(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
27 January 2011 (27.01.2011)

PCT

(10) International Publication Number
WO 2011/010230 A1

(51) International Patent Classification:
H04H 60/61 (2008.01)

(21) International Application Number:
PCT/IB2010/052609

(22) International Filing Date:
11 June 2010 (11.06.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2009/05642 21 July 2009 (21.07.2009) TR

(71) Applicant *(for all designated States except US)*: **TURKCELL ILETISIM HIZMETLERI ANONIM SIRKETI** [TR/TR]; Turkcell Plaza Mesrutiyet Caddesi., No:71, Tepebasi, 34430 Istanbul (TR).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **CALIKUS, Onur** [TR/TR]; Turkcell İletisim Hizmetleri Anonim Sirketi, Turkcell Plaza Mesrutiyet Caddesi, No:71, Tepebasi, 34430 Istanbul (TR). **KURT, Gunes** [TR/TR]; Turkcell İletisim Hizmetleri Anonim Sirketi, Turkcell Plaza Mesrutiyet Caddesi, No:71, Tepebasi, 34430 Istanbul (TR). **SAHIN, Coskun** [TR/TR]; Turkcell İletisim Hizmetleri Anonim Sirketi, Turkcell Plaza Mesrutiyet Caddesi, No:71, Tepebasi, 34430 Istanbul (TR).

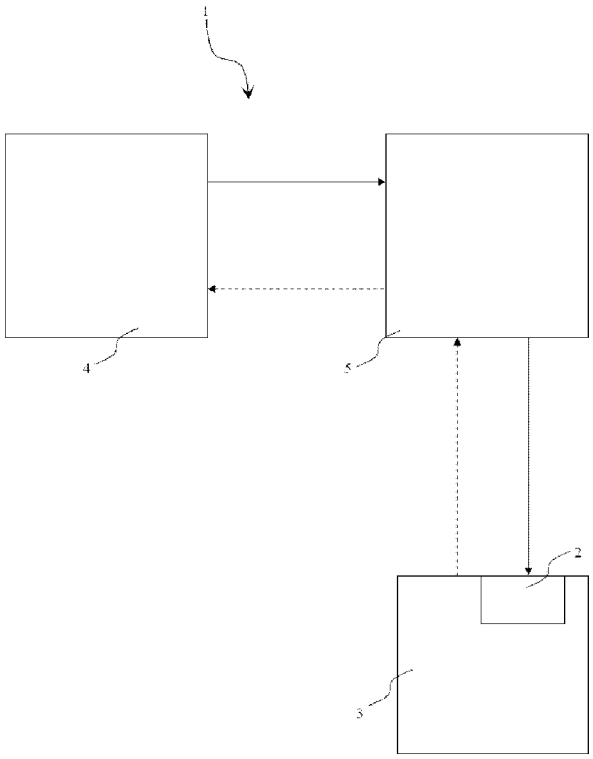
(74) Agent: **ANKARA PATENT BUREAU LIMITED**; Bestekar Sokak No.10, Kavaklidere, 06680 Ankara (TR).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, 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, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

[Continued on next page]

(54) Title: AN AUDIENCE MEASUREMENT SYSTEM

Figure 1



(57) Abstract: The present invention relates to measuring ratings of visual and/or audio media contents in which watermark is integrated by using a mobile communication device (3) comprising a receiver (2), and a server (4); wherein communication between the server (4) and the mobile communication device (3) is realized through a transmission medium (5).

WO 2011/010230 A1

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

AN AUDIENCE MEASUREMENT SYSTEM

Field of the Invention

The present invention relates to measuring audience ratings of media contents, in which watermark is integrated, by using mobile communication devices.

Prior Art

Audience measurement is the total of measurements of; audience rating, audience share, and measurements conducted for obtaining similar data. Audience rating is the average audience rating showing the percentage of average audience per minute in a program slot or time slot.

