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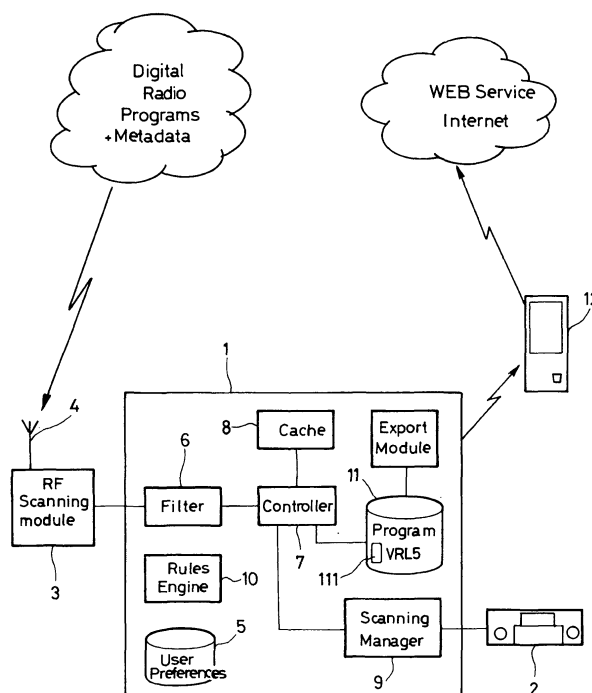
(54) **Digital radio apparatus and method for the reception of digital radio programs**

(57) Digital radio apparatus adapted to operate on audio format comprising digital radio programs and program-related metadata, **characterized in that** it comprises :
- means for filtering received information related to pre-

ferred digital radio programs as a function of a comparison between the metadata and user preferences stored in the apparatus,
- means for rendering a preferred digital radio program to the user.

Associated method.

FIG_1



Description

[0001] The present invention is related to a digital radio apparatus. It concerns as well a method for the reception of digital radio programs for such a digital radio apparatus.

[0002] Nowadays, with the new technologies of broadcasting audio programs using analog/digital radio transmission techniques (e.g. RDS/DAB+, T-DMB), the broadcasters are capable to offer electronic program guides and text message service.

[0003] Currently, radio devices offer a scanning function on live broadcast channels. On user demand, such radio devices start scanning and then stop on first tuned frequency.

[0004] The existing solution is not good enough as the user can not specify his program type preferences.

[0005] There are web sites providing personalized web radio stations, despite the fact that they offer a solution to end user to create his own playlists based on music-on-demand model (such services may be found at the following links are for example : www.deezer.com, www.musicoverly.com, www.pandora.com). Such solutions are not complete to be used by existing radio broadcasters to gain more audience on their web sites.

[0006] The main technical problem is how to be able to scan and seek a specified type of digital radio broadcasting program from thousands of programs based on user preferences.

[0007] The present invention aims at selecting the appropriate program for each user by gathering profile information.

[0008] The object of the present invention, according to an embodiment, is a digital radio apparatus adapted to operate on audio format comprising digital radio programs and program-related metadata, **characterized in that** it comprises :

- means for filtering received information related to preferred digital radio programs as a function of a comparison between the metadata and user preferences stored in the apparatus,
- means for rendering a preferred digital radio program to the user.

[0009] According to an embodiment of the invention, the filtering means are adapted to output preferred metadata related to digital radio programs corresponding to the user preferences.

[0010] According to an embodiment of the invention, when the filtering means outputs preferred metadata, a controlling means is adapted to command a radio scanning management means to stop scanning radio frequencies.

[0011] According to an embodiment of the invention, when the filtering means output preferred metadata, a URL bookmark related to the corresponding detected preferred radio program is stored in a program URL da-

tabase stored in the apparatus.

[0012] According to an embodiment of the invention, the list of URL bookmarks are exported by an export module via radio links to a remote device capable of retrieving the preferred radio programs from the related broadcaster website via an internet connection.

[0013] The object of the present invention, according to an embodiment, is also a method for the reception of digital radio programs for a digital radio apparatus adapted to operate on audio format comprising digital radio programs and program-related metadata, **characterized in that** the method comprises the following steps :

- filtering received information related to preferred digital radio programs as a function of a comparison between the metadata and user preferences stored in the apparatus,
- rendering a preferred digital radio program to the user.

