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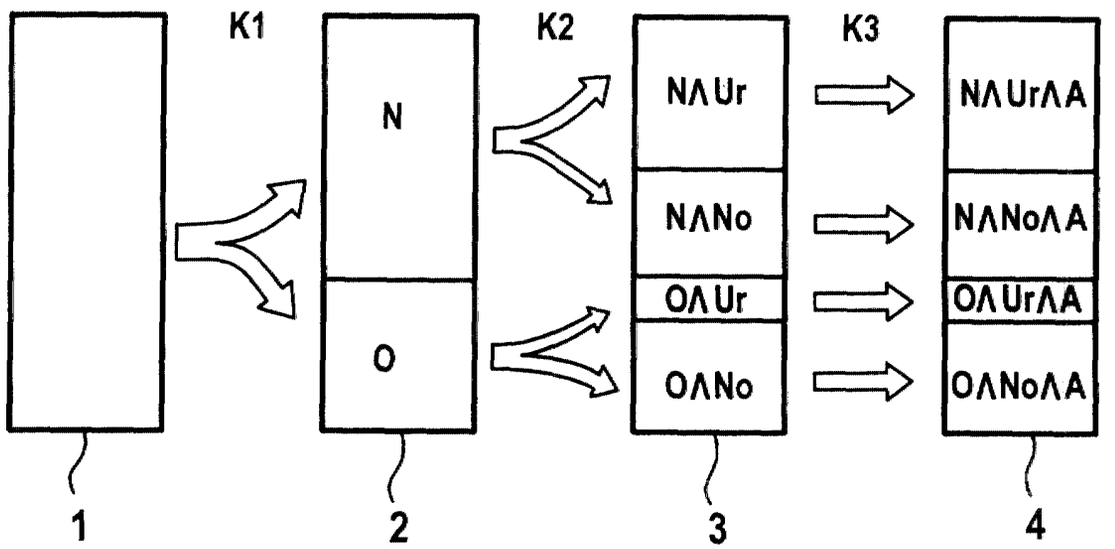
(54) Method for defining an order of priority in reproducing traffic messages

(57) Method for defining an order of release for reproduction of received broadcast traffic messages to be used in a navigation system, wherein new broadcast traffic messages which are to be reproduced for the first time are given priories over broadcast traffic messages which have been reproduced.

Fig. 3



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Description

[0001] The invention relates to a method for defining an order of priority in reproducing traffic messages and to a receiver using the method.

[0002] US Patent 5,438,687 discloses a radio receiver using the Radio Data System (RDS) defined by the European Broadcasting Union (EBU) in Brussels. In a practical embodiment of this receiver a selection of route relevant information is provided, in which only those traffic messages are being released for reproduction, exceeding in priority or urgency a certain threshold. An indication for such urgency may be attributed to the traffic message at the transmitter end and such indication may be included in coded form in the digital traffic message code format. However, the traffic messages having a priority or urgency exceeding said certain threshold, are being released for reproduction at their occurrence in the received signal. The driver is to make his own interpretation as to the urgency or priority of the reproduced traffic messages. Furthermore, it may well be that dependent on the time the receiver is switched on, relevant traffic data may be missed.

[0003] In consequence, amongst other things, it is an object of the present invention to provide a method for defining an order of priority in reproducing traffic messages at the receiving end allowing to inform the driver continuously of the most relevant traffic information.

[0004] Now therefore, according to one of its aspects the invention is characterized by prioritizing new broadcast traffic messages which are to be reproduced for the first time over broadcast traffic messages which have been reproduced. This method is in particular applicable in a system for repetitive reproduction of traffic messages, which avoids the driver from missing relevant traffic data.

[0005] Preferably said method is characterized by continuously storing the received broadcast traffic messages, these received broadcast traffic messages being released for actual reproduction at any re-initiation of the method.