Today, advertising companies need measurement of the broadcast time that they receive from the broadcasting companies. These kinds of measurements are used for many purposes such as enabling to find out whether the broadcast reaches the target mass, whereby determining the advertisement costs. Nowadays, measurements of visual/audio media content ratings are generally made via devices installed in the dwellings of the audience. Information obtained from these devices is later sent to the central unit by means of communication devices (e.g. telephone modem). The information that reaches the central unit is examined by the experts and the results can be disclosed only after several hours. Rating measurement for radios is generally performed by the "diary method". In this method, the audience records all her/his radio listening of five minutes and more for a week in a diary and indicates in detail where (home, car, etc.) and how (radio, internet, mobile phone, etc.) they listened to the concerned radio stations.

The measurement techniques used at present are performed with the participation of a limited number of audience and they do not provide a real time measurement. Results of these measurement techniques can be obtained only after several hours.

Using real time measurement systems by means of electronic media requires use of a plurality of devices at the same time and considerably increases the cost. There are no systems which perform fast measurement with low cost using a single device (e.g. mobile phones). Furthermore, the measurement methods used at present are generally limited to measurement of television and radio broadcasting information. There are no measurement methods that can be used for any media content (e.g. music that is played, a film watched or a concert attended) at places like cinemas, restaurants, patisseries, etc.

The United States patent document **US2004111738A1** discloses a method and system for measuring audience ratings. It is mentioned herein that communication systems like SMS (short message system) are used in the system for disclosing the audience rating measurement results in a short period of time. It is indicated that the data detection means may be realized periodically, for example in cycles of between one second and 10 minutes.

The United States patent document **US2002138830A1** discloses a system wherein audience ratings are measured using mobile communication devices. The broadcast measurement system comprises concurrent use of many systems and elements such as monitor blocks, broadcast station, decoder, mobile stations.

The United States patent document **US2008126420A1** discloses measurement of audience ratings by the help of wireless communication devices. At least two wireless communication devices are required for audience rating measurement in the system; one at the audience and another at the center evaluating the measurement results.

Summary of the Invention

The objective of the present invention is to realize an audience measurement system which enables measuring media content ratings using a single mobile

communication device for each user in a wireless system without requiring an additional hardware.

Another objective of the invention is to realize an audience measurement system which enables measuring audience ratings of media contents into which audio or video watermarks are integrated.

A further objective of the invention is to realize an audience measurement system which provides promotion content to the user by using value added services (VAS) platform in measurement of audience ratings of media contents.

Detailed Description of the Invention

The Audience Measurement System realized to fulfill the objective of the present invention is illustrated in the accompanying figure wherein,

Figure 1 is the schematic block diagram of the audience measurement system.
Figure 2 is the flowchart of the inventive system.

The parts in the figure are each given a reference numeral where the numerals refer to the following:

1. Audience measurement system
2. Receiver
3. Mobile communication device
4. Server
5. Transmission medium
6. Method operating the system

A mobile communication device (3) comprising a receiver (2), and a server (4) are used in the inventive audience measurement system (1). The communication

between the server (4) and the mobile communication device (3) is carried out via a transmission medium (5).

The receiver (2) is a sensor like a microphone or a camera which can detect audio or video into which watermark is integrated. Watermarking is a data hiding technique that enables embedding data into audio, video or pictures.

The mobile communication device (3) is a wireless communication device comprising an audio/video sensor such as a microphone or camera, and a controller. The mobile communication device (3) transmits the media content received by the receiver (2) located therein to the server (4) via the transmission medium (5).

The server (4) is a center wherein the media content which is recorded by the receiver (2) is evaluated and wherein the information regarding the users who perform this recording is kept. Media contents are video/audio broadcasts of the broadcast time bought by the advertising company. These broadcasts can be video/audio broadcasts in television, radio, internet or any other medium. The server (4) provides various promotions to the users who participate in the measurement system by using value added services (VAS) platform in the measurement system.

