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EUROPEAN PATENT APPLICATION

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H 01 L 23/42**

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⑦① Applicant: **International Business Machines Corporation,**
Armonk, N.Y. 10504 (US)

⑦② Inventor: **Simons, Robert Edward,**
16 Shamrock Circle,
Poughkeepsie, New York 12603 (US)

⑦④ Representative: **Lewis, Alan J.,**
IBM United Kingdom Patent Operations Hursley Park,
Winchester, Hants, SO21 2JN (GB)

⑤④ **Apparatus for cooling heat generating electrical components.**

⑤⑦ The apparatus comprises integrated circuit chips (10) which are to be cooled.

Heat is conducted from the chips (10) to a cold plate (36) by a heat transfer path including spring biased heat conducting members (26) and housing (16).

A thermal adapter (42) is sandwiched between the housing (16) and the cold plate (36) and introduces predetermined heat transfer characteristics between the housing and the plate.

The adapter can be a good or poor conductor. The adapter can comprise cut-out regions aligned with low powered chips to increase the thermal resistance to heat flow from those chips while the remaining regions, aligned with high powered chips, have a lower thermal resistance. This permits both the low and high powered chips to attain their optimum operating temperature.

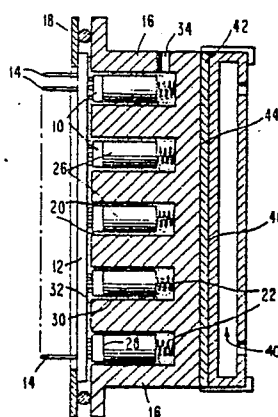


FIG. 1

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CLAIMS

1. Electrical apparatus comprising a heat generating electrical component or components, a heat sink and a heat transfer path for transferring heat from the or each component to the heat sink, characterised in that a thermal adapter 42 is positioned in the heat transfer path to introduce predetermined thermal transmission characteristics into the heat transfer path.
2. Electrical apparatus as claimed in claim 1, further characterised in that the adapter comprises a sheet or pad of material having a uniform heat transmission coefficient per unit area.
3. Electrical apparatus as claimed in claim 1, further characterised in that the adapter comprises a sheet or pad of material having a first pattern of areas having a first heat transmission coefficient per unit area and a second pattern of areas having a second and different heat transmission coefficient per unit area.
4. Electrical apparatus as claimed in claim 3, further characterised in that the first pattern of areas is provided by a pattern of apertures cut through the adapter.

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5. Electrical apparatus as claimed in claim 3 or 4, further characterised in that the apparatus comprises a multiplicity of low-power electronic components arranged in a pattern coinciding with one of the patterns of areas of the adapter and a multiplicity of higher-powered electronic components arranged in a second pattern coinciding with the other pattern of areas of the adapter.

6. Electrical apparatus as claimed in any one of claims 1 to 5, further characterised in that the adapter is made of polycarbonate, polytetrafluorithylene or mica.

7. Electrical apparatus as claimed in any one of claims 1 to 5, further characterised in that the adapter is made of stainless steel or aluminium.

