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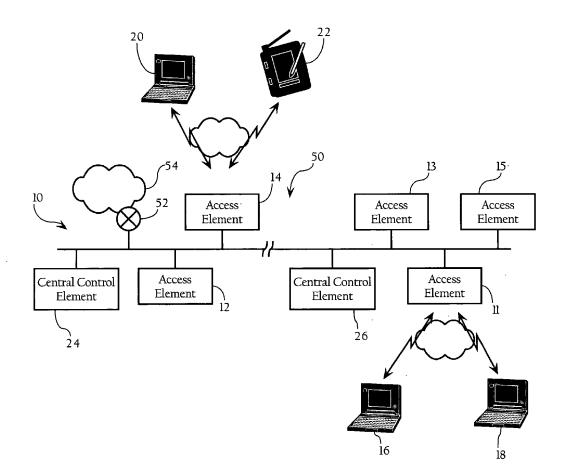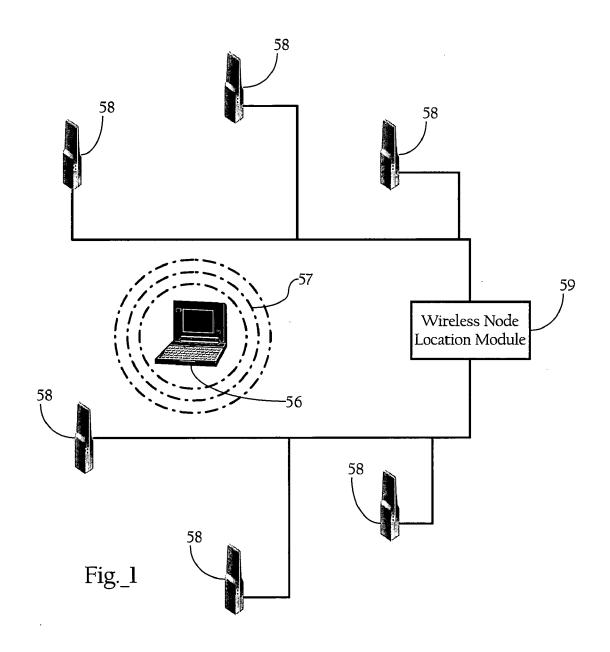**38 FOUNTAIN ST.**
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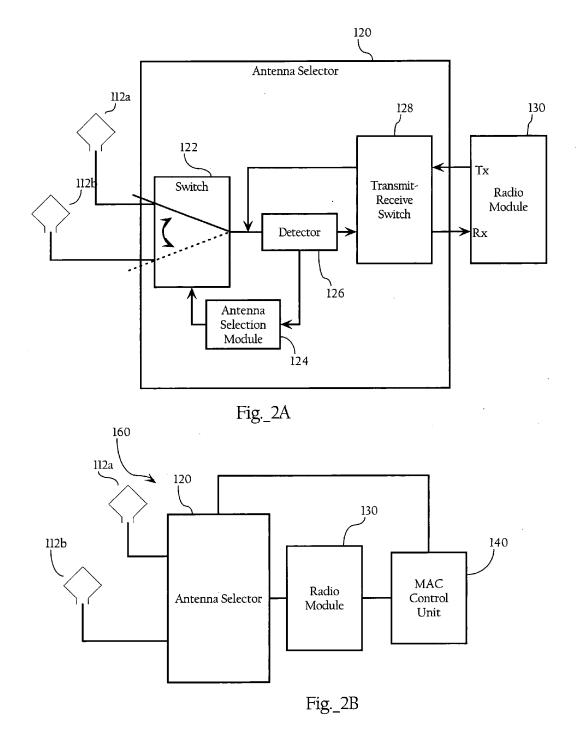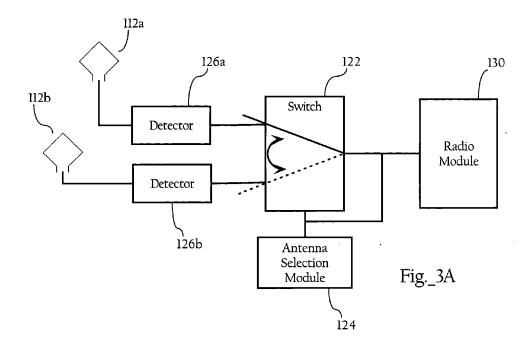
(57) **ABSTRACT**

A wireless node RF Fingerprinting location mechanism that uses multiple antenna patterns to enhance the accuracy of wireless node location in an RF environment. In one implementation, substantially non-overlapping antenna pattern diversity is used to provide a degree of sectorization in computing the estimated location of a wireless node.

Fig._1

120

Antenna Selector

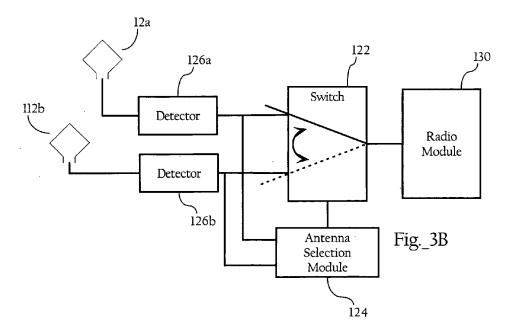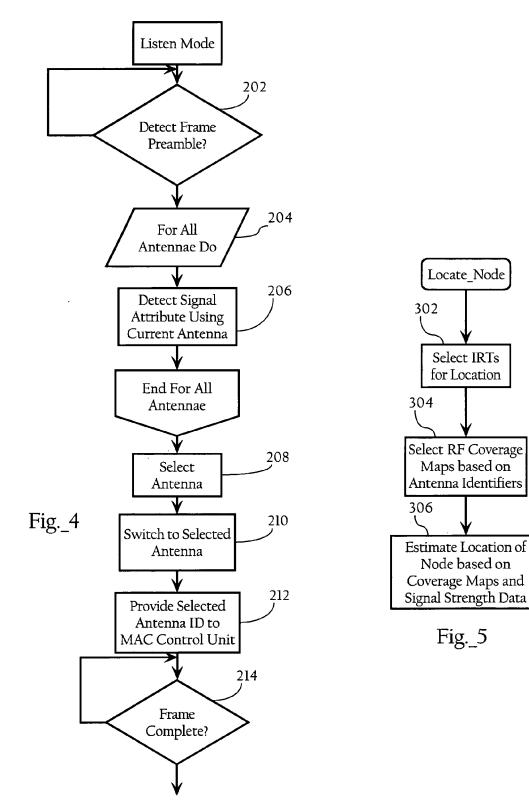112a

122

128

130

Switch

112b

Detector

Transmit-
Receive
Switch

Tx

Radio
Module

Rx

126

Antenna
Selection
Module

124

Fig._2A

160

112a

120

130

112b

140

Antenna Selector

Radio
Module

MAC
Control
Unit

Fig._2B

Fig._3A

Fig._3B

Listen Mode

Detect Frame
Preamble?   202

For All
Antennae Do   204

Detect Signal
Attribute Using   206
Current Antenna

End For All
Antennae

Select   208
Antenna

Fig._4

Switch to Selected   210
Antenna

Provide Selected   212
Antenna ID to
MAC Control Unit

Frame   214
Complete?

Locate_Node

302

Select IRTs
for Location

304

Select RF Coverage
Maps based on
Antenna Identifiers

306

Estimate Location of
Node based on
Coverage Maps and
Signal Strength Data

Fig._5

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