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(54) Title: METHOD AND APPARATUS FOR MINIMIZING NOISE ON A POWER SUPPLY LINE OF A MOBILE RADIO

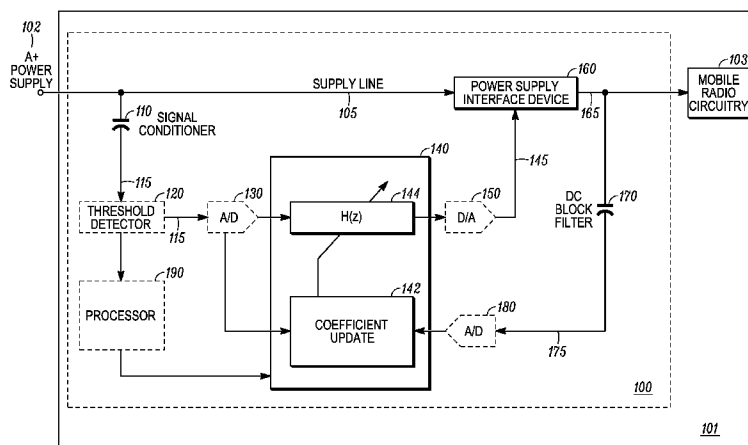


FIG. 1

(57) Abstract: An apparatus and method are provided for minimizing noise on a power supply line (105) of a mobile radio, such as generated in a vehicular environment. An adaptive power supply conditioner (100) detects unwanted noise on the vehicle's power supply line (105) and via the use of an adaptive noise canceller (140), generates a cancellation signal (145) having the same amplitude but opposite phase of the input signal's detected noise. The cancellation signal (145) is fed forward and combined with the power supply line (105) in order to minimize unwanted noise on the supply line (105) leading to the mobile radio. The conditioner's output (165) is checked for further error and is fed back to the adaptive noise filter (140) for further filtering and the generation of an updated cancellation signal based on current noise conditions.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/78718

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - H04B 1/10 (2008.01) USPC - 455/317 According to International Patent Classification (IPC) or to both national classification and IPC</p>														
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) USPC: 455/317</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC: 323/304; 370/317; (see terms below)</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWEST(PGPB,USPT,USOC,EPAB,JPAB), GOOGLE SCHOLAR terms: vehicle, car, automobile, mobile, power supply, battery, ripple, whine, noise, cancel, feedback, error, capacitor, DC block filter, alternater, opposite, phase, conditioning, regulator, inverse, threshold, pass transistor, driver, bias, adaptive filter, interface.</p>														
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X ----- Y</td> <td>US 5,043,686 A (PLUNKETT) 27 August 1991 (27.08.1991), entire document.</td> <td>1-5, 9, 11-13, 18-19, 21-25 ----- 6-8, 10, 14-17, 20</td> </tr> <tr> <td>Y</td> <td>US 5,995,567 A (CIOFFI et al.) 30 November 1999 (30.11.1999), fig. 5, col 7, ln 43-67 and col 11, ln 9-42.</td> <td>6-8, 10, 14-16, 20</td> </tr> <tr> <td>Y</td> <td>US 4,027,107 A (EILERS) 31 May 1977 (31.05.1977), fig. 12, col 16, ln 11-39 and col 22, ln 25-32.</td> <td>17</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X ----- Y	US 5,043,686 A (PLUNKETT) 27 August 1991 (27.08.1991), entire document.	1-5, 9, 11-13, 18-19, 21-25 ----- 6-8, 10, 14-17, 20	Y	US 5,995,567 A (CIOFFI et al.) 30 November 1999 (30.11.1999), fig. 5, col 7, ln 43-67 and col 11, ln 9-42.	6-8, 10, 14-16, 20	Y	US 4,027,107 A (EILERS) 31 May 1977 (31.05.1977), fig. 12, col 16, ln 11-39 and col 22, ln 25-32.	17
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<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td style="vertical-align: top;"> <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> </td> <td style="vertical-align: top;"> <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>“&” document member of the same patent family</p> </td> </tr> </table>			<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>“&” document member of the same patent family</p>										
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<p>Date of the actual completion of the international search</p> <p>11 February 2008 (11.02.2008)</p>		<p>Date of mailing of the international search report</p> <p>17 APR 2008</p>												
<p>Name and mailing address of the ISA/US</p> <p>Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201</p>		<p>Authorized officer:</p> <p>Lee W. Young</p> <p>PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774</p>												

