters in height. The prills are then dried at a temperature of 80°-120°C. to obtain a low water content.

One method of efficiently drying the prills is, for example, to aerate the prills in an atmosphere of an inert gas, for example air, at a temperature of 40° to 90°C. and then, if necessary, adding a drying agent and sub-

jecting the prills to an aging treatment. Good results are attainable if the aeration is carried out at a temperature of 40° to 90°C., preferably 60° to 90°C. If the temperature is lower than 40°C., drying of the granulate will not be sufficiently complete. If higher temperatures are used, no significantly better results will be expected and it will merely be economically disadvantageous from the viewpoint of energy consumption. Aeration usually requires more than 5 minutes, and preferably between about 10 to 30 minutes. One method of effecting the above aeration, is for example, to place the ammonium nitrate onto a perforated plate, and fluidize it by air blasts from an aperture. Another suitable method is to pass the ammonium nitrate on a moving belt through an aeration room. Still another method is to pass air into a rotating rotary containing the prills. Of course, any conventional technique is also suitable. Suitable inert gases which can be used in this treatment include air, nitrogen, carbon dioxide, etc., although it is generally sufficient to use air. The required rate of inert gas is commonly greater than 10 cm/sec., and preferably within the range of 100 to 300 cm/sec. Although the lower the relative humidity of the inert gas the better it is, the relative humidity need only be below the critical humidity of the prilled ammonium nitrate. The favorable effect of aeration treatment is believed to be due to the fact that a relatively large size (10 to 20 $\mu$ ) aperture is formed on the surface layer of the ammonium nitrate particles due to the contact with inert gas. The permeation of the drying aid into the interior of the ammonium nitrate particle, therefore, is quite easy. The aerated prill is preferably subsequently admixed with the drying aid.

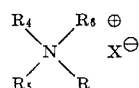
Suitable drying aids used herein include, for example,

1. the amines represented by the formula:



(wherein R represents a saturated or unsaturated chain hydrocarbon radical having eight to 18 carbon atoms) or its derivative, or, forms an inorganic or organic salt of said amines, preferably an amine nitrate;

2. quaternary ammonium salts represented by the formula:



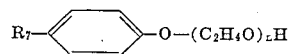
, wherein  $R_4$ ,  $R_5$  and  $R_6$  each represent methyl or ethyl, and X represents chlorine or bromine, and R is as defined above;

3. polyoxyethylene alkyl ethers represented by the formula:



, wherein R is as defined above, and n is an integer of one to 20;

4. polyoxyethylene alkyl phenylethers represented by the formula:

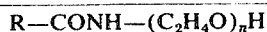


wherein  $R_7$  is an alkyl group having eight to nine carbon atoms;

5. sulfuric acid ester salts of higher alcohols, represented by the formula:

, wherein R is as defined above;

6. polyoxyethylene alkyl amides represented by the formula:



, wherein R is as defined above;

7. polyoxyethylene sorbitane alkyl esters;

8. polyoxyethylene oxypropylene triols;

9. hydroxyethylene hydroxypropylene triols;

10. alkyl pyridinium salts;

11. higher fatty acid amide sulfonate;

12. higher fatty acid esters of polyethyleneglycol;

13. higher fatty acid esters of sorbitane;

14. polyoxyethylene alkylamine;

15. a betaine type of amphoteric surface active agent;

16. an acyl pyridinium salt; and mixtures thereof.

Prilled ammonium nitrate is prevented from partially powdering during the drying step by using one of these drying aids. Particularly good results are attained with alkylamine or its salts, shown in (1). The result is that prilled ammonium nitrate having improved anti-scattering property is obtained, in good yields.

Exemplary of suitable drying agents include dodecylamine or its nitrate, octadecylamine or its nitrate, lauryltrimethylammonium-chloride, polyoxyethylenestearylether, polyoxyethyleneoctylether, polyoxyethylene nonylether, polyoxyethylene sorbitane monooleate, laurylpicolinium chloride, sodium laurylsulfate, sodium octylsulfate, polyoxyethylene octylamide, polyoxyethylene stearylamine, oleic acid amide, sodium sulfonate, polyethyleneglycol monostearate, sorbitan monostearate, polyoxyethylene octadecylamine, laurylbetain, acetylpyridium chloride, etc.

