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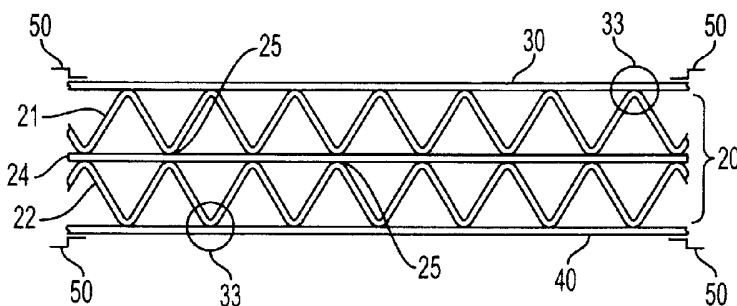
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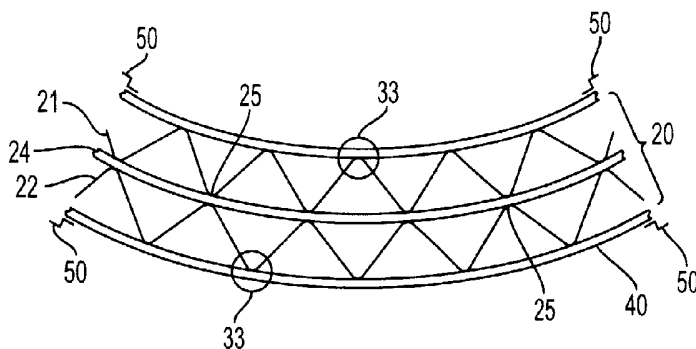
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[Continued on next page]

(54) Title: REVERSIBLE SHAPE MEMORY MULTIFUNCTIONAL STRUCTURAL DESIGNS AND METHOD OF USING AND MAKING THE SAME



A



C

(57) Abstract: A multifunctional member with a first active member (30), which is adapted to contract if exposed to a temperature above a first transition temperature range. A second active member (40), which is adapted to contract if exposed to a temperature above a second transition temperature range. A core member (20), which is adaptive for deformation. The first and second active members (30, 40) are attached on opposite or different sides of the core member (20). A heat source operatively connected to the first and second active members (30, 40) to expose them to transition temperatures. The first active member (30) contracts while above the first transition temperature range causing the second active member (40) to expand, wherein the second active member (40) is below the second transition temperature range. The second active member (40) contracts while above the second transition temperature range causing the first active member (30) to expand, wherein the first active member (30) is below the first transition temperature range.



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ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/27116

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C23C 30/00

US CL : 428/616

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 428/58, 59, 101, 594, 616, 655, 660, 668, 680, 913

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST data base word search: shape, memory, two-way, martensite, austenite, nickel, titanium, sandwich, sheet, layer, film, alternate, heat

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,518,444 A (ALBRECHT et al) 21 May 1985 (21.05.1985), column 2, lines 41-66.	1-34
A	US 5,700,337 A (JACOBS et al) 23 December 1997 (23.12.1997), column 3, lines 40-53.	1-34
A	US 5,804,276 A (JACOBS et al) 08 September 1998 (08.09.1998), column 3, lines 50-63.	1-34
A	US 6,182,929 B1 (MARTIN et al) 06 February 2001 (06.02.2001), column 5, lines 13-68 and column 6, lines 1-4.	1-34

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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