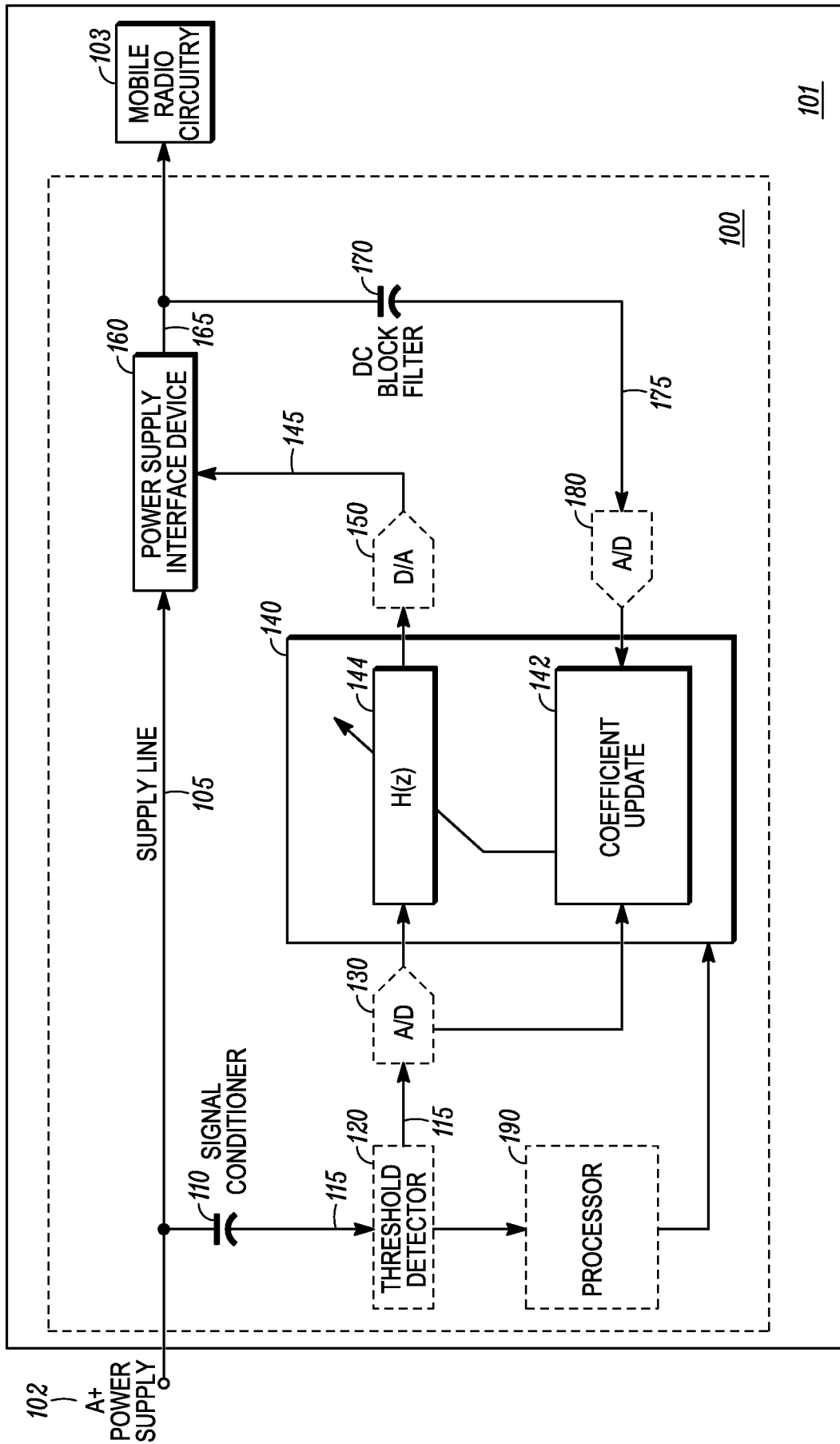


FIG. 1