

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
18 November 2004 (18.11.2004)

PCT

(10) International Publication Number
WO 2004/098407 A1

(51) International Patent Classification⁷: **A61B 5/055**,
G01R 33/56, G01N 24/08, G01V 3/00

(21) International Application Number:
PCT/AU2004/000471

(22) International Filing Date: 8 April 2004 (08.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2003901659 9 April 2003 (09.04.2003) AU

(71) Applicant (for all designated States except US): **INNER
VISION BIOMETRICS PTY LTD** [AU/AU]; 117 Stir-
ling Highway, Nedlands, Western Australia 6009 (AU).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ST PIERRE, Tim**
[AU/AU]; School of Physics, M013, The University of
Western Australia, Crawley, Western Australia 6009
(AU). **CLARK, Paul** [AU/AU]; 13A Adamson Road,
Brentwood, Western Australia 6153 (AU).

(74) Agent: **GRIFFITH HACK**; 6th Floor, 256 Adelaide Ter-
race, Perth, Western Australia 6000 (AU).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): 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, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

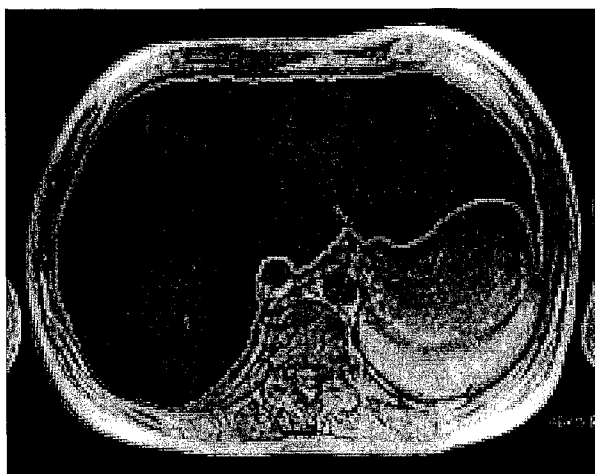
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,
GB, GR, HU, IE, IT, LU, MC, 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).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF ESTIMATING THE SPATIAL VARIATION OF MAGNETIC RESONANCE IMAGING RADIOFRE-
QUENCY (RF) SIGNAL INTENSITIES WITHIN AN OBJECT FROM THE MEASURED INTENSITIES IN A UNIFORM SPIN
DENSITY MEDIUM SURROUNDING THE OBJECT



(57) Abstract: A method of estimating the spatial variation in RF signal intensity within magnetic resonance images of an object is described. The estimate can be used to provide enhanced contrast in a magnetic resonance image by correcting for spatial variation in RF intensities arising from non-uniformities in RF receiving coils of an MRI machine acquiring the image as well as distortions arising from the object and observation itself. This is achieved through compound imaging of a medium of essentially uniform spin density surrounding the object. From analysis of the surrounding medium, and the location of notional points of RF signal reception, a semi-empirical mathematical formulation of the decay profile of the RF signal intensity within the object is determined. This is then fitted to selected signal intensities from the medium surrounding the object to obtain an estimate of the spatial variation in RF signal intensity within the object.

WO 2004/098407 A1