[0014] Other objects and further features of the present invention will be apparent from the following detailed description when read in conjunction with the accompanying drawing:

Fig. 1 schematically illustrates an embodiment of a digital radio scanning device according to an embodiment of the invention.

[0015] A description will hereinafter be given of embodiments of the present invention, by referring to the drawings

[0016] The embodiment illustrated in the figure 1 shows a digital radio apparatus 1.

[0017] A user starts by specifying his preferences via a user interface (not referenced) of the digital radio apparatus 1, such preferences information are saved in the "User Preferences" database 5 of the apparatus 1. the user preferences comprise for example his hobbies, favorite songs or music styles, his points of interests, etc. Further, the user preferences may comprise a user profile comprising different sets of criteria which vary upon the time.

[0018] A RF scanning module 3, via a RF antenna 4, starts scanning the available frequencies.

[0019] Digital radio programs are transmitted by broadcasters on the waves. Each program is provided with metadata. The metadata schema may be created simply to represent the radio program interests of users. For example, each metadata may have a vector containing several interests, each of them having a rating.

[0020] When scanning the radio spectrum, a filter 6 operates a comparison between each of the received metadata and data contained in the user preferences database. The filter 6 acts as a network interface, delivering relevant metadata to a controller 7.

[0021] The filter is continuously downloading and evaluating metadata. Any item of metadata that matches the

criteria of the user preferences is passed to the controller. The controller evaluates each metadata and its relevancy on rules stored in a rules engine 10. Depending on the current state of the available radio program (cached files, available streams), the controller will decide whether to replace the current one.

[0022] A cache module 8 is responsible for managing the cache memory and ensuring that a good variety of radio programs is always available.

[0023] Once a metadata is detected as fitting with the user preferences, the controller 7 commands a radio scanning manager 9 to stop scanning radio frequencies. The controller 9 commands the storage of a URL bookmark related to the corresponding detected radio program in a program URL database.

[0024] An entire file 111 (or a part thereof) of the program bookmarks store in the database 11 may be exported from the digital radio apparatus towards a third party terminal 12, which could be a PDA, Smartphone or PC, by using a wireless communication connection between both apparatus 1 and terminal 12.

[0025] The user will then be able to access the broadcasters' websites via an internet connection and request the downloading of his preferred radio programs corresponding to the imported file 111.

[0026] Possibly, the apparatus 1 may incorporate a dedicated analysis module of the usage history and feedbacks then modifies the user preferences appropriately.

[0027] The apparatus is linked to a program renderer module for the audio output of the apparatus. It converts the digital stream or audio file into actual sound than can be heard by the user.

[0028] The invention allows to build a service to link the radio broadcasting and internet multi-media services.

[0029] It also allows nomad users to continue listening to their preferred digital radio programs everywhere by using their internet connection.

[0030] Besides, the invention doesn't limit the radio station broadcasting to a specific coverage area any more, and promotes the use of online streaming media delivery service.

Claims

1. Digital radio apparatus adapted to operate on audio format comprising digital radio programs and program-related metadata, **characterized in that** it comprises :

- means for filtering received information related to preferred digital radio programs as a function of a comparison between the metadata and user preferences stored in the apparatus,
- means for connecting with means for rendering a preferred digital radio program to the user.

2. Apparatus according to claim 1, **characterized in**

that the filtering means are adapted to output preferred metadata related to digital radio programs corresponding to the user preferences.

3. Apparatus according to claim 1 or 2, **characterized in that**, when the filtering means outputs preferred metadata, a controlling means is adapted to command a radio scanning management means to stop scanning radio frequencies.

