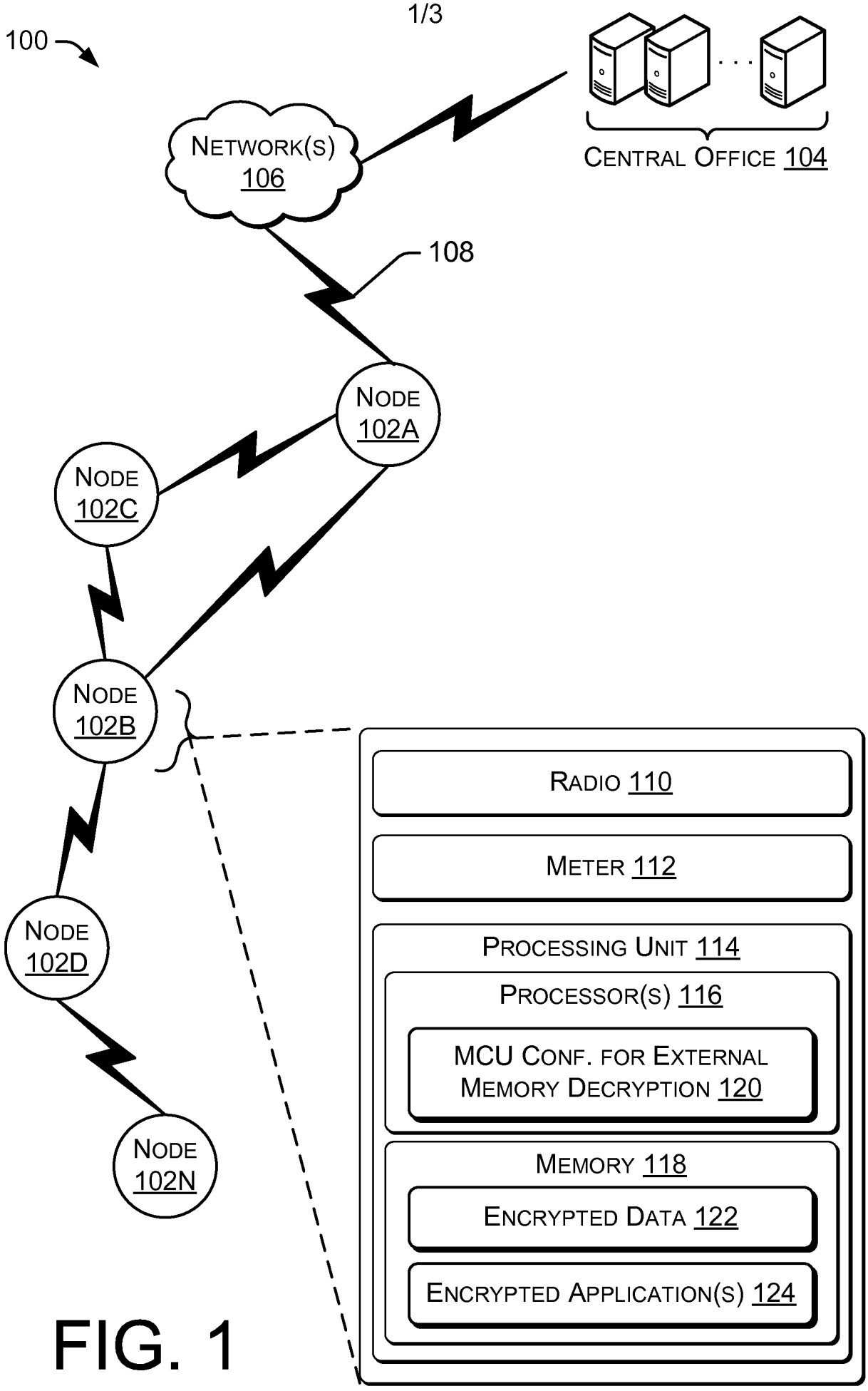
100
NETWORK(S) 106
CENTRAL OFFICE 104
108
NODE 102A
NODE 102C
NODE 102B
NODE 102D
NODE 102N
RADIO 110
METER 112
PROCESSING UNIT 114
PROCESSOR(S) 116
MCU CONF. FOR EXTERNAL MEMORY DECRYPTION 120
MEMORY 118
ENCRYPTED DATA 122
ENCRYPTED APPLICATION(S) 124

FIG. 1

