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(54) **Transformer with controlled interwinding coupling and controlled leakage inductances and circuit using such transformer**

(57) A transformer in which a magnetic medium provides flux paths within the medium, two or more windings enclose the flux paths at separated locations along the paths, and an electrically conductive medium, arranged in the vicinity of the magnetic medium and the windings, defines a boundary within which flux emanation from the magnetic medium and the windings is confined and suppressed. In a transformer constructed in accordance with the present invention, both controlled values of leakage inductance and the benefits of sepa-

rated windings can be achieved. The conductive medium can be configured to reduce the leakage inductance of a controlled-leakage inductance transformer (e.g. for use in a zero-current switching power converter), having separately located windings, by at least 25%, and can be configured to reduce the leakage inductance of a low-leakage inductance transformer (e.g. for use in a PWM power converter), having separately located windings, by at least 75%.

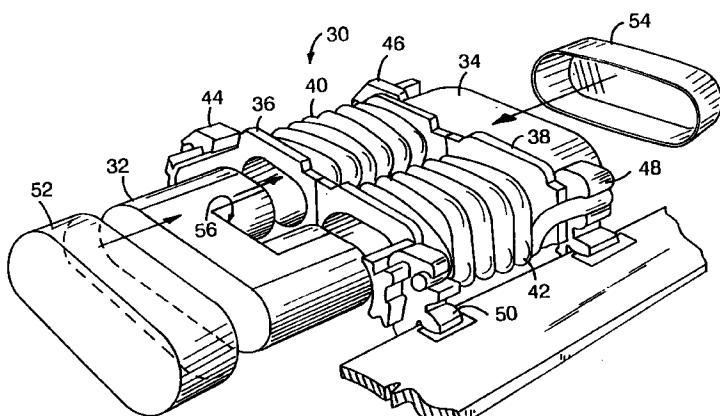


FIG. 7a



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## EUROPEAN SEARCH REPORT

**Application Number**

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	US 4 891 620 A (CHENG BRUCE C H) 2 January 1990 * column 2, line 25 - line 50; figures 2-4 * --- FR 2 558 639 A (THOMSON CSF MAT TEL) 26 July 1985 * abstract; figure *	1	H01F27/36 H01F41/00
A	DE 516 309 C (KOCH & STERZEL) 22 January 1931 * page 2, line 5 - line 38; figures * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			H01F
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	11 June 1998	MARTI ALMEDA, R	
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone	T : theory or principle underlying the invention		
Y : particularly relevant if combined with another document of the same category	E : earlier patent document, but published on, or after the filing date		
A : technological background	D : document cited in the application		
O : non-written disclosure	L : document cited for other reasons		
P : intermediate document	& : member of the same patent family, corresponding document		

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number  
EP 98 10 2797

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claim : 1

PROCESS OF MAKING TRANSFORMER AUTOMATICALLY BY INSERTING IN  
TWO HOLLOW WINDINGS TWO C-SHAPED CORES AND FIXING THEM

2. Claims: 2-43

SHIELDING OF CORE COVERING IT WITH A CONDUCTIVE LAYER