

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 September 2007 (07.09.2007)

PCT

(10) International Publication Number
WO 2007/100257 A1

(51) International Patent Classification:
G07F 1/06 (2006.01)

(21) International Application Number:
PCT/NO2007/000080

(22) International Filing Date:
28 February 2007 (28.02.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
20060983 28 February 2006 (28.02.2006) NO

(71) Applicant (for all designated States except US): **TOMRA SYSTEMS ASA** [NO/NO]; Brendsrudhagen 2, N-1385 Asker (NO).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **REKDAL, Even** [NO/NO]; Kingosgate 19, N-0457 Oslo (NO).

(74) Agent: **LANGFELDT, Jens, F., C.**; Zacco Norway AS, P.O. Box 1002, Vika, N-0125 Oslo (NO).

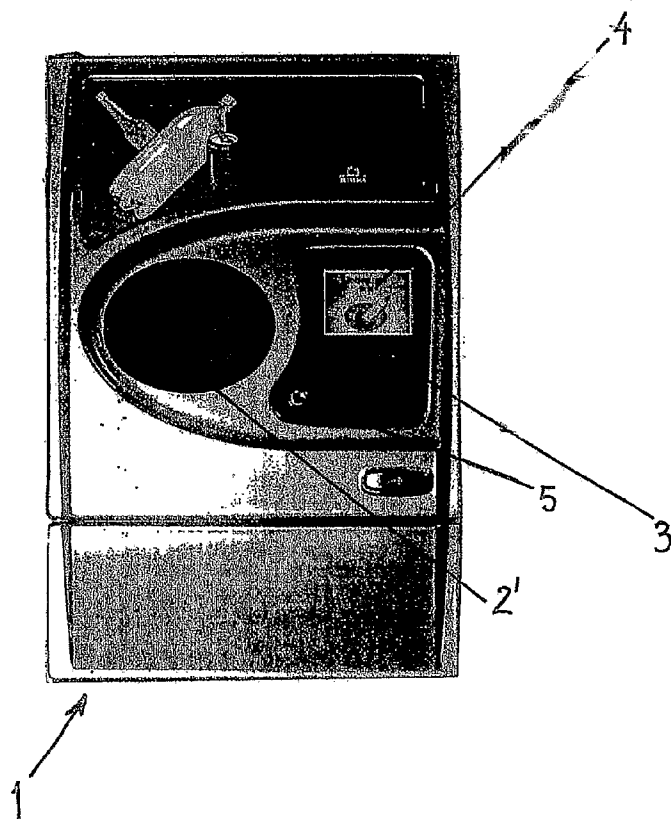
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, 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, IS, IT, LT, LU, LV, 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

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR OVERRIDING A REVERSE VENDING MACHINE



(57) Abstract: A method and apparatus for causing override of a reverse vending machine, where before or during execution of the selected normal usage applications, such as receiving articles in the form of empty beverage containers, the reverse vending machine utilizes an optically acting detection device to detect machine readable optical codes and/or article characteristics, and where the overriding is related to in situ-based application programming, diagnosis, maintenance, troubleshooting, error recovery or usage statistics. A code carrier (12; 13; 14; 15) is used, which shows at least one optically machine readable dedicated override code (12'; 13'; 14'; 15'). The code carrier is inserted into the reverse vending machine to reach the detection device (9, 10; 11) for detection of the override code, and the detected override code causes a processor (17) in or connected to the reverse vending machine to execute a desired override operation.

WO 2007/100257 A1



-
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

Method and apparatus for overriding a reverse vending machine

The present invention relates to a method and apparatus for causing override of a reverse vending machine, where before or during execution of the selected normal usage applications, such as receiving articles in the form of empty beverage
5 containers, the reverse vending machine utilizes an optically acting detection device to detect machine readable optical codes and/or article characteristics, and where the overriding is related to *in situ*-based application programming, diagnosis, maintenance, troubleshooting, error recovery or usage statistics.