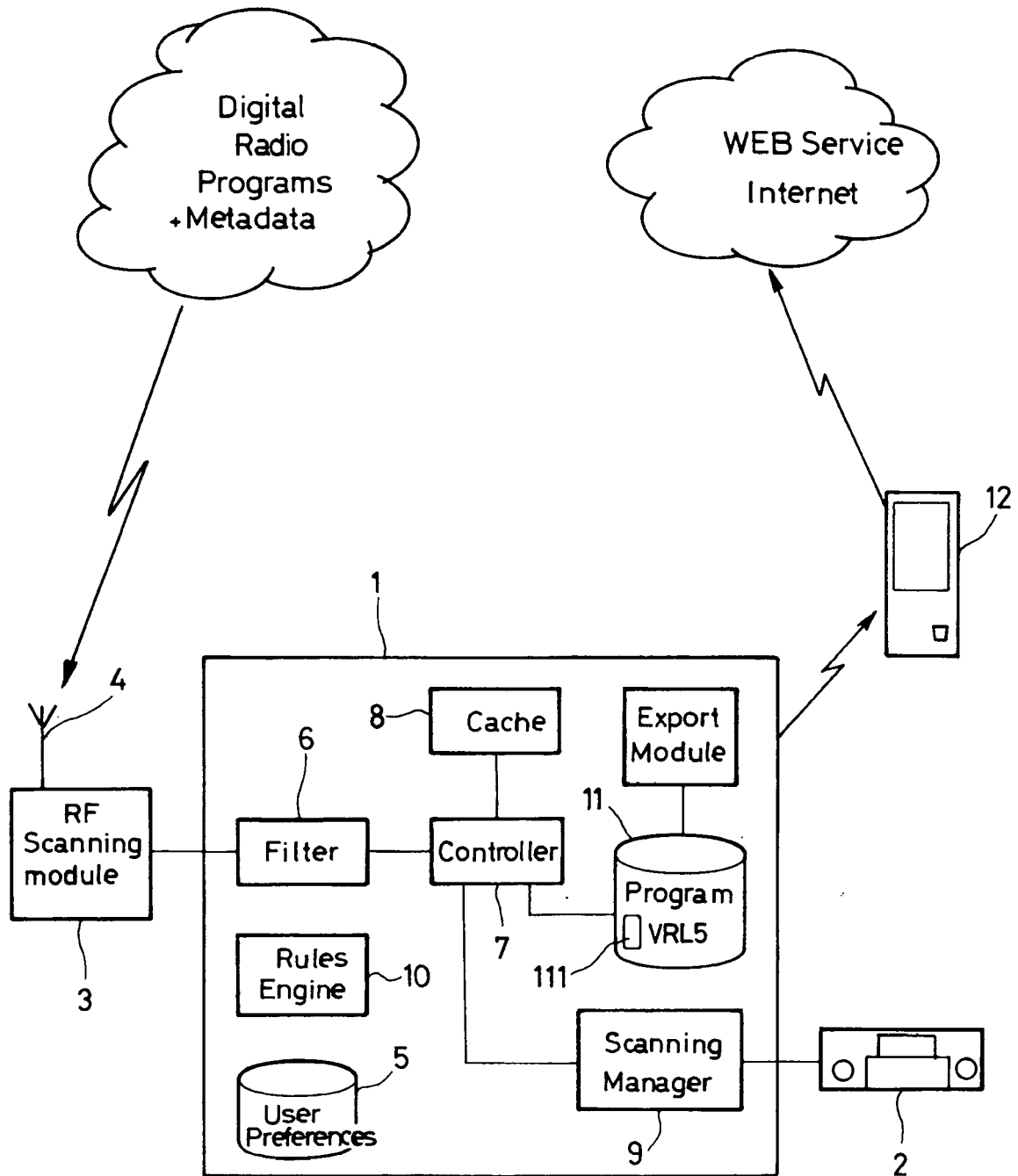
4. Apparatus according to any of claim 1 to 3, **characterized in that** when the filtering means output preferred metadata, a URL bookmark related to the corresponding detected preferred radio program is stored in a program URL database stored in the apparatus.

5. Apparatus according to any of claim 1 to 4, **characterized in that** the list of URL bookmarks are exported by an export module via radio links to a remote device capable of retrieving the preferred radio programs from the related broadcaster website via an internet connection.

6. Method for the reception of digital radio programs for a digital radio apparatus adapted to operate on audio format comprising digital radio programs and program-related metadata, **characterized in that** the method comprises the following steps :

- filtering received information related to preferred digital radio programs as a function of a comparison between the metadata and user preferences stored in the apparatus,
- connecting with rendering means for rendering a preferred digital radio program to the user.

FIG_1





EUROPEAN SEARCH REPORT

Application Number
EP 08 30 5816

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|---|---|--|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
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| | | | TECHNICAL FIELDS SEARCHED (IPC) |
| | | | H04H |
| The present search report has been drawn up for all claims | | | |
| Place of search The Hague | | Date of completion of the search 27 May 2009 | Examiner Van Hoorick, Jan |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p> | | | |

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 30 5816

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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27-05-2009

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