The transmission medium (5) can be any wireless communication access medium such as 2G, 3G, Wi-Fi, GPRS (104).

The method (6) used in the audience measurement system (1) is comprised of the following steps;

- The watermark integrated media content being broadcasted on video/audio communication devices such as radio and television (101),

- The user commencing the audience measurement process by starting to record the media contents by means of the receiver (2) in the mobile communication device (3) (102),
- The signal of the watermark integrated media content being received by the receiver (103),
- The media content signal being transmitted by the mobile communication device (3) to the server (4) via a transmission medium (5) (104),
- The information in the media content, with which the signal transmitted to the server (4) is associated, being determined (105),
- Sending promotion information to the user (106),
- The information determined in step 105 being saved in the server (4) (107).

When the system is desired to be used, the watermark integrated media content is broadcasted on video/audio communication devices such as radio and television (101).

The user commences the audience measurement process by starting to record the media contents by means of the receiver (2) in the mobile communication device (3) (102).

The watermark integrated content which is being broadcasted is detected by the receiver (2) located in the mobile communication devices (3) (103). Data related to the programs embedded within the audio, video, picture, etc. signal is recorded by means of the mobile communication device (3) having the feature of a camera and/or speaker.

In the preferred embodiment of the invention, a watermark decoder is installed to the controller of the mobile communication device (3) via over-the-air (OTA).

The receiver (2) receives the signal of the media content containing watermark data and transmits it to the controller of the mobile communication device (3). This signal is decoded by using signal processing techniques with the help of the watermark decoder in the controller, whereby watermark data is obtained. This data may be a text or a number. Then the signal containing the watermark data is transmitted to the server (4) via a transmission medium (5) (104). This way the data in the media content is determined.

In one embodiment of the invention, an application which is capable of storing a signal containing watermark data is installed to the controller of the mobile communication device (3) via over-the-air. In the said embodiment, the media content (video/audio file) received by the receiver (2) and recorded in the mobile communication device (3) is transmitted to the server (4) by the mobile communication device (3) via a transmission medium (5) without being decoded (104). Then the watermark data in this file is decoded by the help of the watermark decoder provided in the server (4) by using signal processing techniques, whereby watermark information data is obtained.

The media content, which is associated with the signal that is reached to the server (4) having value added services (VAS) platform, is determined (105). With this content, information like the date and hour that the advertisement is watched is determined.

The promotion to be provided by the service is determined by the platform (VAS). The information that the user will receive depending on this platform is transmitted to the user by a system (e.g. short message system) determined by the service (106). This information can be any promotion information (e.g. winning prepaid minutes, music, logo, etc.) determined by the platform.

The information in the media content associated with the signal sent by the user to the platform (VAS) is recorded by the server (4) to be interpreted later (107). This

interpretation includes information such as which user watched which media content on which date and hour. By recording the user information in addition to the media content information, user behavior is enabled to be reported and a better quality service (customized service) is offered to the users according to these reports.

In the inventive audience measurement system (1), audience behavior can be measured in real time and the audience results can be obtained much faster compared to the available techniques.

In the inventive audience measurement system (1), while media contents can be sent to the server (4) during recording, they can also be recorded by the mobile communication device (3) and transmitted to the server (4) later.

In one embodiment of the invention, media content audience measurement can be performed in replay broadcasts such as in internet broadcasting.

In one embodiment of the invention, location information of the users who are involved in the media content audience measurement system (1) can be acquired. This way, which media contents are watched more in which regions is determined. Thus by using this information, advertiser companies can form different strategies specific for regions for the products to be advertised.

In the inventive audience measurement system (1), the watermark integrated data not being sensed by the users can be an important criterion for system performance. When such an application is intended to be used, in order for the watermarked (integrated watermark) information to be found within the recorded signals, in one embodiment of the invention, known bits are used at the header and footer of the watermark information package.