[0006] It is another object of the present invention to provide a receiver for using the above method, comprising a tuner stage having an output, a decoder stage having an input connected to the output of the tuning stage for decoding digital broadcast traffic messages. In accordance with the invention, such receiver is characterized by storage means for storing received broadcast traffic messages, control means for controlling the release for reproduction of said received broadcast traffic messages, and message reproduction means for reproducing said released broadcast traffic messages, said control means prioritizing for reproduction new broadcast traffic messages which are to be reproduced for the first time over broadcast traffic messages which have been reproduced.

[0007] A preferred embodiment of a receiver according to the invention is characterized by said storage means having a non-volatile memory for continuously storing the received broadcast traffic messages latest received, said control means releasing for reproduction said stored broadcast traffic messages at a re-initiation of the receiver.

[0008] These and further aspects and advantages of the invention will be discussed more in detail hereinafter with reference to the disclosure of preferred embodiments, and in particular with reference to the appended Figures that show:

Figure 1 is an input table representing various traffic messages in a certain reference sequence order;
Figure 2 is an output table representing information content of various traffic messages in preferred order;
Figure 3 shows process of sorting in various steps;
Figure 4 is an applicable flow chart;
Figure 5 shows a receiver according to the invention implementing the invention

[0009] The table of Figure 1 shows traffic data inputted and stored in a local memory of an RDS radio receiver at a certain point in time in a certain reference sequence order. The stored traffic data is continuously actualised by replacing traffic messages, which have become obsolete and/or already have been represented to the user, by newly received traffic data. Reproduction of traffic data can be in audible form through speech synthesis or visually by displaying the messages in textform.

The table shows under a column header "Road", location code identifiers, indicating the specific road or geographical area to which the respective stored traffic messages pertain, e.g. expressed in roadnumbers or area codes. Under a column header "Location/extent" a closer definition of the location of interest is given, such as the exact place and/or direction of the event referred to in the respective traffic messages. Under a column header "Event", the event of interest is characterised, such as fog, traffic jam, queu lengths, etc.. In the column headed with "Urgency" the respective traffic messages are being classified in two classes of urgency: normal or urgent. The traffic messages classified as urgent are to be prioritised in reproduction over the normal traffic messages. Under the column "Status" an indication with regard to the novelty of the traffic messages: new traffic messsages which have not yet been represented to the user are indicated as new and are given the characterisation old, once they have been represented. Where the information stored under the columns headed with "Road", "Location/extent", "Event" and "Urgency" are being transmitted and received along with the traffic messages, the data in this column "Status" is being locally generated.

The most righthand column is indicating a reference sequence order of the stored messages, which is merely to illustrate the effect of the invention on the order of

presentation or reproduction of the respective stored traffic messages. In a conventional receiver the order of presentation to the user is defined by this reference sequence order.

[0010] Figure 2 shows the effect of the method of sorting of traffic messages in accordance with the invention when applied to the traffic messages included in the table of Figure 1. The sorted sequence order indicated in the most right hand column defines the order of priority for presentation or reproduction, such that the traffic message having highest urgency is placed in the top row, whereas the traffic message having lowest urgency is placed in the bottom row of the table. The traffic message having reference sequence order 02 now being placed at the top urgency row of the list, followed in decreasing order of urgency by the traffic message with respective reference sequence order 05, 03, 04 and 01.

[0011] Figure 3 shows the sorting principle which is used to go from the message sequence order 01-05 of Figure 1 to the message sequence order 02,05,03,04,01 of Figure 2 in memory listings 1-4. In memory list 1 the messages received are being stored in any arbitrary order, e.g. in order of reception. In a first sorting step a sorting key K1 is used to divide the messages in memory list 1 in a category of newly received, not yet reproduced traffic messages on the one hand and a category of traffic messages, which have been reproduced at least once on the other hand. The new messages being are stored in a part N of a memory list 2 and the old messages in a part 0 of the memory list 2. In a second sorting step a second sorting key K2 is used to order the traffic messages in either of both above classifications in accordance with the urgency of the respective messages. In both N and O parts of the memory list 1, urgent traffic messages Ur are being separated from normal traffic messages, resulting in the parts N and 0 of the memory list 2 being subdivided into respective parts NΛUr, NΛNo, OΛUr **and** OΛNo as shown in memory list 3. A third sorting key K3 is used to place the traffic messages in each of the respective parts NΛUr, NΛNo, OΛUr **and** OΛNo of memory list 3 in alphabetic order of location. This results in a listing of traffic messages as shown in the memory list 4, or when starting from the table of Figure 1 in the order sequence as shown in the table of Figure 2. The resulting sequence order defines the order of release for reproduction of received broadcast traffic messages, in which new broadcast traffic messages which are to be reproduced for the first time are being prioritized over broadcast traffic messages which have been reproduced, in which the broadcast traffic messages within said categories are being ordered in reproduction priority in accordance with the urgency of the messages and within the order of urgency in alphabetic order of location.

