



US006112635A

United States Patent [19]

[11] Patent Number: **6,112,635**

Cohen

[45] Date of Patent: ***Sep. 5, 2000**

[54] **COMPOSITE ARMOR PANEL**

2 711 782 A1 5/1995 France .
2711782 5/1995 France .

[75] Inventor: **Michael Cohen**, Mobile Post North
Yehuda, Israel

(List continued on next page.)

[73] Assignee: **Mofet Etzion**, Israel

OTHER PUBLICATIONS

[*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

International Search report (2 pgs) conducted by the European Patent Office; File No. RS 96807; dated Jun. 27, 1996.
International Search report (2 pgs) conducted by the European Patent Office; dated May 14, 1998, Related to EP 98 30 1769.

This patent is subject to a terminal disclaimer.

Plasan Sasa Plastic Products, Price List, Mar. 31, 1998.
Coors Porcelain Company Brochure, 1 page.
Ballistic Materials and Penetration Mechanics, Chapter 6, Roy C. Laible, pp. 135-142, 1980.
14th International Symposium on Ballistics, Quebec, Canada, The Performance of Lightweight Ceramic Faced Armour Under Ballistic Impact, Drs. C. Navarro, M.A. Martinez, R. Cortes and V.Sanchez-Galvez, pp. 573-577, Sep. 1993.

[21] Appl. No.: **09/048,628**

[22] Filed: **Mar. 26, 1998**

Coors Ceramic Company, Armor Products Brochure, Coors Alumina Armor Materials, Data Sheet 52-96, 2 pages, 1990.
Alumina, Processing, Properties and Applications, E. Dorre & H. Hubner, pp. 278-283, 1984.

Related U.S. Application Data

[63] Continuation-in-part of application No. 08/704,432, Aug. 26, 1996, Pat. No. 5,763,813.

Rafael, System Concept of Applique Flexible Ceramic Armor (FCA), Technical Proposal, pp. 3-41, Jun. 1993.

[51] **Int. Cl.**⁷ **F41H 5/04**

[52] **U.S. Cl.** **89/36.02**; 428/911

[58] **Field of Search** 89/36.01, 36.02;
109/82, 83, 84; 428/911

Primary Examiner—Stephen M. Johnson
Attorney, Agent, or Firm—Fulbright & Jaworski L.L.P.

[56] References Cited

[57] ABSTRACT

U.S. PATENT DOCUMENTS

3,523,057	8/1970	Buck	89/36.02
3,705,558	12/1972	McDougal et al.	109/84
4,061,815	12/1977	Poole, Jr.	428/312
4,131,053	12/1978	Ferguson	109/82
4,179,979	12/1979	Cook et al.	109/49.5
4,602,385	7/1986	Warren	2/2
5,134,725	8/1992	Yeshurun et al.	428/911
5,361,678	11/1994	Roopchand et al.	89/36.02
5,763,813	6/1998	Cohen et al.	89/36.02

The invention provides a composite armor plate for absorbing and dissipating kinetic energy from high velocity, armor-piercing projectiles, the plate comprising a single internal layer of high density ceramic pellets which are directly bound and retained in plate form by a solidified material such that the pellets are bound in a plurality of adjacent rows, characterized in that the pellets have an Al₂O₃ content of at least 93% and a specific gravity of at least 2.5, the majority of the pellets each have at least one axis of at least 12 mm length and are bound by the solidified material in a single internal layer of adjacent rows, wherein a majority of each of the pellets is in direct contact with at least 4 adjacent pellets, and the solidified material and the plate are elastic.

FOREIGN PATENT DOCUMENTS

0 499 812 A1	8/1992	European Pat. Off. .
816814	8/1937	France .
1566448	5/1969	France .
2559254	8/1985	France .

16 Claims, 3 Drawing Sheets