In one embodiment of the invention, the user turns on the receiver (2), which she/he will use for recording media content, after the broadcast of the media content starts. In this embodiment, the user activates the receiver (2) by turning it on after media contents are started to be broadcasted, and then starts to record the broadcast.

In another embodiment of the invention, the user turns on the receiver (2), which she/he will use for recording media content, before the broadcast of the media content starts. In this embodiment, the user activates the receiver (2) by turning it on before the media contents are started to be broadcasted, and starts recording after the broadcast starts.

A low cost measurement system (1) is realized with the inventive audience measurement system (1) using a single mobile communication device (3). Furthermore, a wider participation to the audience measurement system (1) is enabled by the use of mobile communication devices (3) like cellular phones used very widely nowadays, whereby a more accurate measurement is realized.

The inventive audience measurement system (1) has enabled to embed various information into the media content output from any audio and/or video broadcasting device and then to measure the media content ratings by the help of these information. Although main purpose of the invention is to measure the watermark integrated media contents, the invention can also be used for measuring any media content. In these types of measurements, the media content is not required to contain a watermark message. In these types of measurements where watermark is not integrated, special tones for audio files and logos for video files can also be accepted as watermark information. The mobile communication device (3) used in the invention is a device accompanying the user and comprising an audio and/or video receiver (2) having the features of a microphone and/or camera. An additional hardware is not incorporated to the mobile communication device (3) in order to measure the media content rating

and to provide various promotions to the users participating in these measurements. Therefore a cost reduction has been provided in forming the media content audience measurement system (1).

It is possible to develop a wide variety of embodiments of the inventive audience measurement system (1). The invention cannot be limited to the examples described herein and it is essentially according to the claims.

CLAIMS

1. An audience measurement system (1), wherein a mobile communication device (3) having a receiver (2), and a server (4) are used and which **comprises** a transmission medium (5) which enables communication between the server (4) and the mobile communication device (3), and **characterized by** the steps of
   - the watermark integrated media content being broadcasted on video/audio communication devices such as radio and television (101),
   - the user commencing the audience measurement process by starting to record the media contents by means of the receiver (2) in the mobile communication device (3) (102),
   - the signal of the watermark integrated media content being received by the receiver (103),
   - the media content signal being transmitted by the mobile communication device (3) to the server (4) via a transmission medium (5) (104),
   - the information in the media content, with which the signal transmitted to the server (4) is associated, being determined (105),
   - sending promotion information to the user (106),
   - the information in the media content, with which the signal transmitted to the server (4) is associated, being saved in the server (4) (107).

2. An audience measurement system (1) according to Claim 1, **characterized in that** the media content signal, which is received by the receiver (2) and which contains watermark data, is decoded by the help of the watermark decoder at the controller of the mobile communication device (3) whereby

watermark data is obtained, and then transmitted to the server (4) via a transmission medium (5).

3. An audience measurement system (1) according to Claim 1, **characterized in that** the media content signal, which is received by the receiver (2) and which contains watermark data, is transmitted to the server (4) by the mobile communication device (3) via a transmission medium (5) without being decoded and then the transmitted signal is decoded by the help of the watermark decoder provided in the server (4) whereby watermark data is obtained.

4. An audience measurement system (1) according to any of the preceding claims, **characterized in that** the recorded media content is evaluated and the user information regarding the user who performs this recording is stored in the server (4) thereof.

5. An audience measurement system (1) according to any of the preceding claims, **characterized in that** the server (4) thereof uses value added services platform in the measurement system.

6. An audience measurement system (1) according to Claim 5, **characterized in that** various promotions are offered to the user by means of the value added services platform that is used by the server (4) thereof in the measurement system.

7. An audience measurement system (1) according to any of the preceding claims, **characterized in that** real time measurement can be carried out by sending the media contents recorded by the receiver (2) to the server (4) during recording.

8. An audience measurement system (1) according to Claims 1 to 6, **characterized in that** the media contents recorded by the receiver (2) are recorded and sent to the server (4) subsequently.