10

There are previously known reverse vending machines, for example, "TOMRA 710" from Tomra Systems ASA, where the overriding is done by punching the necessary override code on a key pad. The method requires assistance from a user manual where the various codes are given, and requires in addition that the correct code be
15 inputted via the key pad. In a stressful situation where the customer may be waiting for an operative problem with the reverse vending machine to be solved quickly by the shop or supermarket personnel, it is often easy to punch in the wrong code. In certain instances it may happen that the personnel remember the codes that are most frequently used, and that they base their service on such methodology instead of
20 bringing forth the user manuals.

Many of the less expensive models of reverse vending machines utilize such key pads, and in addition have very simple display panels. In some cases it is possible to connect a lap-top computer to the reverse vending machine in order to carry out more
25 advanced overriding, especially for troubleshooting, but in general this becomes too complicated for the shop personnel to do.

More expensive models of reverse vending machines, such as, for example, "TOMRA 820" from Tomra Systems ASA, have a more advanced display system, which also
30 incorporates an advanced yet user-friendly maintenance and problem-solving procedure with guidance provided for the personnel via a large display panel. The same screen is also used for the display of detailed user instruction information to the customer.

35 For the large number of reverse vending machines already in use, as well as the simpler models that are still being marketed, there has been a long-felt need to be able to simplify the input of the override code in a more rapid and secure manner, in addition

to being able to quickly obtain override codes from the supplier of the reverse vending machine as needed. This latter function may be relevant in those cases where, for example, advanced troubleshooting is required to determine if it is necessary to have more comprehensive maintenance or repair, perhaps of such a nature that would call
5 for assistance from the supplier's service personnel. But even for an advanced reverse vending machine like "TOMRA 820," it may be an advantage in a number of situations to be able to initiate an override function quickly, without having to resort to use of the display panel of the touch-type.

- 10 For this objective, the invention provides a method as introduced above, which is characterized by
- obtaining a code carrier that shows at least one optically machine-readable, dedicated override code,
 - inserting the code carrier into the reverse vending machine to reach the detection
15 device for detection of the override code, and
 - allowing the detected override code to cause a processor in or connected to the reverse vending machine to execute a desired override operation.

Recognizing that the reverse vending machine has as a detection device either a
20 barcode reader or a camera, or both, and that the camera is also designed with capability to detect a barcode, the use of the reverse vending machine's own such device(s) would be applicable for reading of the override code on the code carrier.

Additional features of the method will be apparent from the attached subclaims 2 – 6.

25 The apparatus introduced above is characterized, according to the invention, by a code carrier having at least one optically machine-readable, dedicated override code which, on insertion of the code carrier into the reverse vending machine, is detectable by the reverse vending machine's detection device, said apparatus being coupled to a
30 processor operative with the reverse vending machine which causes the desired override operation.

Additional features of the apparatus are apparent from the attached subclaims 8 – 12.

35 The invention shall now be described in more detail with reference to the attached figures.

Fig. 1 and 2 show a known reverse vending machine equipped with an override key pad.

Fig. 3 is a schematic representation of the principle behind the present invention.

5 Fig. 4 shows a simplified block diagram of a known *per se* reverse vending machine.

Fig. 5 – 8 show alternative embodiments of a code carrier for use in carrying out the invention.

10 Fig. 1 and 2 show a known reverse vending machine 1 which in front panel 2 has a feed opening 2' for empty beverage containers. The reverse vending machine has a printer 3 that is normally intended for issuing a receipt for the return goods that are delivered, a display panel 4, and an actuating button 5 which the user can push for issuing of a receipt. Further, the reverse vending machine is provided with a conveyor
15 belt device 6, a key pad 7 for input of an override code and a sound emitter 8.

As indicated in Fig. 3, such a reverse vending machine will be provided with a detection device, which may consist of a camera 9 capable of viewing, optionally via a mirror 10, an article such as, for example, an empty beverage container (not shown) and/or a bar
20 code reader 11.

