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Gan et al.

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(54) **APPROACH FOR SELECTING COMMUNICATIONS CHANNELS BASED ON PERFORMANCE**

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H04Q 7/00 (2006.01)

(52) **U.S. Cl.** **370/329**; 375/132; 455/450

(58) **Field of Classification Search** 370/328–334, 370/431, 436, 437, 464, 465; 375/132–136; 450/450, 451, 452.1, 452.2
See application file for complete search history.

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(57) **ABSTRACT**

An approach for selecting sets of communications channels involves determining the performance of communications channels. A set of channels is selected based on the results of performance testing and specified criteria. The participant generates data that identifies the selected set of channels and provides that data to other participants of the communications network. The participants communicate over the set of channels, such as by using a frequency hopping protocol. When a specified time expires or monitoring of the performance of the channel set identifies poor performance of the set of channels, the participant selects another set of channels for use in communications based on additional performance testing. By selecting channels based on the initial performance testing and performance monitoring, the communications network adaptively avoids channels with poor performance.

128 Claims, 11 Drawing Sheets
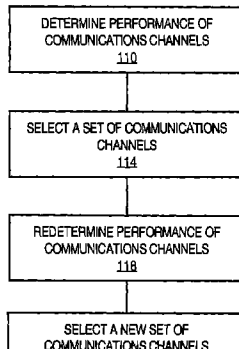
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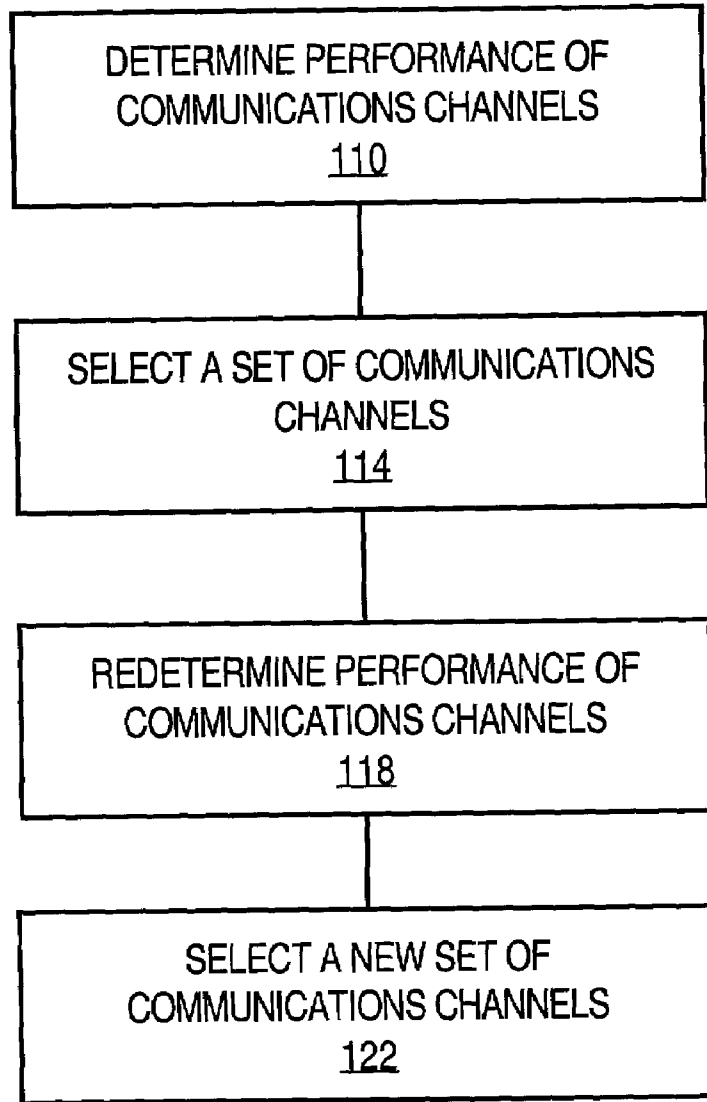
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100

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┌─────────────────────────────────┐
│   DETERMINE PERFORMANCE OF       │
│   COMMUNICATIONS CHANNELS        │
│            110                   │
└─────────────────────────────────┘
                │
┌─────────────────────────────────┐
│  SELECT A SET OF COMMUNICATIONS  │
│            CHANNELS              │
│            114                   │
└─────────────────────────────────┘
                │
┌─────────────────────────────────┐
│  REDETERMINE PERFORMANCE OF      │
│   COMMUNICATIONS CHANNELS        │
│            118                   │
└─────────────────────────────────┘
                │
┌─────────────────────────────────┐
│   SELECT A NEW SET OF            │
│  COMMUNICATIONS CHANNELS         │
│            122                   │
└─────────────────────────────────┘
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FIG. 1A