9. An audience measurement system (1) according to any of the preceding claims, **characterized in that** measurement is also carried out in replay broadcasts.

10. An audience measurement system (1) according to any of the preceding claims, **characterized in that** user information of the users performing the measurement is obtained.

11. An audience measurement system (1) according to any of the preceding claims, **characterized in that** location information of the users performing the measurement is obtained.

12. An audience measurement system (1) according to any of the preceding claims, **characterized in that** known bits are used at the header and footer of the watermark information package when it is desired that the watermark integrated data is not sensed by the users.

Figure 1

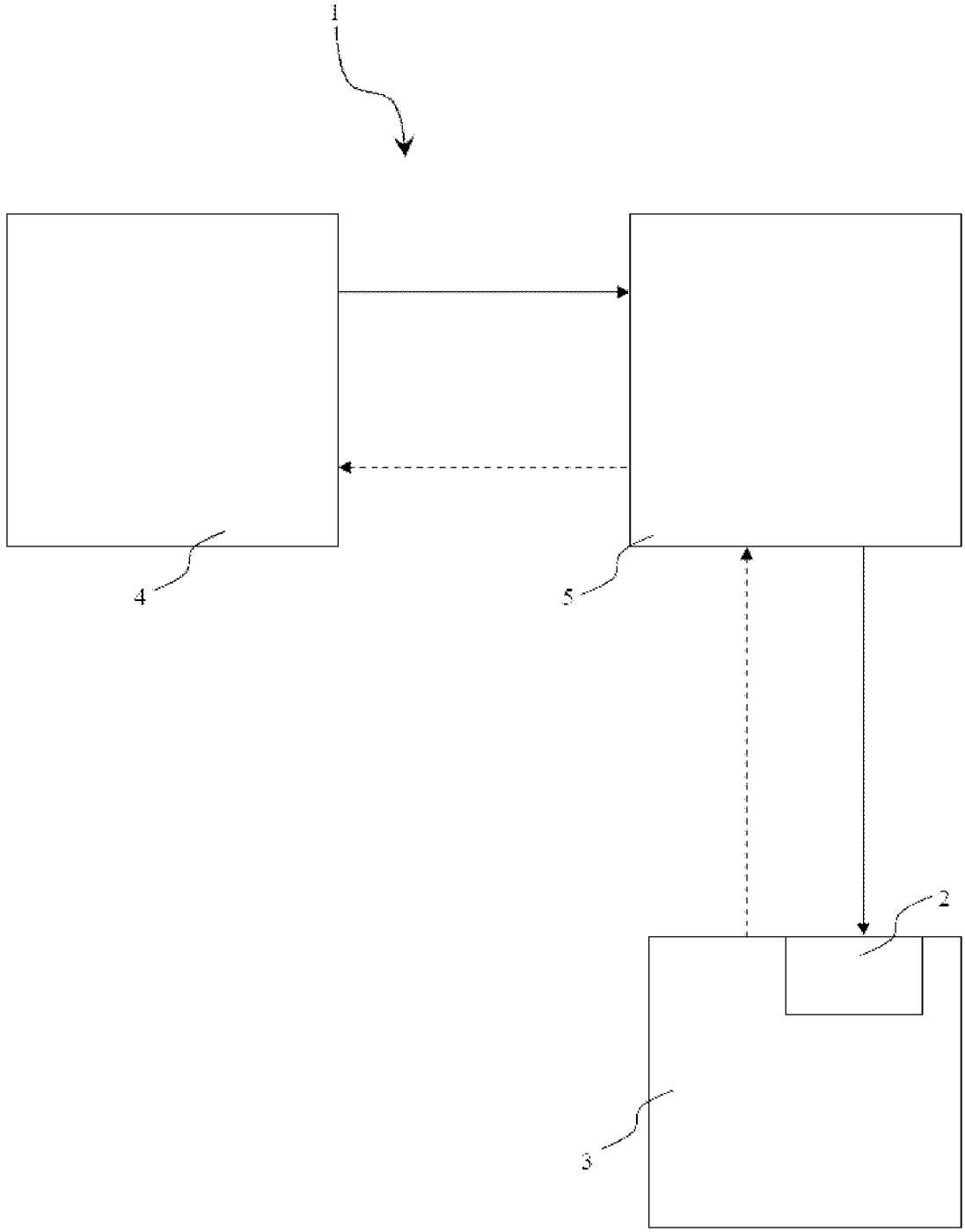
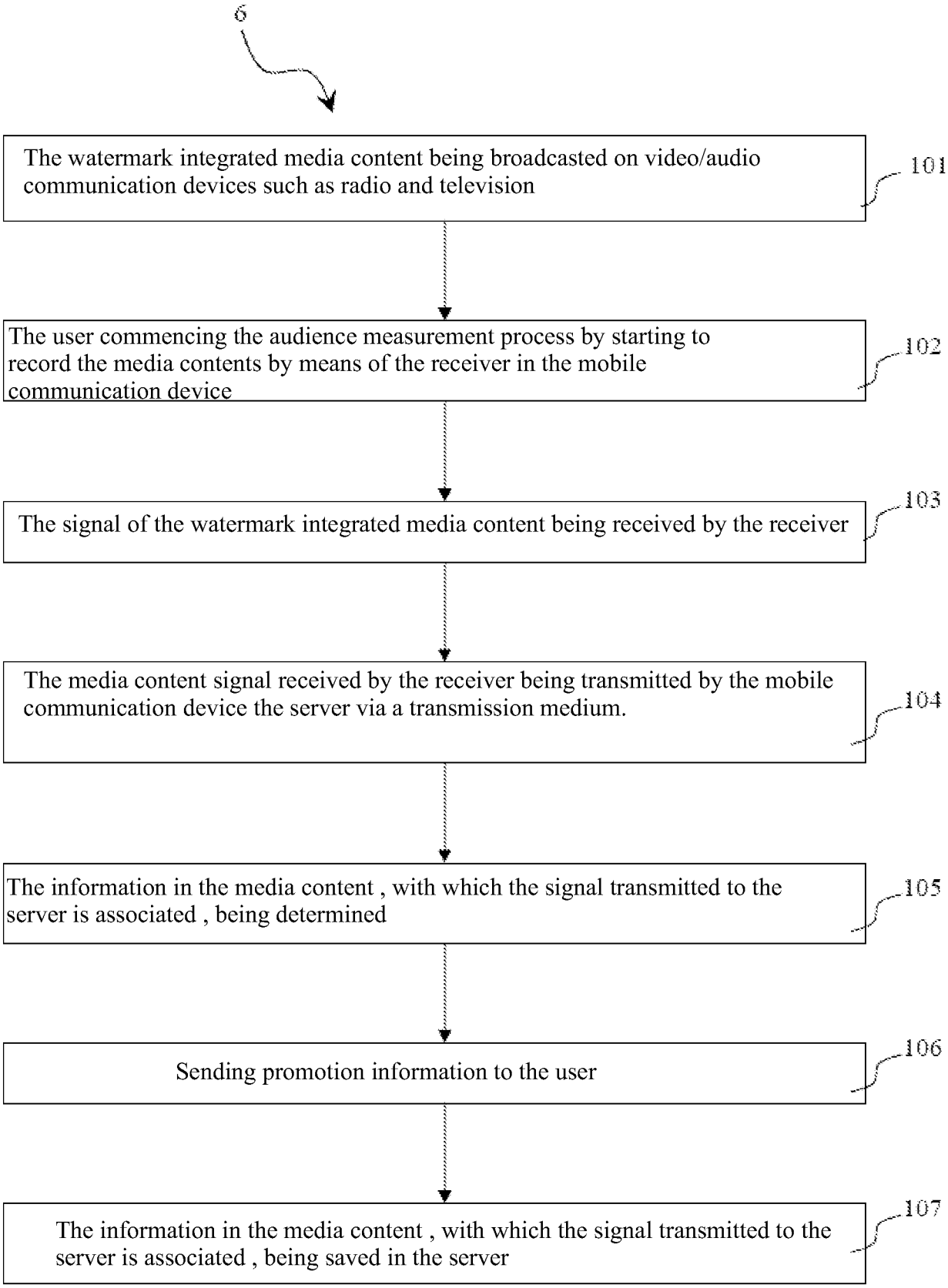