Fig. 4 indicates that the reverse vending machine has a central processor 17 to which are attached, *inter alia*, the printer 3 and the display panel 4, together with at least one said camera 9 and said barcode detector 11. Such a camera 9 will be able not only to
25 detect an article's contour, but also to detect other characteristics of an article such as, for example, a barcode. An additional printer and/or display panel 16 may be remotely located relative to the reverse vending machine, permitting a complete status report to be viewed at a different location. The blocks 18₁ 18_n represent other functional devices in the reverse vending machine, such as, for example, position sensors,
30 security detectors, motors, light emitters, etc.

To facilitate initiation of the override function of the reverse vending machine, it is proposed according to the invention to provide a code carrier 12; 13; 14; 15 which displays at least one optically machine readable, dedicated override code 12'; 13'; 14';
35 15', non-restrictive examples of which are shown in Fig. 5 – 8.

The code carrier 12; 13; 14; 15 is inserted by hand 19 into the reverse vending machine, so that the override code 12'; 13'; 14'; 15' located on the code carrier may be read by the detection device, i.e., the camera 9 and/or the barcode reader 11, depending on which type of detection device the reverse vending machine 1 is
5 equipped with.

The detected override code 12'; 13'; 14'; 15', when transmitted from the detection device to the processor 17, will cause the processor in or connected to the reverse vending machine to execute a desired override operation.

10

It is of course an advantage that when reading the override code 12'; 13'; 14'; 15', one is able in this way to use the reverse vending machine's own detection device(s).

As shown in Fig. 5 – 8, the code carrier 12; 13; 14; 15 is capable of displaying by
15 means of lettering, signs, or symbols information concerning the intended effect of the override code on the operation of the reverse vending machine. The display of the information may be permanent or temporary. The display will be permanent if the code carrier is an optically readable card 12, a print-out 12 from a printer or information 13" printed in a book 13, as shown on Fig. 5 and 6, while it will be temporary in those cases
20 where the code carrier constitutes, for example, a display panel on a mobile phone 14 or a display panel on a handheld computer 15, a so-called personal digital assistant (PDA). In all of these cases the override code 12'; 13'; 14'; 15' will be distinctly visible to the detection device.

25 Use of a mobile phone 14 may be beneficial in those instances where a specific override code is needed to make a diagnosis on the reverse vending machine 1 and such override code is not available to the owner of the reverse vending machine. In such a case, the owner may have a special code sent from the supplier of the reverse vending machine, which may be used on that occasion. The use of a personal digital
30 assistant (PDA) 15 enables easy updating of service guides and override codes for the reverse vending machine, and allows the owner to obtain both detailed instructions associated with the individual override functions and the required code in changing the display images. Of course, instead of using a PDA, it is also possible to envision the use of a similar, but simpler and less expensive unit that is provided by the supplier of
35 the reverse vending machine.

After completion of the override operation, the processor 17 would be able to cause issuing of an operational report either locally on the printer 3 or display panel 4 of the reverse vending machine and/or to a remote control unit 16, for example a printer or screen.

P a t e n t c l a i m s

1.

A method for causing override of a reverse vending machine, where before or during
5 execution of the selected normal usage applications, such as receiving articles in the
form of empty beverage containers, the reverse vending machine utilizes an optically
acting detection device to detect machine readable optical codes and/or article
characteristics, and where the overriding is related to *in situ*-based application
programming, diagnosis, maintenance, troubleshooting, error recovery or usage
10 statistics,
c h a r a c t e r i z e d b y
- obtaining a code carrier that shows at least one optically machine-readable, dedicated
override code,
- inserting the code carrier into the reverse vending machine to reach the detection
15 device for detection of the override code, and
- allowing the detected override code to cause a processor in or connected to the
reverse vending machine to execute a desired override operation.

2.

