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Lu

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- (54) **HARMONIC FILTERING CIRCUIT WITH SPECIAL TRANSFORMER**
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- (*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 5 days.

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- (52) **U.S. Cl.** 336/212; 336/217; 336/165; 336/170; 336/178; 336/215; 323/309; 323/306; 323/308; 323/248
- (58) **Field of Search** 336/217, 165, 336/170, 178, 215; 323/309, 306, 308, 248

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(57) **ABSTRACT**

A filter uses a special autotransformer that has a ferromagnetic core with a plurality of legs and flux return bars. A first coil is located on one leg, and a second coil is located on the same leg, but spaced from the first coil. The first coil and at least part of the second coil are connected in series to receive distorted alternating current and at least that part of the second coil is connected to an output terminal. Between the coils and extending at least part of the way from the first leg to an adjacent leg is a magnetic shunt assembly to divert part of the flux generated in the first coil by the alternating current so that that part does not link with the second coil. An air gap is located to link with the second coil to create an inductor in that coil by flux in the second coil, and a capacitor is connected across the second coil to tune it to the fundamental frequency of the alternating current and substantially reduce harmonics in that current.

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21 Claims, 9 Drawing Sheets