[0012] Figure 4 shows the sorting method according to the invention in a flow diagram, starting from an initiating of the method in step 5. The method is applied to all broadcast traffic messages received either after the initiating step 5 or already available at the receiving end by a continuous storage of traffic messages. The initiating step 5 is followed respectively by first to third sorting steps 6-8, providing the result of the sorting method in step 9 and the ending of the method in step 10.

Figure 5 a receiver for using the method in accordance with the invention comprising an RF input circuit 11 an input thereof being coupled to an antenna A and an output thereof being coupled to a mixer stage 12, supplied with a local oscillator signal from a tunable oscillator 13, a selective intermediate frequency (IF) amplifier 14 for selecting and amplifying an IF signal, a decoder stage 15 for decoding digital broadcast traffic messages, storage means 16 for storing received broadcast traffic messages, control means 17 for controlling the release for reproduction of said received broadcast traffic messages, and traffic message reproduction means 18, comprising a display, for reproducing said released broadcast traffic messages. The reception and decoding and selection of traffic messages is as such known: the RF input circuit 11, the mixer stage 12 and tunable oscillator 13 constitute a tuner stage, in which a wanted RF broadcast signal is selected and downconverted into an IF signal. The IF signal after being selectively amplified in the selective intermediate frequency (IF) amplifier 14, is being decoded in the decoder stage 15 for decoding and selecting traffic messages, which are supplied to the storage means 16. The storage means 16 comprise first to fourth memory banks 19-22 for storing therein respectively the traffic messages of the memory lists 1-4 of Figure 3. The first memory bank 19 may have a non-volatile memory in order for the receiver to continuously store the received broadcast traffic messages latest received. Said control means 17 provide for the release for reproduction of said stored broadcast traffic messages at a re-initiation of or switching on the receiver. The traffic messages after being stored and reordered in the first to fourth memory banks 19-22 are released for reproduction in traffic message reproduction means 18 in the sequence order of the memory list 4 in the fourth memory bank 22.

[0013] The person skilled in the art of traffic message handling will recognize further policies to be followed within the ambit of the present invention, the scope of which has justfully been determined by the appended Claims hereinafter.

Claims

1. Method for defining an order of release for reproduction of received broadcast traffic messages, **characterized by** prioritizing new broadcast traffic messages which are to be reproduced for the first time over broadcast traffic messages which have been reproduced.

2. Method according to claim 1, **characterized by** said

new broadcast traffic messages being ordered in reproduction priority in accordance with the urgency of the respective traffic messages.

3. Method according to claim 1 or 2, **characterized by** the received traffic messages after reproduction being ordered in priority for repetitive reproduction in accordance with the urgency of the respective traffic messages.

4. Method according to one of claims 1 to 3, **characterized by** the traffic messages being alphabetically ordered in reproduction priority with respect to the name of location to which said traffic messages respectively pertain.

5. Method according to one of claims 1 to 4 **characterized by** continuously storing the received broadcast traffic messages, these received broadcast traffic messages being released for actual reproduction at any re-initiation of the method.