FIG. 1

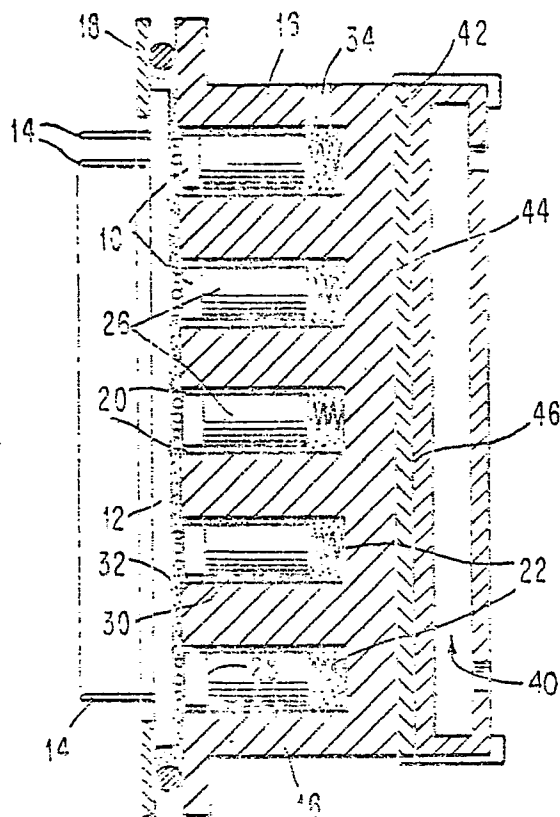


FIG. 2

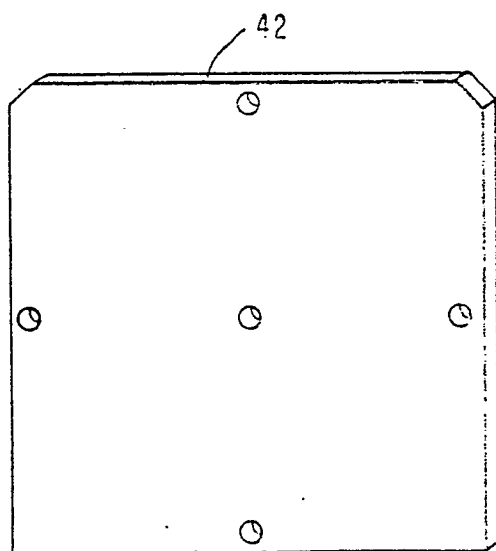


FIG. 3

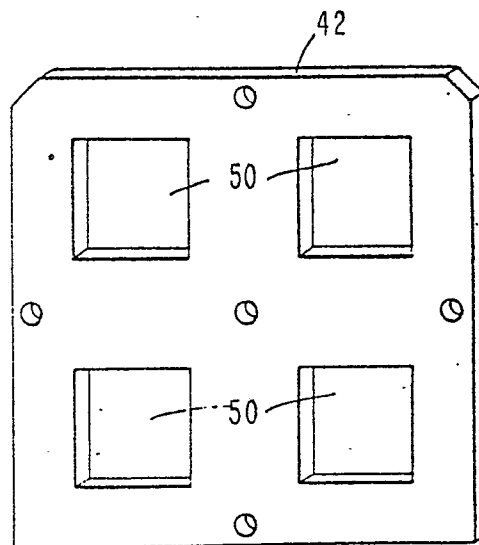


FIG. 4

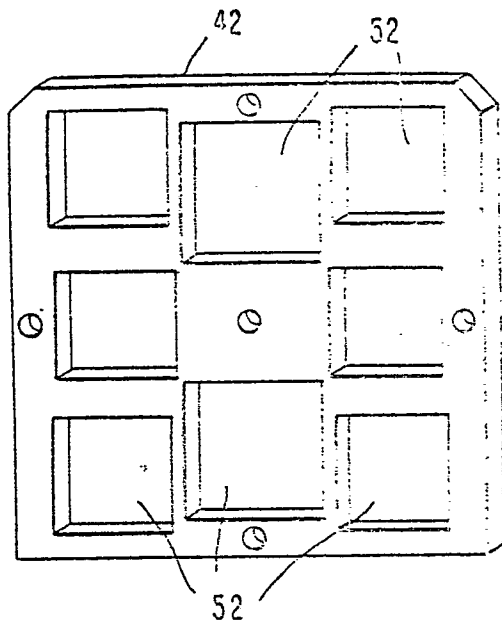


FIG. 5

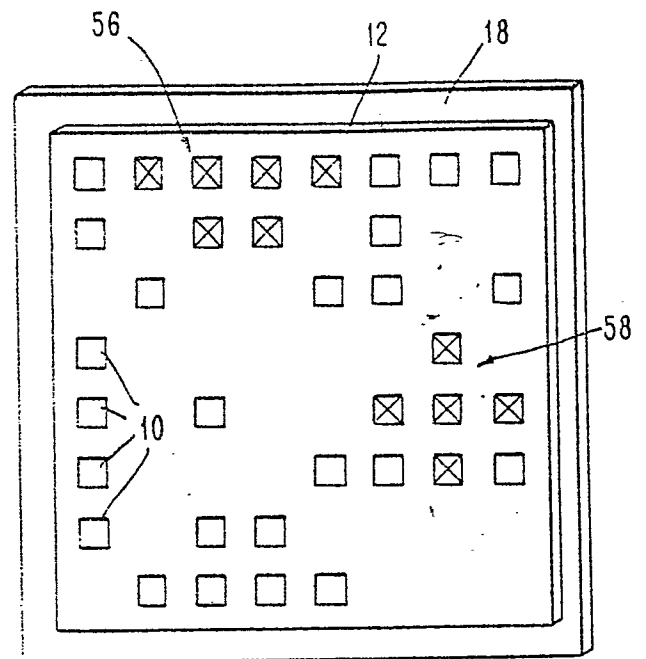


FIG. 6

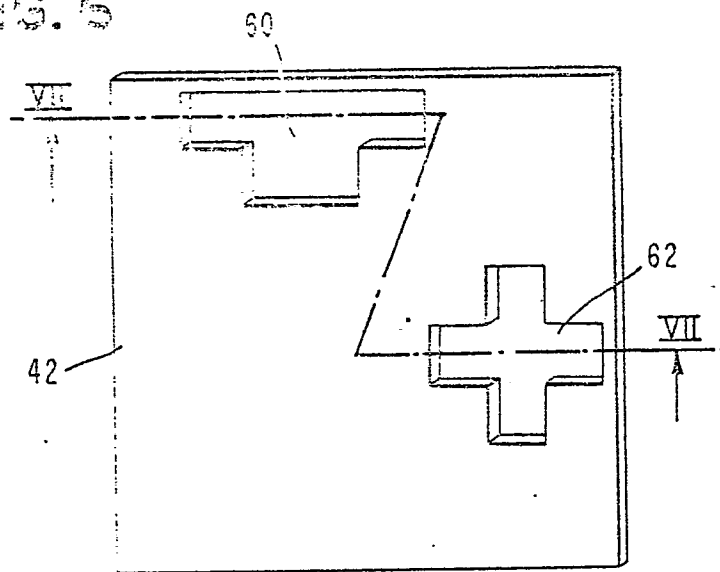


FIG. 7

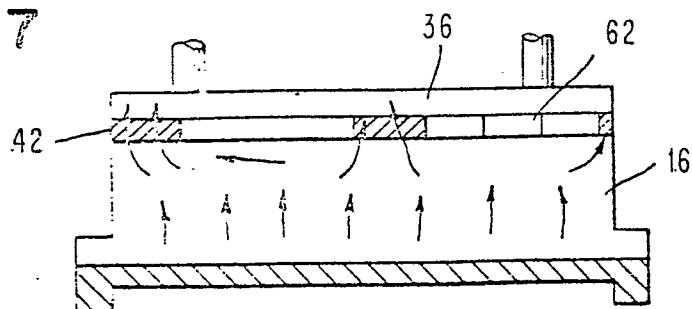


FIG. 8