20 A method as disclosed in claim 1, c h a r a c t e r i z e d i n
that the code carrier is designed to display by means of lettering, signs, or symbols
information concerning the intended effect of the override code on the operation of the
reverse vending machine.

25 3.

A method as disclosed in claim 1 or 2, c h a r a c t e r i z e d i n
that the display on the code carrier, depending on the nature of the code carrier, is of
either permanent or temporary type.

30 4.

A method as disclosed in claim 1, 2 or 3, c h a r a c t e r i z e d
i n that the code carrier is selected from the group consisting of: an optically
readable card, a print-out from a printer, a book, a display panel on a mobile phone,
and a display panel of a handheld computer, so-called personal digital assistant (PDA).

35

5.

A method as disclosed in claim 1, 2 or 3, c h a r a c t e r i z e d
i n that after the override operation is completed, the processor causes the issuing
5 of an operational report either locally on the reverse vending machine and/or to a
remote control unit.

6.

A method as disclosed in claim 1, c h a r a c t e r i z e d i n
10 that as a detection device there is used at least one of a barcode reader and a camera.

7.

An apparatus for causing override of a reverse vending machine, where before or
during execution of the selected normal usage applications, such as receiving articles
15 in the form of empty beverage containers, the reverse vending machine utilizes an
optically acting detection device to detect machine readable optical codes and/or article
characteristics, and where the overriding is related to *in situ*-based application
programming, diagnosis, maintenance, troubleshooting, error recovery or usage
statistics, c h a r a c t e r i z e d b y a code carrier having at least
20 one optically machine-readable, dedicated override code which, on insertion of the
code carrier into the reverse vending machine, is detectable by the reverse vending
machine's detection device, said apparatus being coupled to a processor operative
with the reverse vending machine which causes the desired override operation.

25 8.

An apparatus as disclosed in claim 7, c h a r a c t e r i z e d i n
that the code carrier is in addition adapted to display information concerning the
operative and intended effect of the override code on the reverse vending machine.

30 9.

An apparatus as disclosed in claim 7 or 8, c h a r a c t e r i z e d
i n that the code carrier, as a function of its nature, is adapted to provide said
display permanently or temporarily.

35 10.

An apparatus as disclosed in claim 7, 8 or 9, c h a r a c t e r i z e d
i n that the code carrier is selected from the group: an optically readable card, a

print-out from a printer, a book, a display panel on a mobile phone, and a display panel of a handheld computer, so-called personal digital assistant (PDA).

11.

- 5 An apparatus as disclosed in claim 7, c h a r a c t e r i z e d i n
that the processor is coupled to a display or printer in order to cause the issuing of a
readable operational report after completion of the override operation.

12.

- 10 An apparatus as disclosed in claim 7, c h a r a c t e r i z e d i n
that the detection device constitutes at least one of a barcode reader and a camera.

