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3,147,162

ORGANIC EXPLOSIVE COMPOSITIONS SUITABLE
FOR WEAPON CASINGS

James T. Paul, Jr., Wilmington, Del., assignor, by mesne
assignments, to the United States of America as repre-
sented by the Secretary of the Navy
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1 Claim. (Cl. 149-19)

The invention described herein may be manufactured
and used by or for the Government of the United States
of America for governmental purposes without the pay-
ment of any royalties thereon or therefor.
This invention relates to explosive compositions, more
particularly, it relates to explosive compositions suitable
for fabricating high strength weapon casings.
The chief objective of the invention is the provision
of explosive compositions for use in fabricating weapon
casings. These compositions should provide a finished
article of high physical strength, low impact sensitivity,
and high density. Additionally, they should cure at low
temperatures.
It has been found that a suitable tough, flexible, high
explosive composition is obtained when polyvinyl chloride
or polyvinyl chloride-polyvinyl acetate plastic is filled
with a granular, high melting explosive such as cyclotri-
methylene trinitramine or pentaerythritol tetranitrate.
The composition is prepared by mixing an explosive filler
with a suspension of the polymeric material and a suitable
plasticizer, and curing the resulting mixture at a temper-
ature of from 270° to 350° F. The curing is a solution
process in which the vinyl component dissolves in the
plasticizer at the high temperature.
In addition to its explosive property, the formed product
is characterized by very high impact strength, high
physical strength and high density.
The following examples are illustrative of the inven-
tion but not limiting thereof.

Example 1

Component:	Wt. percent
Cyclotrimethylene trinitramine	70
Polyvinyl chloride	18
Dibutyl sebacate	12

The above mixture was cured from 5 to 7 minutes at
350° F.

Example 2

Component:	Wt. percent
Cyclotrimethylene trinitramine	60
Polyvinyl chloride	24
Diocetyl phthalate	16

The above mixture was cured at 350° F.

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Example 3

Component:	Wt. percent
Cyclotrimethylene trinitramine	50.00
Vinylite (VYNV)	30.05
Diocetyl sebacate	12.55
Dimethoxyethyl phthalate	7.40

The above mixture was cured for 15 minutes at 270°
F. The explosive compositions produced in the above
examples were characterized by high impact strength,
high physical strength and high density, making them
suitable for the fabrication of high strength weapon
casings.

From the above data it is seen that the invention pro-
vides compositions suitable for the manufacture of ex-
plosive weapon casings. The compositions can be cured
at low temperatures and the cured product has the re-
quired explosive characteristics, high density, and high
physical strength.

Obviously many modifications and variations of the
present invention are possible in the light of the above
teachings. It is therefore to be understood that within
the scope of the appended claim the invention may be
practiced otherwise than as specifically described. For
example, mixtures of the disclosed high explosives as
well as mixtures of the disclosed plastics and plasticizers
may be used.

What is claimed is:
An explosive composition for use in fabricating weapon
casings, comprising, from about 50 to about 70 percent
of a high explosive from the class consisting of cyclotri-
methylene trinitramine and pentaerythritol tetranitrate;
from about 18 to about 31 percent of a material from the
class consisting of polyvinyl chloride and polyvinyl chlo-
ride-polyvinyl acetate copolymer; and from about 7
to about 20 percent of a material from the class consist-
ing of dibutyl sebacate, diocetyl phthalate and diocetyl
sebacate; said composition being curable at a temperature
between about 270 to 350° F.

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