Although these drying agents may be used in any concentration in a solution, such as, for example, an aqueous solution, alcohol solution, or benzene solution, they are desirable used as a solution in amounts of 1 to 10 percent, by weight, in concentration, in order to be uniformly distributed over the ammonium nitrate. The amount of drying aid should be added in amounts of from 0.01 to 1.0 percent and preferably 0.02 to 0.06 percent based on the weight of the prilled ammonium nitrate. If one of the above alkylamines or salts thereof are used, it is used in amounts of 0.2 to 0.5 percent, by weight. The drying aid may be introduced by being sprayed onto the particle surface of the prilled ammonium nitrate. This is accomplished, generally in a suitable mixer, such as a rotary drum, or the like. This spray adding may be carried out stepwise, once, twice,

or more times, in order to permeate the solution of the drying agent sufficiently into the interior of entire particles. Further, the addition of the drying agent may be done either immediately after the aeration treatment, i.e., while the particles are still at elevated temperatures, or after the particles are cooled to room temperatures.

When the above prill is subjected to aging treatment after admixing the drying agent therewith, the water content of the prilled ammonium nitrate becomes greatly reduced. The purpose of the aging treatment is to permeate the drying agent from the surface of the ammonium nitrate prill sufficiently into the interior thereof. Aging is preferably effected by stirring or mixing the particles with the drying aid, using, for instance, a rotating vessel or the like in the absence of air. The aging treatment is preferably carried out at temperatures of 50° to 80°C. for about 5 to 30 minutes.

As described above, after aeration, the prilled ammonium nitrate which has been admixed with the drying agent and, if necessary, has been aging treated, is subjected to further drying. This drying treatment is preferably carried out at temperatures of from 60° to 100°C., or higher than that in the above aeration treatment, for 10 to 30 minutes. This step should preferably be carried out by fluidizing the particles in an atmosphere of inert gas, such as air, nitrogen, or carbon dioxide. The velocity of the gas should be greater than 10 cm/sec., and, preferably, between 100 and 300 cm/sec.

The present invention will now be further illustrated by reference to the following Examples by which the present invention is not intended to be limited unless otherwise so specified.

#### EXAMPLE 1

One Kg of prilled ammonium nitrate, containing 3.2 percent by weight, of water was aerated at 80°C., and 5% %H, in a velocity of 1.5 m/sec. for 20 minutes. An aqueous solution of 3%, by weight, of drying agent as shown in Table I was added thereto by spraying under mixing in a pan type pelletizer. Next, the mixture was dried by fluidized treatment under the same conditions as in the above aeration for 20 minutes and then was fluidized in a stream of dehydrated air at 15°C. for 10 minutes where it was cooled at room temperature. To the prilled ammonium nitrate thus obtained, 0.1 percent, by weight, of magnesium stearate and 0.1 percent, by weight, of liquid paraffin (b.p. Ca 300°C., m.p. less than -30°C.) were admixed to form suitable samples. The anti-caking and anti-scattering percentages were determined, and the result is reported in Table I.

TABLE I

Drying aid		Amount added (cc.)	Anti-caking (percent)	Anti-scattering grade	Water content (wt. percent)
Test No.:					
1.....	Stearyl trimethyl ammonium chloride.....	20	95	1	0.028
2.....	Polyoxy ethylene stearyl ether.....	20	96	1	0.025
3.....	Polyoxy ethylene nonylphenylether.....	20	96	1	0.021
4.....	Lauryl alcohol sodium sulfate ester.....	20	94	1	0.032
5.....	Polyoxyethylene octylamide.....	20	95	1	0.027
6.....	Polyoxyethylene sorbitan monooleate.....	20	94	1	0.035
7.....	Polyoxyethylene hydroxypropylene triol.....	20	93	1	0.039
8.....	Hydroxyethylene-hydroxy-propylene block copolymer.....	20	95	1	0.032
9.....	Laurylpicolinium chloride.....	20	96	1	0.024
10.....	Polyoxyethylene octadecylamine.....	20	93	1	0.039
11.....	Lauryl betain.....	20	93	1	0.031
12.....	Sodiumsulfonate oleic acid amide.....	20	96	1	0.024
13.....	Polyethyleneglycol monostearate.....	20	95	1	0.033
14.....	Sorbitan monooleate.....	20	92	1	0.046
15.....	Acetylpyridium chloride.....	20	94	1	0.037
16.....	Octadecylamine butyrate.....	20	100	1	0.036
17.....	Dodecylamine butyrate.....	20	99	1	0.021
18.....	Octylamine butyrate.....	20	99	1	0.030
19.....	10% aqueous suspension of dodecylamine.....	20	100	1	0.046
20.....	Octadecylamine nitrate.....	20	98	1	0.026
21.....	No additive (control).....	0	0	1	1.860

