



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 439 608 A8**

(12) **CORRECTED EUROPEAN PATENT APPLICATION**

published in accordance with Art. 158(3) EPC

Note: Bibliography reflects the latest situation

(15) Correction information:
Corrected version no 1 (W1 A1)
INID code(s) 54

(51) Int Cl.7: **H01Q 7/06**, H01Q 1/38,
B42D 15/10, G06K 19/00,
G08B 13/24

(48) Corrigendum issued on:
20.10.2004 Bulletin 2004/43

(86) International application number:
PCT/JP2002/009955

(43) Date of publication:
21.07.2004 Bulletin 2004/30

(87) International publication number:
WO 2003/030300 (10.04.2003 Gazette 2003/15)

(21) Application number: **02800249.1**

(22) Date of filing: **26.09.2002**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **28.09.2001 JP 2001303050**
03.12.2001 JP 2001368241

(71) Applicant: **MITSUBISHI MATERIALS**
CORPORATION
Chiyoda-ku, Tokyo 100-8117 (JP)

(72) Inventors:
• **ENDO, Takanori,**
Mitsubishi Materials Corporation
Bunkyo-ku, Tokyo 112-0002 (JP)

• **YAHATA, Seiro,**
Mitsubishi Materials Corporation
Bunkyo-ku, Tokyo 112-0002 (JP)
• **TSUCHIDA, Takashi, Mitsubishi Materials Corp.**
Bunkyo-ku, Tokyo 112-0002 (JP)
• **YONEZAWA, Tadashi,**
Mitsubishi Materials Corp.
Bunkyo-ku, Tokyo 112-0002 (JP)

(74) Representative: **HOFFMANN - EITLE**
Patent- und Rechtsanwälte
Arabellastrasse 4
81925 München (DE)

(54) **ANTENNA COIL AND RFID-USE TAG USING IT, TRANSPONDER-USE ANTENNA**

(57) An antenna coil 10 comprises an air-core coil 12 which is wound helically in a plane and a plate magnetic core member 13 which is inserted in the air-core coil 12 so as to be approximately parallel with a plane of the air-core coil 12. The magnetic core member 13 is formed by a soft magnetic metal, an amorphous or ferrite, or a composite member of a powder, flake and plastic, or rubber. The magnetic core member 13 is formed by performing an injection molding operation or a compressing molding operation of the composite member. Alternatively, the magnetic core member 13 is a magnetic coating which is formed by applying and drying the composite member. A non-magnetic conductive plate 14 which has a conductivity is layered on a surface of the air-core coil 12 through which the magnetic core member 13 is inserted. The conductive plate 14 is made of a copper, a copper alloy, an aluminum or an aluminum alloy having 0.01 to 2 mm thickness. By doing this, it is

operated by relatively high frequency while it is rigid relatively.

FIG. 1