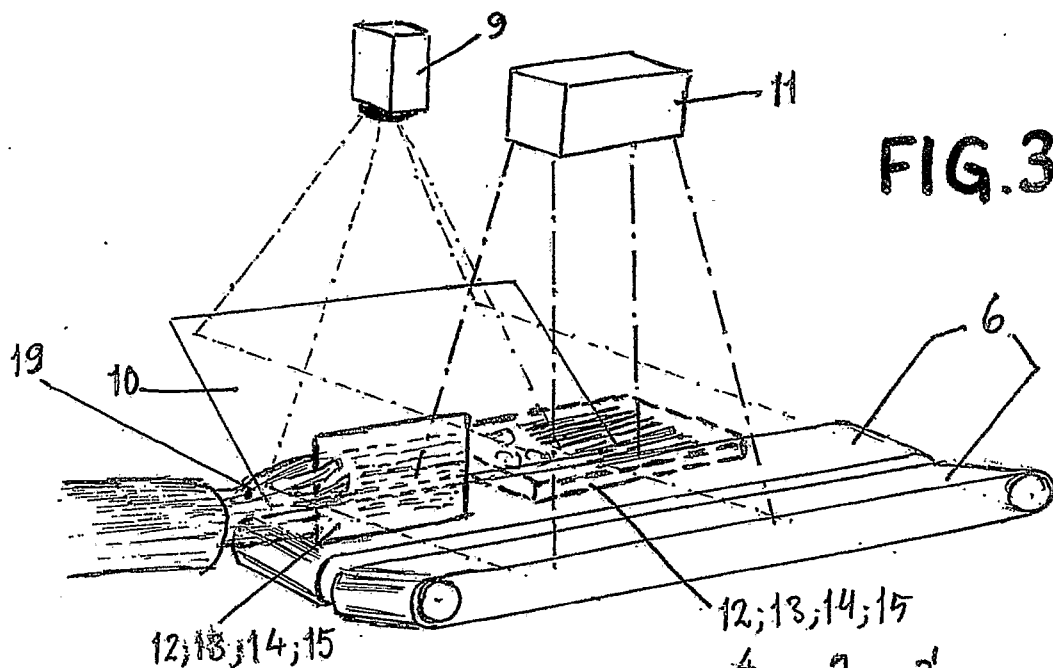


FIG. 3

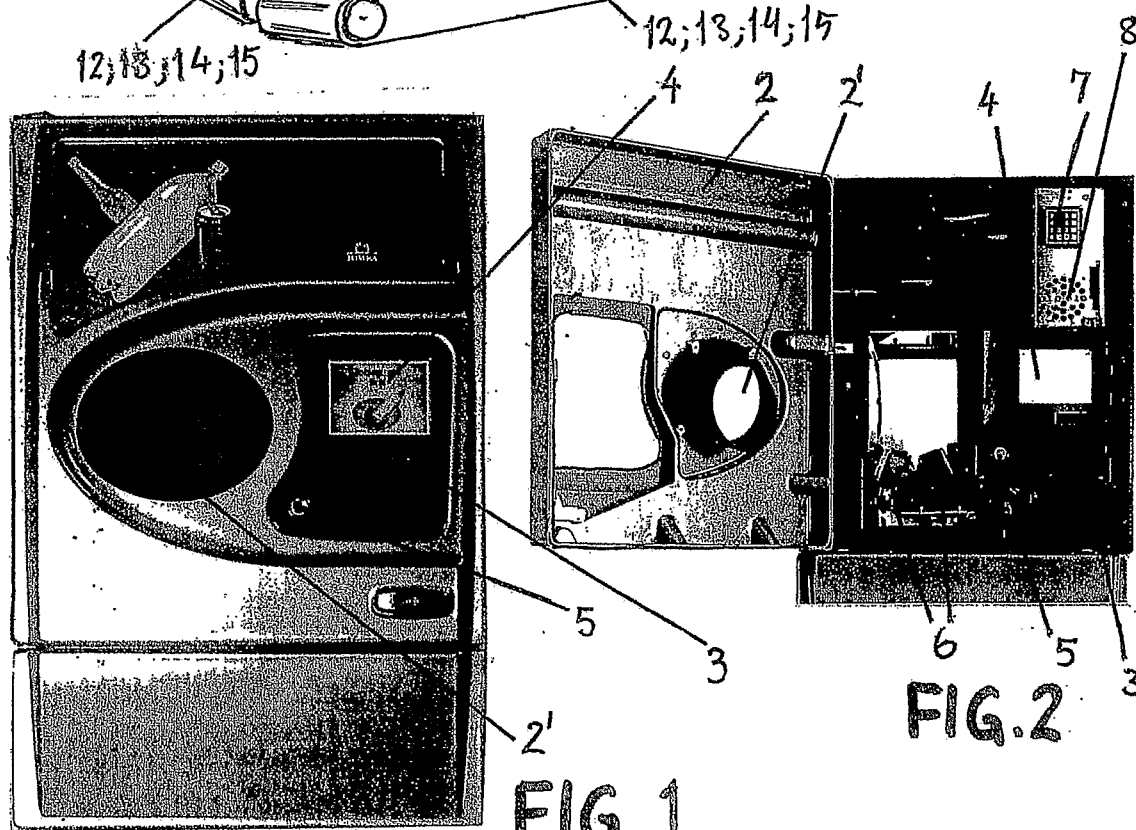


FIG. 1

FIG. 2

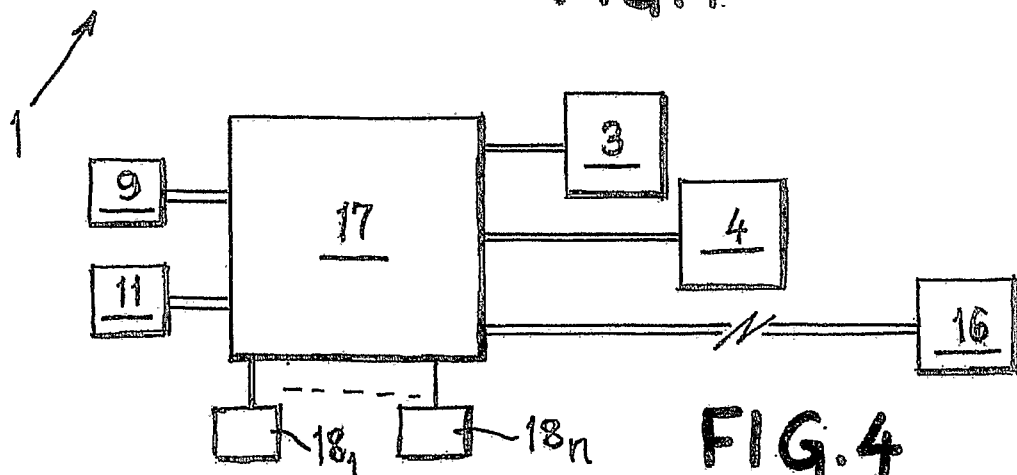


FIG. 4

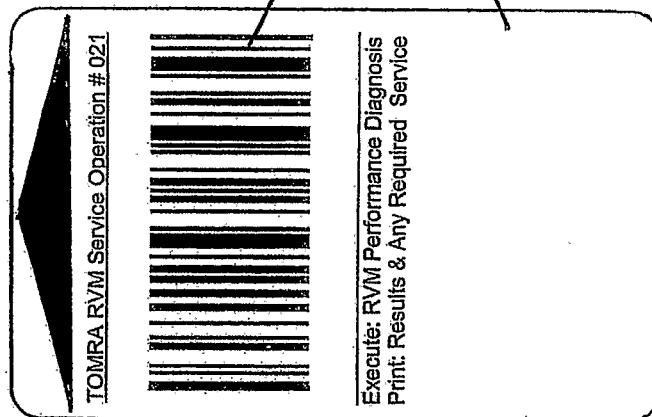


FIG. 5

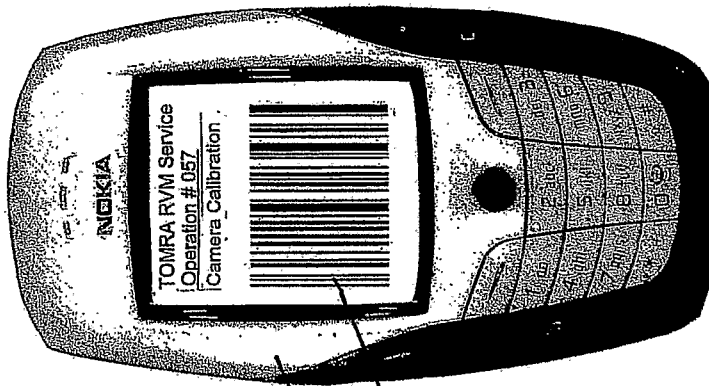


FIG. 7



FIG. 8

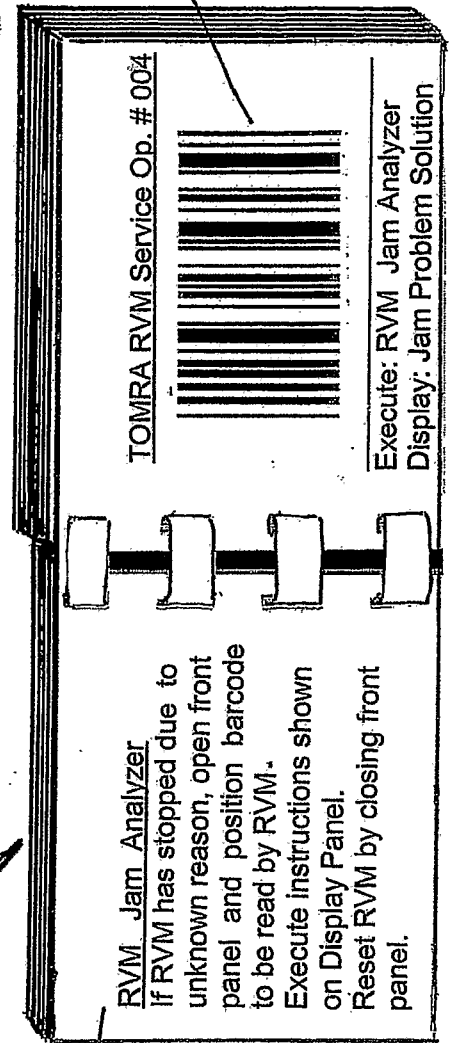


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/NO2007/000080

A. CLASSIFICATION OF SUBJECT MATTER
INV. G07F1/06

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)
G07F

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 784 251 A (DEWOOLFSON BRUCE H [US] ET AL) 15 November 1988 (1988-11-15) abstract column 7, line 53 - line 64; claim 1; figures 1,2,10-12	1-12
Y	EP 1 515 287 A (NTT DOCOMO INC [JP]) 16 March 2005 (2005-03-16) abstract; claim 1; figures 1,5	1-12