## EXAMPLE 2

Prilled ammonium nitrate containing 3.4 percent, by weight, of water was aerated at the temperature and time as shown in Table II, and then 20 cc. of an aqueous solution of 3 percent, by weight, of octadecylamine nitrate (Sample Nos. 1 to 6) or dodecylamine nitrate (Sample Nos. 7 to 10) were added thereto by spraying while mixing in a pan type pelletizer. After fluid drying with air of 1.5 m/sec. at a velocity under the conditions as shown in Table II, the mixture was fluidized in a stream of dehydrated air at about 15°C. for 10 minutes to effect cooling at room temperature. To the dried, prilled ammonium nitrate, thus obtained, 0.1 percent, by weight, of magnesium stearate and 0.1 percent, by weight, of liquid paraffin (b.p. Ca 300°C., m.p. less than -30°C.) were added and mixed to form the samples. These samples were subjected to the same tests as in Example 1 to give the results as shown in Table II.

TABLE II

Sample No.	Aeration		Drying		Anti-caking percentage	Anti-scattering grade	Water content (wt. percent)
	Temp. (° C.)	Time (min.)	Temp. (° C.)	Time (min.)			
1.....	70	10	80	20	100	1	0.031
2.....	80	10	80	20	100	1	0.034
3.....	70	10	80	10	96	1	0.060
4.....	70	10	80	30	100	1	0.028
5.....	70	10	95	20	99	1	0.040
6.....	70	10	70	20	100	1	0.031
7.....	40	10	80	20	99	1	0.040
8.....	60	10	80	20	100	1	0.025
9.....	80	10	80	20	100	1	0.025
10.....			80	20	87	1	0.120

## EXAMPLE 3

One Kg of prilled ammonium nitrate containing 3.4 percent, by weight, of water was aerated at 80°C. for 20 minutes, and then 15 cc of an aqueous solution of 4 percent, by weight, of octadecylamine nitrate was added thereto by spraying while mixing, in a pan type of pelletizer and the mixture was subjected to aging for the times shown in Table III. Next, after drying by passing air at 80°C. in a line velocity of 1.5 m/sec. for 20 minutes, the mixture was fluidized in a stream of dehydrated air at about 15°C. for 10 minutes to effect cooling at room temperature. To the prilled ammonium ni-

trate, thus obtained, 0.1 percent, by weight, of magnesium stearate and 0.1 percent, by weight, of liquid paraffin (b.p. Ca 300°C., m.p. less than -30°C.) were added and mixed to form samples. These samples were subjected to the same tests as in Example 1 with the results as shown in Table III.

TABLE III

Aging time (min.)	Anti-caking (%)	Anti-scattering grade	Water content (wt. %)
0	95	1	0.064
1	97	1	0.054
3	98	1	0.048
5	100	1	0.036

## EXAMPLE 4

One Kg of prilled ammonium nitrate containing 3.4 percent, by weight, of water was dried at 70°C. for 30 minutes after adding 4 g. of octadecylamine nitrate as

a 4 percent aqueous solution. It was then fluidized in a stream of dehydrated air at 15°C. for 10 minutes to effect cooling at room temperature. After adding 1 g. of liquid paraffin (b.p. Ca 300°C., m.p. less than -30°C.) to the prilled ammonium nitrate, thus obtained, while mixing in a pan type pelletizer, an anti-caking agent, as shown in Table IV was added thereto and mixing was continued for more than 5 minutes to prepare Sample A. For comparison, Sample B was similarly prepared without adding a petroleum hydrocarbon. The anti-caking percentage, anti-scattering percentage and adhering percentages were determined on these samples, with the results as shown in Table IV.

TABLE IV

Kind	Anti-caking agent	Added amount (wt. percent)	Anti-caking percentage		Anti-scattering grade		Adhering percentage
			Sample A	Sample B	Sample A	Sample B	
Magnesium stearate.....		0.1	87	80	1	5	97
Do.....		0.2	93	86	1	5	95
Do.....		0.5	100	100	1	5	92
Copper stearate.....		0.1	80	71	1	5	95-97
Zinc stearate.....		0.1	78	70	1	5	95-97
Calcium stearate.....		0.1	60	55	1	5	95-97
Lead stearate.....		0.1	60	51	1	5	95-97
Aluminum stearate.....		0.1	80	70	1	5	95-97
Barium stearate.....		0.1	40	36	1	5	95-97
Cadmium stearate.....		0.1	50	42	1	5	95-97
Magnesium caprate.....		0.2	70	60	1	5	95-97
Magnesium undecanoate.....		0.2	60	50	1	5	95-97
Magnesium aluminate silicate (Al <sub>2</sub> O <sub>3</sub> -MgO-2SiO <sub>2</sub> -4H <sub>2</sub> O).....		0.5	85	85	1	5	92
Do.....		0.1	20	15	1	5	95-97
Methylene bisstearoamide.....		0.5	100	100	2	5	93
Do.....		0.1	85	70	1	5	95
Ethylene bisstearoamide.....		0.5	100	97	1	5	92
Methylene bispalmitoamide.....		0.5	100	93	1	5	92
Methylene biscaprilamide.....		0.5	93	93	1	5	92
No additive.....			0	0	1	5	-----

