

UNITED STATES PATENT OFFICE

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PYROTECHNIC COMPOSITIONS

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6 Claims. (Cl. 52—23)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manu-
factured and used by or for the Government for
governmental purposes, without the payment to
me of any royalty thereon.

This invention relates generally to pyrotechnic
compositions, and more particularly it has refer-
ence to a composition in which an insoluble soap
is employed as a waterproofing agent for the pur-
pose of prolonging its storage life.

The problem of increasing the stability of
pyrotechnic compositions is especially important
in the case of tracer ammunition where the com-
position is exposed to the moist air in the
cartridge case. Propellant powders in current
use contain approximately 1% moisture, and in
a closed space, the air in contact with the powder
contains enough moisture to produce a relative
humidity of 70% to 90%. When easily oxidized
metallic fuels are present in the composition, such
as magnesium, deterioration may be rapid
enough to render the ammunition useless within
a few years.

I have found that pyrotechnic compositions
will show a marked resistance to the effects of
humid air when they include a small quantity of
an insoluble soap. For example, a composition
containing approximately 10% magnesium and
90% barium peroxide will be almost completely
stable in air of 90% relative humidity if from
0.5% to 2.5% zinc stearate is included. Zinc
stearate, however, is only one of many insoluble
soaps which may be used for this purpose. Some
of the better known are stearates of aluminum,
lead, magnesium, calcium, copper, and iron.
Such soaps can also be made from oleic or
palmitic acids. These latter soaps are soft, due
to a lower titre of the fatty acid and are conse-
quently not satisfactory for use with pyrotechnics.

Examples of compositions which have remained
stable in storage tests, are as follows:

	Percent	
Magnesium	20	
Barium peroxide	76	
Aluminum stearate	4	
Magnesium	24.	5
Barium peroxide	73.5	
Magnesium stearate	2.5	
Magnesium	5	-25
Barium peroxide	75	-95
Zinc stearate	0.5-10	10

The zinc soap is of more suitable density and,
therefore, can be more easily blended with other
ingredients. It is preferred for pyrotechnic use.

I claim:

1. A pyrotechnic composition comprising

	Percent	
Magnesium	5	-25
Barium peroxide	75	-95
Zinc stearate	0.5-10	20

2. A pyrotechnic composition comprising

	Percent	
Magnesium	5	-25
Barium peroxide	75	-95
An insoluble soap	0.5-10	25

3. A pyrotechnic composition comprising

	Percent	
Magnesium	5	-25
An alkaline earth peroxide	75	-95
An insoluble soap	0.5-10	30

4. A pyrotechnic composition comprising

	Percent	
A metallic fuel	5	-25
An alkaline earth peroxide	75	-95
An insoluble soap	0.5-10	35

5. A pyrotechnic composition containing a
metallic fuel, an alkaline earth peroxide and an
insoluble soap.

6. A pyrotechnic composition containing a
metallic fuel and an insoluble soap.

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