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**United States Patent**

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US 006 796 382

(12) **United States Patent**  
**Kalmart**(11) Patent No.: **US 6,796,382 B2**  
(13) Date of Patent: **Sep. 28, 2004**(54) **FIRE EXTINGUISHING BALL.**(57) Inventor: **Wardach Kalmart, Durgleming (TH)**(51) Assignee: **Siam Safety Premier Co., Ltd.,**  
**Chonburi (TH); Siam Safety Engine**  
**Co., Ltd., Chonburi (TH)**

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(k) by 0 days.

(21) Appl. No.: **09/995,246**(22) Filed: **Jul. 2, 2001**(52) **Priority Publication Data**

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(31) Int. Cl.<sup>7</sup> **A62C 26/02, A62C 13/02,**  
**A62C 3/00**(52) U.S. Cl. **169/43, 169/28, 169/55,**  
**169/56, 169/20**(58) **Field of Search** **169/55, 30, 28,**  
**169/28, 43**(59) **References Cited****U.S. PATENT DOCUMENTS**

798,622 A *	9/1900	Pauls et al.	149/36
875,476 A *	11/1907	Stanley	139/72
1,058,572 A *	9/1933	Boady	149/26
1,482,532 A *	3/1936	Murphy	149/28
1,565,626 A *	12/1937	Leak	149/20
2,306,321 A *	12/1942	Rubens	102/369
2,750,547 A *	8/1956	Zalovick	149/31
3,873,866 A *	2/1979	Ritter	102/368
3,666,287 A *	5/1969	Frost	
3,873,867 A *	9/1974	Williams	149/28

3,986,139 A *	8/1976	Kirk	
4,384,469 A *	10/1980	Smith	
5,232,034 A *	8/1993	Collin	
5,580,455 A *	12/1996	Sponer et al.	
5,854,881 A *	4/1999	Kononov et al.	
5,854,882 A *	4/1999	Hong	
6,012,331 A *	10/2000	Ryan	
6,050,341 A *	4/2000	Garcia Calvo	149/36
6,096,863 A *	5/2000	Hong	

\* cited by examiner

Primary Examiner—**Ralph G. Evans**(74) Attorney, Agent, or Firm—**Stern, Kessler, Goldstein**  
**& Fox, P.L.L.C.**(57) **ABSTRACT**

A fire extinguishing device of the explosive type is disclosed for use in linear or localized exterior configurations, wherein the force of detonation of the device is minimized through the use of low density/low mass components; no part of the device having sufficient mass or density to typically constitute a safety hazard in flying debris, nor be dangerous in concussive shock due to the explosive force. The present invention is composed of a lightweight casing of rigid plastic resin or other suitably fragile material, with an abrasion-resistant, thin plastic, protective, exterior cladding. Within the internal cavity of the device, a low explosive yield detonator is located at or near the center of mass, and is actuated by fuse (wire) extending from the detonator, the axis of which extends from the interior detonator to a mounting at or near the exterior surface. The interior volume of the hollow casing is chargeable, through variations in internal configuration, with a variety of fire-retardant chemical agents, including dry powders, two-part treatments, liquid components or ethan, singly or in combination.

**23 Claims, 8 Drawing Sheets**