EXAMPLE 5

A sample was prepared in the same manner as in Example 4 by using 1 g. of petroleum hydrocarbon shown in Table II and 5 g. of magnesium stearate, as an additive for the prilled ammonium nitrate, similarly obtained as in Example 4. These samples were subjected to the same tests as in Example 4 to yield the following result as shown in Table V.

TABLE V

Petroleum hydrocarbon	Anti-caking percentage	Anti-scattering percentage	Adhering percentage
Liquid petrolatum (m.p. 4.4°C., b.p. more than 320°C.)	96	1	97
No additive	87	5	60
Molten solid paraffin (m.p. 50°C., b.p. 300 to 380°C.)	87	3	74

All tests on anti-caking percentage, anti-scattering percentage and adhering percentage of fine powder described in the Examples were conducted by the following methods:

1. Anti-scattering percentage of fine powder

Five hundred g. of sample prepared in each example are allowed to naturally fall from a height of 0.5 meter onto a screen of 3 mm. and the scattering state of fine powder was rated by the following five grades:

1. No scattering;
2. Slight scattering;
3. Scattered;
4. Vigorously scattered; and
5. Extremely vigorously scattered.

2. Anti-caking percentage

Three hundred g. of sample prepared are introduced into a highly rigid polyvinyl chloride vessel ( $\phi$  10 x h 10 cm) and, after placing a load of 0.2 Kg/cm<sup>2</sup>, was sealed by a polyethylene bag. The sample was subjected to a thermal treatment for 5 days, the treating temperature being raised from 20° to 45°C. over a period of half a day and then reduced again to 20°C. over another one-half day. After the above mentioned treatment, the sample was broken by means of a Tensilon (UTM-III type made by Toyo Sokki Co.). Anti-caking percentage is indicated by the destructive load required to break the sample thus obtained with anti-caking 100 percent when load 0 Kg/cm<sup>2</sup> and 0 percent when 5 Kg/cm<sup>2</sup>.

3. Adhering percentage

Sample prepared in each example is sifted through a 0.42 mm screen. The adhered amount of anti-caking agent is measured on the sample of the above screen by

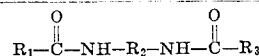
atomic absorption analysis, and then the proportion of the amount to that of charged anti-caking is given with percentage.

Having now fully described the invention, it will be apparent to one of ordinary skill in the art that many changes and modifications can be made thereto without departing from the spirit or scope of the invention as set forth herein. Accordingly,

What is claimed and intended to be covered by Letters patent is:

1. A prilled ammonium nitrate composition having improved anti-caking and anti-scattering properties which comprises a blend of prilled ammonium nitrate with (1) a petroleum hydrocarbon having a boiling point of greater than 150° C and a melting point of less than 20° C and (2) at least one anti-caking agent selected from the group consisting of:

- a. magnesium, barium, lead, calcium, zinc, copper, aluminum and cadmium salts of fatty acid having seven to 22 carbon atoms and a melting point of more than 40° C;
- b. magnesium aluminate silicate; and
- c. a compound represented by the formula:



wherein R<sub>1</sub> and R<sub>3</sub> each represent an alkyl group having 10 to 20 carbon atoms and R<sub>2</sub> represents an alkylene group having one to two carbon atoms, with the amount of said petroleum hydrocarbon being 0.05 to 1.0 percent based on the weight of prilled ammonium nitrate.

2. The prilled ammonium nitrate composition of claim 1, wherein said anti-caking agent is blended in amounts of 0.01 to 0.5 percent based on the weight of prilled ammonium nitrate.

3. The prilled ammonium nitrate composition of claim 1, wherein said petroleum hydrocarbon has a melting point of less than 0° C.

4. The prilled ammonium nitrate composition of claim 1, wherein said anti-caking agent is selected from the group consisting of magnesium-, copper-, zinc-, calcium-, lead-, aluminum-, barium-, and cadmium-stearates, magnesium caprate, and magnesium undecanate.

5. The prilled ammonium nitrate composition of claim 4, wherein said anti-caking agent is magnesium stearate.

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