



90002-6
1902

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶: H05B 3/40	A1	(11) International Publication Number: WO 98/24269 (43) International Publication Date: 4 June 1998 (04.06.98)
(21) International Application Number: PCT/US97/21711 (22) International Filing Date: 20 November 1997 (20.11.97) (30) Priority Data: 08/755,836 26 November 1996 (26.11.96) US (71) Applicants: ENERGY CONVERTORS, INC. [US/US]; Lower Demunds Road, Dallas, PA 18612 (US). RHEEM MANUFACTURING COMPANY [US/US]; 405 Lexington Avenue, New York, NY 10174-03017 (US). (72) Inventors: ECKMAN, Charles, M.; 11 Rice Drive, Dallas, PA 18612 (US). RODEN, James, S.; 141 Tensaw Road, Montgomery, AL 36117 (US). (74) Agent: JENKINS, Marylee; Robin, Blecker, Daley & Driscoll, 330 Madison Avenue, New York, NY 10017 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>

(54) Title: POLYMERIC IMMERSION HEATING ELEMENT WITH SKELETAL SUPPORT**(57) Abstract**

Electrical resistance heating element, hot water heaters containing such elements, and method of preparing such elements are provided. The electrical resistance heating elements can be disposed through a wall of a tank for heating fluid, such as water. They include a skeletal support frame (70), having a first supporting surface (69), thereon. They also include a resistance wire (66) wound onto the first supporting surface (69) and preferably connected to at least a pair of terminal end portions. The support frame (70) and resistance wire (66) are then hermetically encapsulated and electrically insulated within a thermally conductive polymeric coating (64). The skeletal support frame (70) improves injection molding operations for encapsulating the resistance wire (66), and can include heat transfer fins (62) for improving thermal conductivity.