A	WO 01/80047 A (BRITISH AIRWAYS PLC [GB]; BOYD LESLIE FERGUS [GB]) 25 October 2001 (2001-10-25) abstract; figure 6	4,10
	----- -/--	



Further documents are listed in the continuation of Box C.



See patent family 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

22 June 2007

Date of mailing of the international search report

04/07/2007

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Lavin Liermo, Jesus

INTERNATIONAL SEARCH REPORT

International application No

PCT/NO2007/000080

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 5 469 783 A (FRY GENE [US]) 28 November 1995 (1995-11-28) abstract; figures 10,11 column 7, line 13 - line 26 -----	1-12
A	DE 102 07 405 A1 (PROKENT AG [DE]) 18 September 2003 (2003-09-18) the whole document -----	1-12
A	US 4 656 510 A (MATTILA TIMO [FI]) 7 April 1987 (1987-04-07) abstract -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/N02007/000080

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4784251	A	15-11-1988	NONE	
EP 1515287	A	16-03-2005	CN 1604070 A JP 2005084916 A US 2005055235 A1	06-04-2005 31-03-2005 10-03-2005
WO 0180047	A	25-10-2001	AT 350724 T AU 4861701 A DK 1275070 T3 EP 1275070 A2 JP 2004501423 T US 2003164400 A1 US 2006081704 A1	15-01-2007 30-10-2001 14-05-2007 15-01-2003 15-01-2004 04-09-2003 20-04-2006
US 5469783	A	28-11-1995	NONE	
DE 10207405	A1	18-09-2003	NONE	
US 4656510	A	07-04-1987	CA 1234919 A1 DE 3574235 D1 EP 0174549 A1 FI 843414 A NO 853377 A	05-04-1988 21-12-1989 19-03-1986 01-03-1986 03-03-1986