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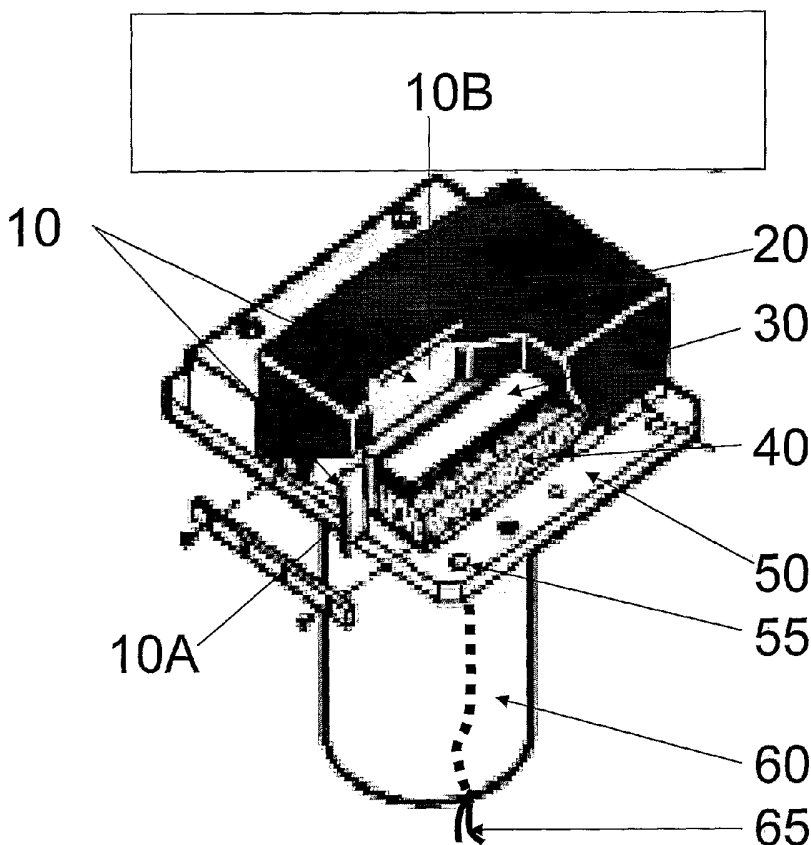
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[Continued on next page]

(54) Title: TITANIUM FOIL METALLIZATION PRODUCT AND PROCESS



(57) Abstract: According to some preferred embodiments, a physical vacuum deposition process for titanium foil can include: sputter etching one side of the titanium foil for about, e.g., 5 to 20 minutes; sputter depositing Titanium or a Titanium-Tungsten alloy; sputter depositing a low stress nickel; sputter depositing gold; reversing the foil and repeating these steps.

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ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/027810

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C23C14/16 C23C14/02 C23C28/02 G10K11/00

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)

IPC 7 C23C G10K

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 practical, search terms used)

EPO-Internal, WPI Data, INSPEC, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DATABASE WPI Section Ch, Week 197405 Derwent Publications Ltd., London, GB; Class M11, AN 1974-08863V XP002322023 & SU 382 774 A (PHYS CHEM A S USSR) 31 July 1973 (1973-07-31) abstract	1,2,5
A	----- EP 0 363 673 A (NIPPONDENSO CO., LTD) 18 April 1990 (1990-04-18) column 1, line 14 - column 2, line 30; claims; figures	1,2,5
A	----- GB 1 372 167 A (COMPAGNIE INDUSTRIELLE DES TELECOMMUNICATIONS CIT-ALCATEL) 30 October 1974 (1974-10-30) page 1, line 28 - page 2, line 45; claims ----- -/--	1,2,5

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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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.

"&" document member of the same patent family

Date of the actual completion of the international search

26 July 2005

Date of mailing of the international search report

29.09.05

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/027810

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 137 370 A (FUJISHIRO ET AL) 30 January 1979 (1979-01-30) claims	1,2,5
A	----- US 4 216 271 A (INOUE, HIDEAKI ET AL) 5 August 1980 (1980-08-05) column 1, line 13 - line 35; claims; example 1	1-6
X	----- BARSON S D ET AL: "Investigation of ion assisted palladium treatments for improved corrosion resistance of titanium foil in the electron beam dry scrubber process" SURF COAT TECHNOL; SURFACE AND COATINGS TECHNOLOGY 2000 ELSEVIER SEQUOIA SA, LAUSANNE, SWITZERLAND, vol. 127, no. 2, 2000, pages 179-192, XP002337872	3
Y	"2.1 Specimen Preparation"	6
X	----- US 3 835 007 A (FERAT A, FR ET AL) 10 September 1974 (1974-09-10)	3
Y	column 1, line 70 - column 3, line 9; claims; examples 1-7	6
A	----- KOSKI K ET AL: "The connection between sputter cleaning and adhesion of thin solid films" SURFACE AND COATINGS TECHNOLOGY ELSEVIER SWITZERLAND, vol. 80, no. 1-2, March 1996 (1996-03), pages 195-199, XP002337873 ISSN: 0257-8972 the whole document	3,6
X	----- EP 0 402 568 A (NKK CORPORATION) 19 December 1990 (1990-12-19)	4
Y	claims; examples	6
A	----- US 6 586 114 B1 (ANTON BRYCE RANDOLPH) 1 July 2003 (2003-07-01) column 2, line 9 - line 33; claims	4
X	----- EP 0 460 246 A (THE B.F. GOODRICH COMPANY) 11 December 1991 (1991-12-11)	7,8, 10-13, 15,16
A	column 6, line 8 - line 18; claims column 9, line 11 - line 28	1-6,9,14
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A	page 3, line 11 - line 35; claims	1-6,9,14

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/027810

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1,2,5

Methods for depositing nickel and gold onto titanium foils.

2. claims: 3, 6

Method for reducing impurity levels on titanium foils.

3. claim: 4

Physical vapour deposition process for titanium foils using an initial titanium or titanium-tungsten layer.

4. claims: 7-16

Method and assembly for using a metal foil to protect underwater transducers.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/027810

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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