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60/580,619 17 June 2004 (17.06.2004) US
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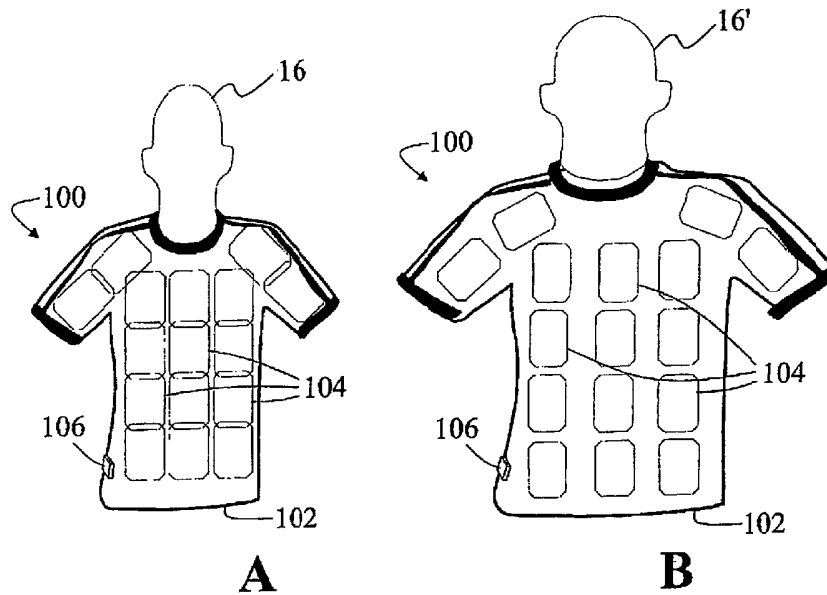
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**Declaration under Rule 4.17:**

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS,

[Continued on next page]

(54) Title: FLEXIBLE AND WEARABLE RADIO FREQUENCY COIL GARMENTS FOR MAGNETIC RESONANCE IMAGING



(57) Abstract: A radio frequency apparatus for at least one of (i) receiving and (ii) exciting a magnetic resonance signal includes an item of clothing (102, 202). The item of clothing includes one or more layers (110, 112, 120, 122, 300, 402) that are stretchable to comport with differently sized and shaped imaging subjects. A plurality of radio frequency coils (104, 114, 204, 206, 208, 302, 404) are attached to one or more layers of the item of clothing. The coils are relatively movable with respect to one another responsive to stretching of the stretchable item of clothing. The one or more layers of the item of clothing include an anti-microbial agent (92, 92', 94') disposed on or incorporated into at least one layer.

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IB2005/051806

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 G01R33/3415

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 G01R

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, PAJ, WPI Data, IBM-TDB, COMPENDEX, INSPEC, BIOSIS, MEDLINE, EMBASE

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 084 411 A (GIAQUINTO ET AL) 4 July 2000 (2000-07-04) column 2, lines 13-57 column 4, line 26 - column 5, line 38 figure 2	1-5,7,9, 13-15,17
X	US 2002/151788 A1 (MENON ASHOK) 17 October 2002 (2002-10-17) paragraph [0006] - paragraph [0015] paragraph [0021] - paragraph [0035] figures 1-4	1-5,7,9, 13,15,17
X	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 04, 30 April 1999 (1999-04-30) -& JP 11 019063 A (SHIMADZU CORP), 26 January 1999 (1999-01-26) abstract; figures 5,7	1-5,7, 13,15,17
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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

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"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

25 July 2005

Date of mailing of the international search report

23. 09. 2005

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IB2005/051806

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 396 905 A (NEWMAN ET AL) 14 March 1995 (1995-03-14) column 1, lines 48-68 column 2, line 12 - column 3, line 27 figures 1-3	1-5,7, 13,17
X	----- US 5 435 302 A (LENKINSKI ET AL) 25 July 1995 (1995-07-25) column 1, lines 14-18 column 5, lines 29-45 column 8, line 45 - column 9, line 28 figures 3,4	1,3-5,7, 13,17
X	----- PATENT ABSTRACTS OF JAPAN vol. 1997, no. 07, 31 July 1997 (1997-07-31) -& JP 09 075323 A (TOSHIBA CORP), 25 March 1997 (1997-03-25) abstract; figures 2,12	1-5,7, 13,15,17
X	----- PATENT ABSTRACTS OF JAPAN vol. 014, no. 176 (C-0707), 9 April 1990 (1990-04-09) & JP 02 026536 A (HITACHI MEDICAL CORP), 29 January 1990 (1990-01-29) abstract	1,2,4,5, 7-9, 13-15,17
A	----- US 5 400 787 A (MARANDOS ET AL) 28 March 1995 (1995-03-28) column 1, line 66 - column 2, line 5 column 2, line 31 - column 3, line 65 figures 2-4 -----	16

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IB2005/051806

## 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.:

see 'Invitation to pay additional fees'

### 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: 1-9, 13-17

An rf apparatus according to the following sub-inventions.

1.1. claims: 1-5, 7, 9, 13-15, 17

An rf apparatus comprising an item of clothing comprising one or more layers and a plurality of rf coils attached to the one or more layers of the item of clothing.

1.2. claim: 6

An rf apparatus comprising a plurality of first rf coils and a plurality of second rf coils, wherein the plurality of first rf coils is attached to a first stretchable layer of the item of clothing and the plurality of second rf coils is attached to a second stretchable layer of the item of clothing different from the first stretchable layer.

1.3. claim: 8

An rf apparatus wherein the plurality of rf coils includes a plurality of flexible conductive wires woven into the one or more stretchable layers of the item of clothing, the flexible conductive wires defining a plurality of rf antennas.

1.4. claim: 16

An rf apparatus wherein the layers of the item of clothing include an inflatable layer, the plurality of rf coils being disposed in or on the inflatable layer and conforming to a pre-selected geometry responsive to inflation of the inflatable layer.

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2. claims: 10-12, 18-23

An rf apparatus comprising an anti-microbial agent.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No PCT/IB2005/051806
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