Figure 2


6
The watermark integrated media content being broadcasted on video/audio communication devices such as radio and television
101
The user commencing the audience measurement process by starting to record the media contents by means of the receiver in the mobile communication device
102
The signal of the watermark integrated media content being received by the receiver
103
The media content signal received by the receiver being transmitted by the mobile communication device the server via a transmission medium.
104
The information in the media content , with which the signal transmitted to the server is associated , being determined
105
Sending promotion information to the user
106
The information in the media content , with which the signal transmitted to the server is associated , being saved in the server
107

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2010/052609

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04H60/61
ADD.

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)
H04H

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 418 692 A2 (NIELSEN MEDIA RES INC [US]) 12 May 2004 (2004-05-12) * abstract paragraphs [0018] - [0024], [0028] - [0032], [0036] - [0039], [0042] - [0049], [0056] - [0068] figures 3,5,7	1-12
X	US 2007/271300 A1 (RAMASWAMY ARUN [US]) 22 November 2007 (2007-11-22) * abstract figures 1,2 paragraphs [0021] - [0025], [0028] - [0033], [0060] - [0062]	1-12

-/--

[X] Further documents are listed in the continuation of Box C.

[X] 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	Date of mailing of the international search report
8 September 2010	21/09/2010

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Dobbelaere, Dirk

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2010/052609

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 2007/136782 A1 (RAMASWAMY ARUN [US] ET AL) 14 June 2007 (2007-06-14) * abstract paragraphs [0005] - [0007], [0023].-[0036]; figures 2,4	1-12
A	WO 2004/054147 A1 (KONINKL PHILIPS ELECTRONICS NV [NL]; HICKMAN ANDREW J [GB]) 24 June 2004 (2004-06-24) * abstract page 3, line 10 - page 4, line 24 page 5, line 27 - page 6, line 26	1-12
A	US 2003/005430 A1 (KOLESSAR RONALD S [US]) 2 January 2003 (2003-01-02) * abstract figures 2-4 paragraph [0014] - paragraph [0025]	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2010/052609

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1418692 A2	12-05-2004	EP 1458124 A2	15-09-2004
		EP 1418693 A2	12-05-2004
US 2007271300 A1	22-11-2007	CA 2588217 A1	26-05-2006
		EP 1829368 A2	05-09-2007
		US 2010153982 A1	17-06-2010
		WO 2006055971 A2	26-05-2006
US 2007136782 A1	14-06-2007	NONE	
WO 2004054147 A1	24-06-2004	AU 2003283666 A1	30-06-2004
US 2003005430 A1	02-01-2003	AU 2002312579 B2	14-12-2006
		BR 0210625 A	10-08-2004
		CA 2451819 A1	09-01-2003
		CN 1543746 A	03-11-2004
		DE 10297031 T5	11-11-2004
		EP 1410635 A1	21-04-2004
		GB 2396467 A	23-06-2004
		HK 1071003 A1	06-02-2009
		IL 159372 A	20-07-2009
		JP 4392495 B2	06-01-2010
		JP 2004531996 T	14-10-2004
		MX PA03011967 A	03-06-2004
		PL 367449 A1	21-02-2005
		WO 03003741 A1	09-01-2003
		ZA 200309919 A	27-09-2004