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(54) **Title:** DOUBLY COMPATIBLE LOSSLESS AUDIO BANDWIDTH EXTENSION

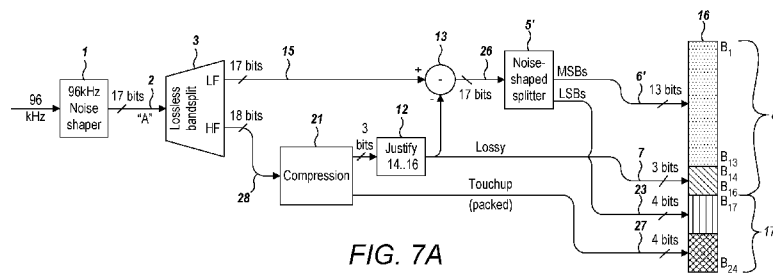


FIG. 7A

(57) **Abstract:** An encoder for digital audio signals at a higher sample rate creates a stream for consumer distribution at a lower sampling rate, with compatibility for standard PCM players without a decoder. In conjunction with a suitable decoder, two enhanced playback options are supported, the first option allowing full lossless reconstruction of a noise-shaped higher sampling rate signal, the second option allowing lossy bandwidth extension even if an intervening transmission chain has truncated the least-significant-bits of the encoder's output signal.

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# INTERNATIONAL SEARCH REPORT

International application No <b>PCT/GB2013/051548</b>
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A. CLASSIFICATION OF SUBJECT MATTER  
**INV. G10L19/00 G10L19/24**  
 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)  
**G10L**

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 practicable, search terms used)  
**EPO-Internal , WPI Data**

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	wo 2007/128662 AI (DEUT THOMSON-BRANDT GMBH) 15 November 2007 (2007-11-15) page 2, line 30 - page 4, line 2 ----- -/- .	1-26

Further documents are listed in the continuation of Box C.

See patent family annex.

- \* Special categories of cited documents :
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| <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> | <p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p> |
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Date of the actual completion of the international search <b>16 December 2013</b>	Date of mailing of the international search report <b>20/12/2013</b>
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  <b>Schneider, Daniel</b>
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## INTERNATIONAL SEARCH REPORT

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A	VEEN VAN DER M ET AL: "HIGH CAPACITY REVERSIBLE WATERMARKING FOR AUDIO" , PROCEEDINGS OF SPI E - INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING, S P I E - INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING, US, vol . 5020, 1 January 2003 (2003-01-01) , pages 1-11 , XP001189791 , ISSN: 0277-786X, DOI : 10. 1117/12 .476858 the whol e document -----	18-20

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