6. Receiver for using the method of claim 1 comprising a tuner stage and coupled thereto a decoder stage having an input connected to the output of the tuning stage for decoding digital broadcast traffic messages, **characterized by** storage means for storing received broadcast traffic messages, control means for controlling the release for reproduction of said received broadcast traffic messages, and message reproduction means for reproducing said released broadcast traffic messages, said control means prioritizing for reproduction new broadcast traffic messages which are to be reproduced for the first time over broadcast traffic messages which have been reproduced.

7. Receiver according to claim 6, **characterized by** said control means ordering newly received traffic messages in reproduction priority in accordance with the urgency of the respective traffic messages.

8. Receiver according to claim 6 or 7, **characterized by** said control means ordering received traffic messages after once being reproduced in reproduction priority in accordance with the urgency of the respective traffic messages.

9. Receiver according to one of claims 6 to 8, **characterized by** said control means ordering said traffic messages alphabetically in reproduction priority with respect to the name of location to which said traffic messages respectively pertain.

10. Receiver according to one of claims 6 to 9, **characterized by** said storage means having a non-volatile memory for continuously storing the received broadcast traffic messages latest received, said control means releasing for reproduction said stored broadcast traffic messages at a re-initiation of the receiver.

Fig. 1

Road	Location/extent	Event	Urgency	Status	Reference sequence order
A15	Place<x>,direction<y>	10 km dragging traffic	Normal	Old	O1
A15	Place<x>, direction<z>	Carcrash	Urgent	New	O2
B2	Place<w>	Fog	Normal	New	O3
B96	Place<a>, direction<s>	Roadblock	Urgent	Old	O4
A10	Place<b>, direction<n>	Crowded traffic	Normal	New	O5

Fig. 2

Road	Location/extent	Event	Urgency	Status	Sorted sequence order
A15	Place<x>,direction<z>	Carcrash	Urgent	New	O2
A10	Place<b>, direction<n>	Crowded traffic	Normal	New	O5
B2	Place<w>	Fog	Normal	New	O3
B96	Place<a>, direction<s>	Roadblock	Urgent	Old	O4
A15	Place<x>, direction<y>	10 km dragging traffic	Normal	Old	O1