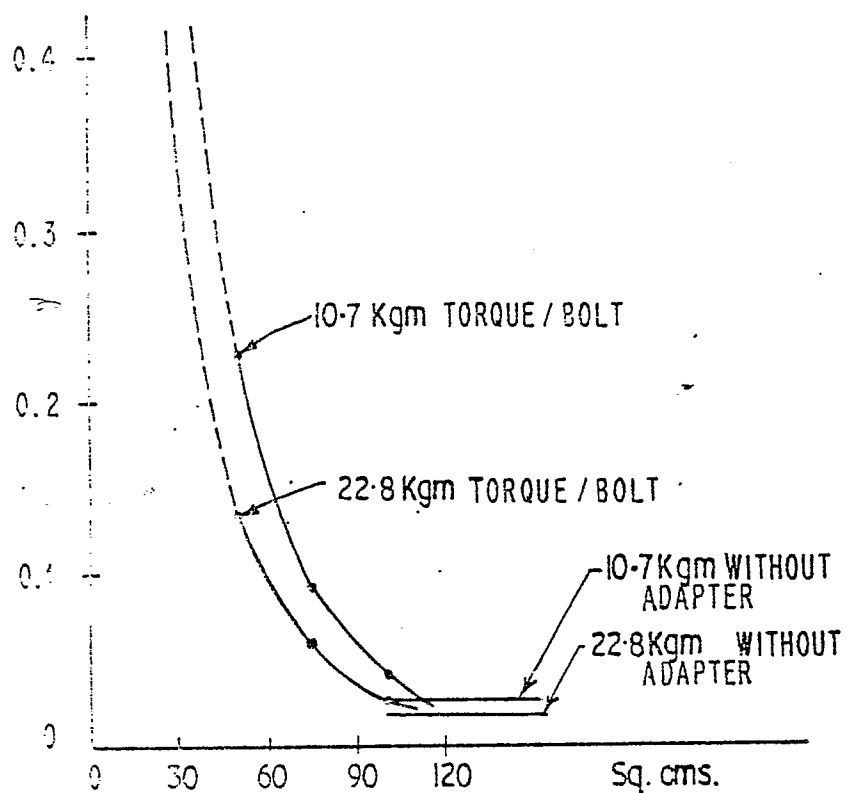
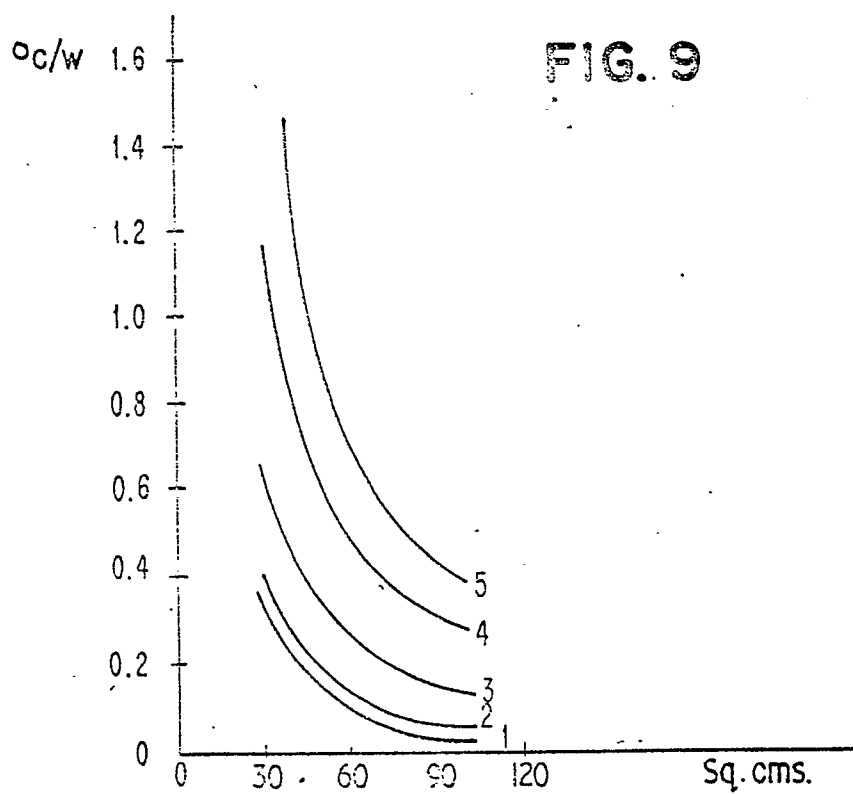


FIG. 9





DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	IBM TECHNICAL DISCLOSURE BULLETIN, vol. 18, october 1975, New York S.P.ANTIPPAS "Cooling cap for powder or liquid filled modules", pages 1387-1388	1	H 01 L 23/36 H 01 L 23/46 H 01 L 23/42
A	IBM TECHNICAL DISCLOSURE BULLETIN, vol. 19, january 1977, New York, A.H.BAUMAN et al."Multimodule heat sink", pages 2976-2977	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.)
			H 01 L 23/36 H 01 L 23/46 H 01 L 23/42
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reason
			&: member of the same family, corresponding documents
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	

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