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(54) **MULTILEVEL CONVERTER BASED INTELLIGENT UNIVERSAL TRANSFORMER**

(75) Inventors: **Jih-Sheng Lai**, Blacksburg, VA (US);
Arshad Mansoor, Oak Ridge, TN (US);
Arindam Maitra, Knoxville, TN (US);
Frank Goodman, Palo Alto, CA (US)

(73) Assignee: **Electric Power Research Institute, Inc.**, Palo Alto, CA (US)

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Primary Examiner—Adolf Berhane

(74) Attorney, Agent, or Firm—Morgan, Lewis & Bockius LLP

(57) **ABSTRACT**

A multilevel converter-based, intelligent, universal transformer includes back-to-back, interconnected, multi-level converters coupled to a switched inverter circuit via a high-frequency transformer. The input of the universal transformer can be coupled to a high-voltage distribution system and the output of the universal transformer can be coupled to low-voltage applications. The universal transformer is smaller in size than conventional copper-and-iron based transformers, yet provides enhanced power quality performance and increased functionality.

16 Claims, 11 Drawing Sheets

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(58) **Field of Classification Search** 363/17,
363/34, 37, 132; 307/82

See application file for complete search history.

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