

United States Patent [19]

Johnson et al.

[11] Patent Number: 4,978,482 67880
[45] Date of Patent: Dec. 18, 1990[54] MELT CAST THERMOPLASTIC
ELASTOMERIC PLASTIC BONDED
EXPLOSIVE[75] Inventors: Nancy C. Johnson, Waldorf; Robert
C. Gill, White Plains; John F. Leahy,
Bowie; Carl Getzner, Jr., Accokeek;
Harold T. Fillman, Bowie, all of Md.[73] Assignee: The United States of America as
represented by the Secretary of the
Navy, Washington, D.C.

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149/19.91; 149/19.92

[58] Field of Search 149/19.9, 19.92, 19.91;

264/3.1

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Primary Examiner—Edward A. Miller
 Attorney, Agent, or Firm—Kenneth E. Walden; Roger
 D. Johnson

[57] ABSTRACT

A method of melt casting plastic bonded explosives by:
 A. forming a uniform binder mixture of the following
 ingredients

- (1) from 10 to 30 weight percent of a triblock poly-
 mer of the formula A-B-A wherein A represents
 a polystyrene block and B represents an elasto-
 meric midblock which is selected from the group
 consisting of polybutadiene, polyisoprene, and
 polyethylenebutylene; and
- (2) From 70 to 90 weight percent of a low viscosity
 oil selected from the group consisting of naph-
 thenic, paraffinic, and olefinic oils
 by mixing the ingredients under low-shear condi-
 tions at a temperature of from 80° C. to 110° C.;
- B. mixing an energetic filler into the binder mixture
 under low shear conditions and at a temperature of
 from 80° C. to 110° C., provided that the viscosity
 of the mixture does not exceed 20 kilopoise;
- C. pouring the energetic filler-binder mixture formed
 in step B into a mold; and
- D. cooling energetic filler-binder mixture to form a
 solid explosive composite.

Rubber phase associating and polystyrene phase asso-
 ciating hot melt resins may also be used in the binder
 mixture to improve the physical properties of the final
 plastic bonded explosive composite

19 Claims, No Drawings

OPTIONAL FORM 99 (7-80)

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