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(12) **United States Patent**  
**Bruno et al.**

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(54) **MULTI-ACTION FUZE AND WARHEAD SEPARATOR FITTED TO A MUNITION**

USPC ..... 102/481, 202.1, 293; 220/89.4  
See application file for complete search history.

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 6 days.

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**Related U.S. Application Data**

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(57) **ABSTRACT**

(51) **Int. Cl.**  
*F42B 39/20* (2006.01)  
*F42C 15/34* (2006.01)  
*F42B 15/36* (2006.01)

A multi-step separator for a fuze is configured to be mated to an explosive device in a military munition, either at a production facility during manufacture of the munition or during use in the field. The fuze includes a detonator with a booster or spit-back element for initiating an energetic sequence resulting in a high-order detonation of the explosive device. The multi-step separator includes:

(Continued)

(52) **U.S. Cl.**  
CPC ..... *F42C 15/34* (2013.01); *F42B 15/36* (2013.01); *F42B 39/14* (2013.01); *F42B 39/20* (2013.01); *F42C 15/44* (2013.01)

(a) a fuze-munition interface device for retaining the fuze in a confined, close relationship with the explosive device and for releasing the fuze when and if it is subjected to an external stimulus that may cause it to detonate the explosive device; and

(58) **Field of Classification Search**  
CPC ..... F42B 39/00; F42B 39/20; F42B 33/0278; F42B 15/36; F42B 39/14; F42C 15/34; F42C 15/44; F42C 15/36; F42C 19/02

(b) a separating device for physically distancing the fuze from the explosive device when and if the fuze is released.

**11 Claims, 13 Drawing Sheets**