DETERMINE PERFORMANCE DATA OF COMMUNICATIONS CHANNELS   <u>130</u>

SELECT A SET OF COMMUNICATIONS CHANNELS   <u>132</u>

GENERATE CHANNEL IDENTIFICATION DATA THAT IDENTIFIES THE SET OF COMMUNICATIONS CHANNELS   <u>134</u>

PROVIDE THE CHANNEL IDENTIFICATION DATA TO THE PARTICIPANT   <u>136</u>

COMMUNICATE WITH THE PARTICIPANT OVER THE SET OF COMMUNICATIONS CHANNELS   <u>138</u>

REDETERMINE THE PERFORMANCE OF THE COMMUNICATIONS CHANNELS   <u>140</u>

SELECT A NEW SET OF COMMUNICATIONS CHANNELS   <u>142</u>

GENERATE NEW DATA THAT IDENTIFIES THE NEW SET OF COMMUNICATIONS CHANNELS   <u>144</u>

PROVIDE THE NEW IDENTIFICATION DATA TO THE PARTICIPANT   <u>146</u>

COMMUNICATE WITH THE PARTICIPANT OVER THE NEW SET OF COMMUNICATIONS CHANNELS   <u>148</u>

FIG. 1B

COMMUNICATIONS NETWORK 200

MASTER 210

MEMORY

212

PROCESSOR

214

TRANSCEIVER   216

SLAVE 220

MEMORY

222

PROCESSOR

224

TRANSCEIVER

226

SLAVE 230

MEMORY
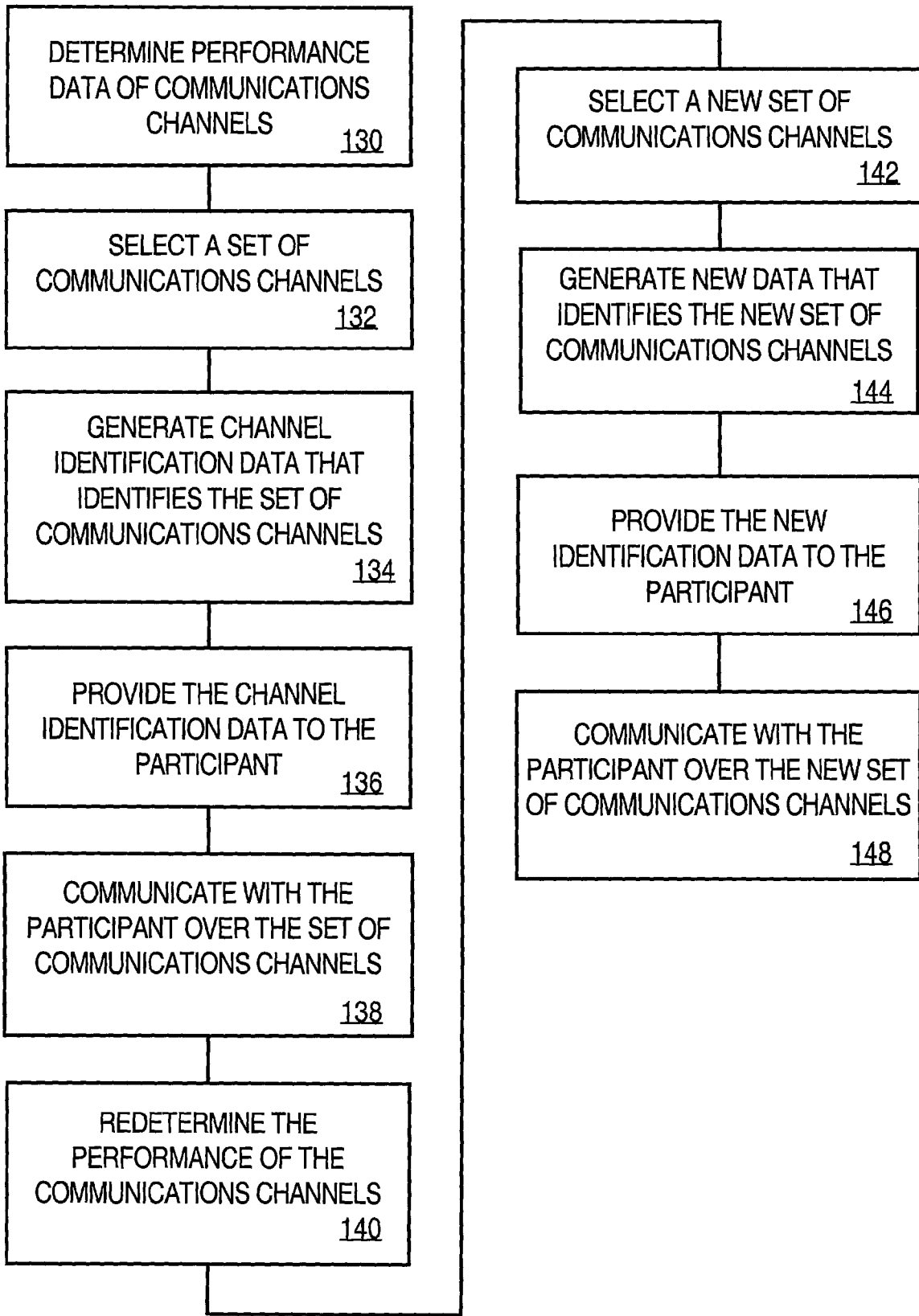
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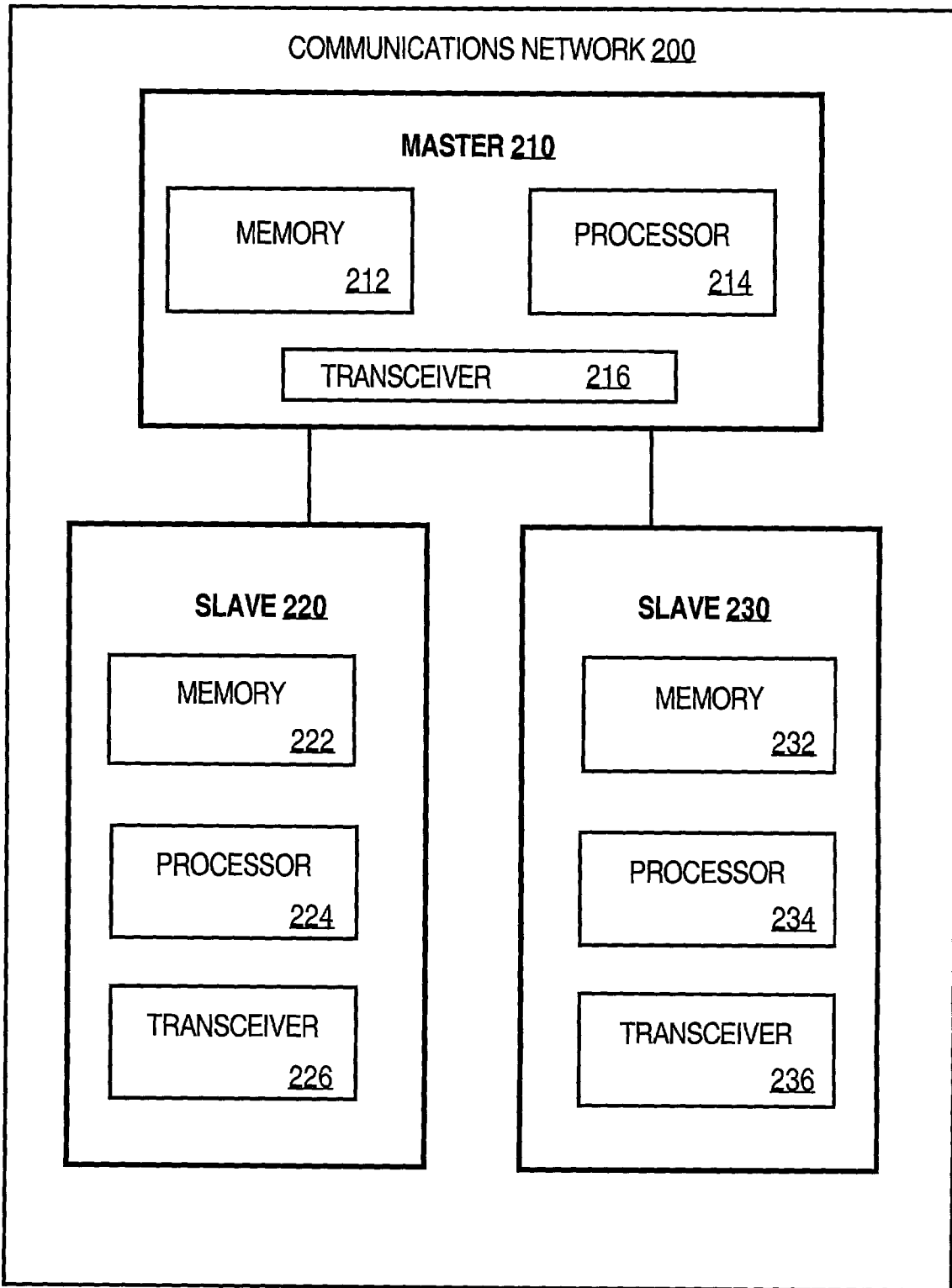
PROCESSOR

234

TRANSCEIVER

236

FIG. 2

DOCKET ALARM

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