US007730557B1

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

(10) **Patent No.: US 7,730,557 B1**
(45) **Date of Patent: Jun. 8, 2010**

(54) **COOLED PROTECTIVE GARMENT**

(75) Inventors: **Mark J. Courtney**, Middletown, DE (US); **William J. Gorak**, Newark, DE (US); **Gregory D. Culler**, Nottingham, PA (US); **Christopher S. Weyl**, Newark, DE (US)

(73) Assignee: **Gore Enterprise Holdings, Inc.**, Newark, DE (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1014 days.

(21) Appl. No.: **11/397,079**

(22) Filed: **Apr. 3, 2006**

(51) **Int. Cl.**
A62B 17/00 (2006.01)

(52) **U.S. Cl.** **2/458**

(58) **Field of Classification Search** 2/102, 2/458, 69, 81, 93, 97, 272, 275
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

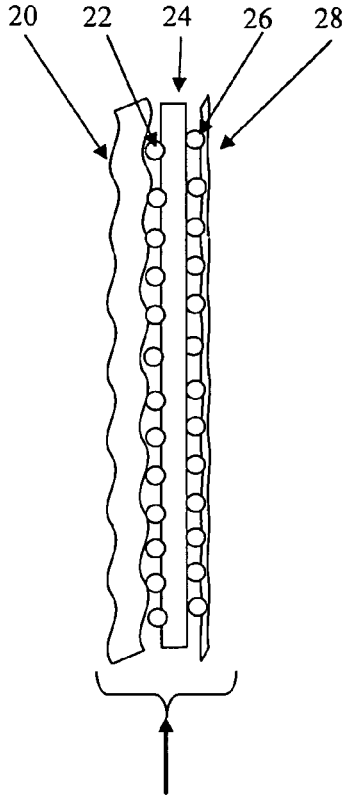
4,816,330 A 3/1989 Freund et al. 428/286
4,831,664 A 5/1989 Suda 2/2
5,017,424 A 5/1991 Farnworth et al. 428/230
5,263,336 A 11/1993 Kuramarohit 62/259.3
5,626,947 A 5/1997 Hauer et al. 428/195
6,371,977 B1 4/2002 Bumbarger et al. 607/108
6,473,910 B2 11/2002 Creagan et al. 2/458

FOREIGN PATENT DOCUMENTS

WO WO/92/22354 12/1992

Primary Examiner—Tejash Patel
(74) *Attorney, Agent, or Firm*—Dianne Burkhard

(57) **ABSTRACT**

A chemical protective garment or ensemble is disclosed that comprises a impermeable, protective cooling laminate having a water-holding layer for holding and evaporating liquid, and a chemical barrier. The water-holding layer has a water-holding capacity of at least about 5% wt., and the suit is designed to retain sufficient liquid to provide cooling to a wearer upon evaporation of the liquid from the suit.

70 Claims, 8 Drawing Sheets