Fig. 3

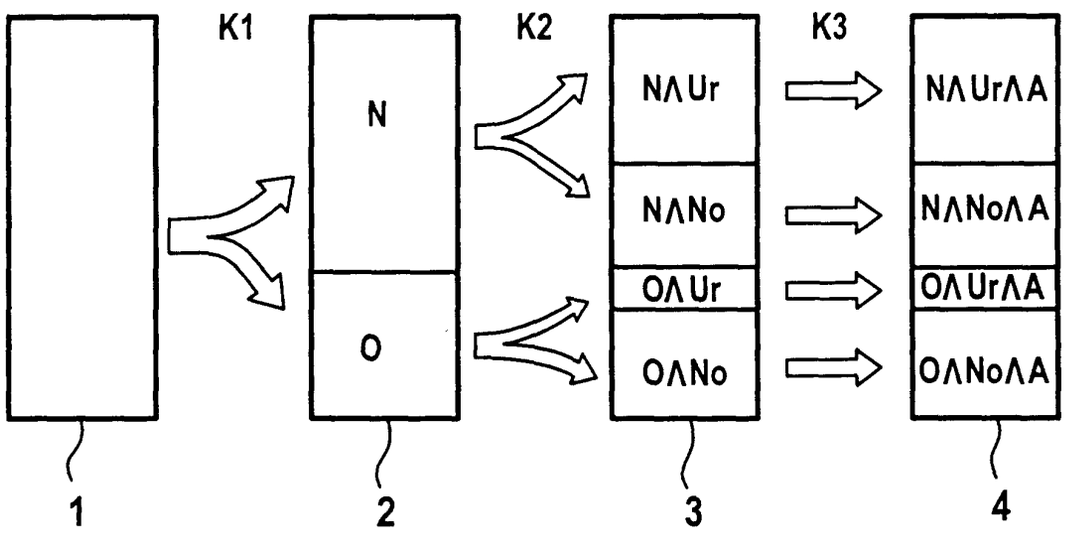

Fig. 4

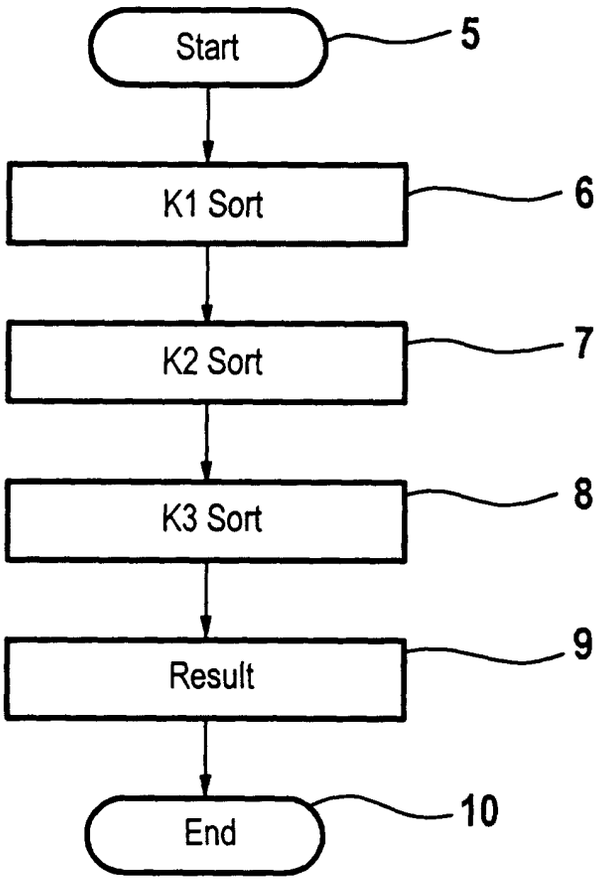
Start
5
K1 Sort
6
K2 Sort
7
K3 Sort
8
Result
9
End
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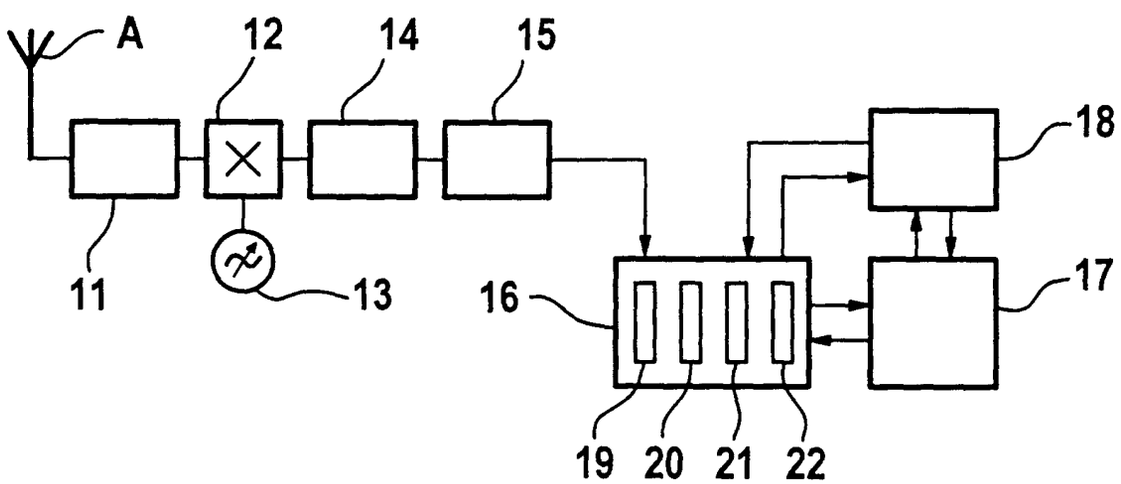
Fig. 5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EUROPEAN SEARCH REPORT

Application Number
EP 00 20 1459

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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

G08G
G11B
H04H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 October 2000	Flores Jiménez, A

CATEGORY OF CITED DOCUMENTS

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