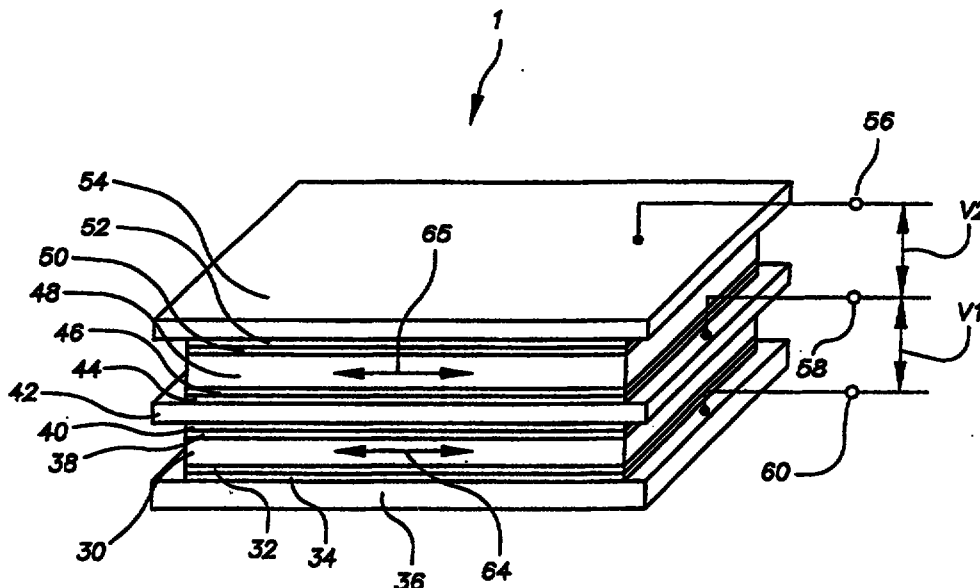




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H01L 41/107	A1	(11) International Publication Number: WO 98/54766 (43) International Publication Date: 3 December 1998 (03.12.98)
(21) International Application Number: PCT/US98/10660 (22) International Filing Date: 26 May 1998 (26.05.98) (30) Priority Data: 08/864,029 27 May 1997 (27.05.97) US (71)(72) Applicant and Inventor: BISHOP, Richard, Patten [US/US]; P.O. Box 10469, Burke, VA 22009 (US). (74) Agent: CLARK, Stephen, E.; Face International Corp., P.O. Box 6389, Norfolk, VA 23508 (US).	(81) Designated States: AL, AU, CA, CN, CU, CZ, GE, HU, IL, IS, JP, KP, LK, LR, LT, LV, MG, MK, MX, NO, NZ, PL, SG, SI, SK, TR, TT, UA, US, UZ, VN, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, 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 With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	

(54) Title: MULTI-LAYER PIEZOELECTRIC TRANSFORMER



(57) Abstract

A multi-layer piezoelectric transformer device (1) includes first and second electroactive members (30, 48) having electrodes (32, 38, 46, 50) bonded to each of their opposing major faces; and a bonding layer (34, 40, 44, 52) disposed therebetween. The first and second electroactive members (30, 48) are polarized in a thickness direction, between their two major faces, such that when energized by an electric field the first and second electroactive members (30, 48) longitudinally strain. The first and second electroactive members (30, 48) are arranged such that deformation of one electroactive member (30) results in corresponding deformation of the other electroactive member (48). The device provides substantial transformation ratios in which relatively high power may be transferred in relation to the size of the unit, operability over wide input and output frequency bandwidths, and electrical isolation of the voltage and current at the input to the device from the voltage and current at the output of the device.