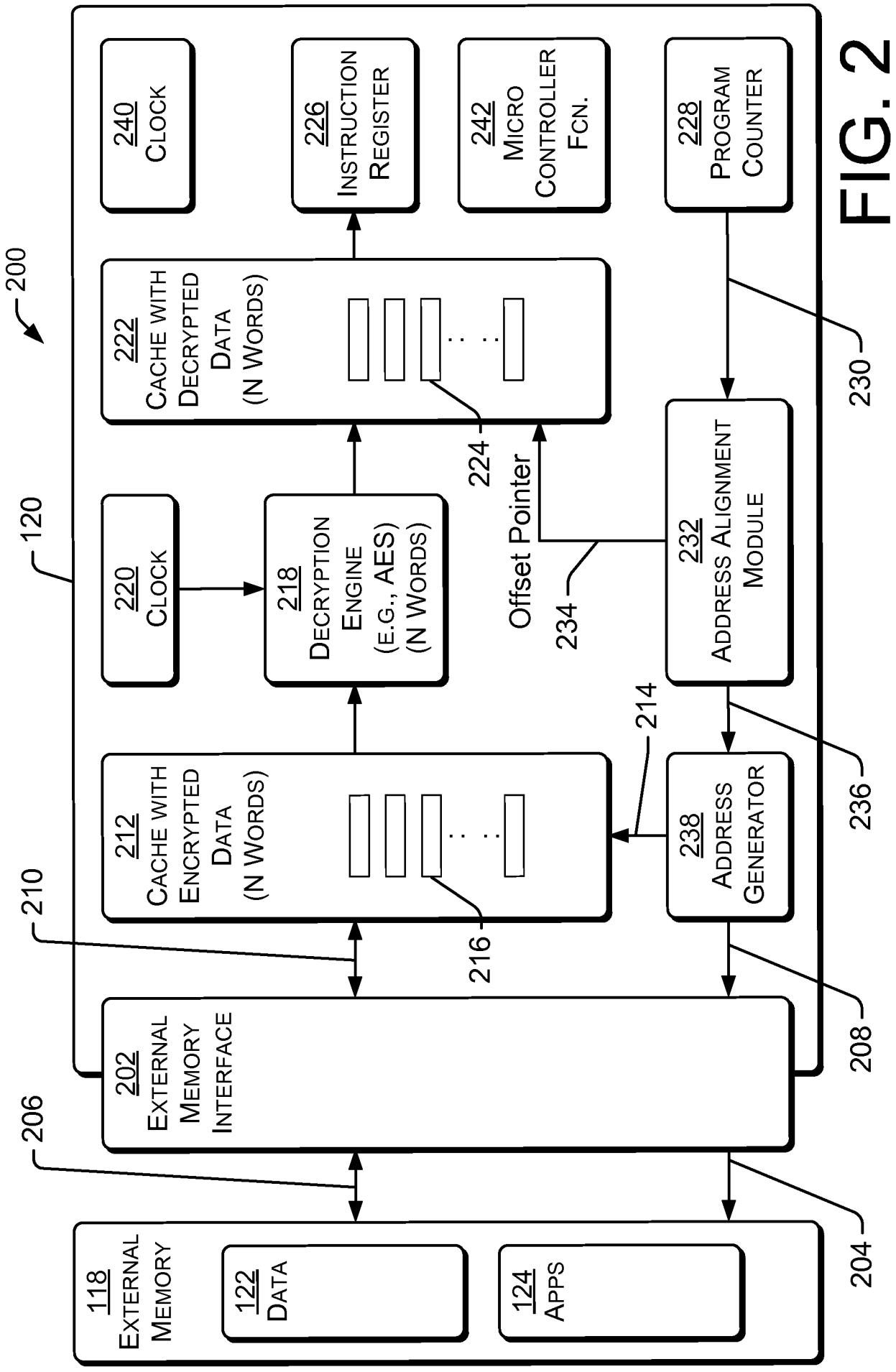
200
120
210
206
118 External Memory
122 Data
124 Apps
202 External Memory Interface
204
208
212 Cache with Encrypted Data (N Words)
216
214
238 Address Generator
236
220 Clock
218 Decryption Engine (e.g., AES) (N Words)
222 Cache with Decrypted Data (N Words)
224
Offset Pointer
234
232 Address Alignment Module
230
240 Clock
226 Instruction Register
242 Micro Controller Fcn.
228 Program Counter

FIG. 2

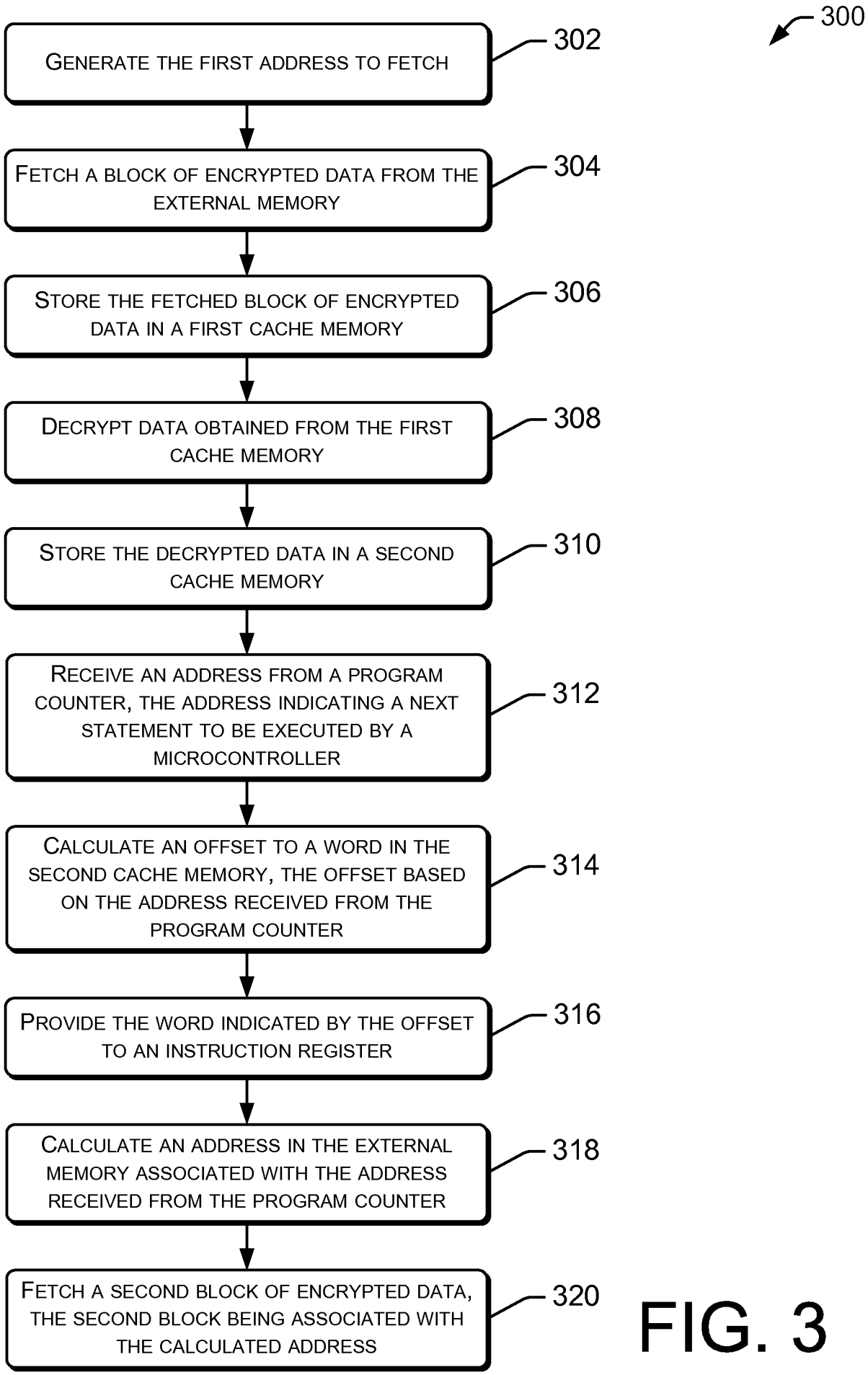
300
GENERATE THE FIRST ADDRESS TO FETCH
302
FETCH A BLOCK OF ENCRYPTED DATA FROM THE EXTERNAL MEMORY
304
STORE THE FETCHED BLOCK OF ENCRYPTED DATA IN A FIRST CACHE MEMORY
306
DECRYPT DATA OBTAINED FROM THE FIRST CACHE MEMORY
308
STORE THE DECRYPTED DATA IN A SECOND CACHE MEMORY
310
RECEIVE AN ADDRESS FROM A PROGRAM COUNTER, THE ADDRESS INDICATING A NEXT STATEMENT TO BE EXECUTED BY A MICROCONTROLLER
312
CALCULATE AN OFFSET TO A WORD IN THE SECOND CACHE MEMORY, THE OFFSET BASED ON THE ADDRESS RECEIVED FROM THE PROGRAM COUNTER
314
PROVIDE THE WORD INDICATED BY THE OFFSET TO AN INSTRUCTION REGISTER
316
CALCULATE AN ADDRESS IN THE EXTERNAL MEMORY ASSOCIATED WITH THE ADDRESS RECEIVED FROM THE PROGRAM COUNTER
318
FETCH A SECOND BLOCK OF ENCRYPTED DATA, THE SECOND BLOCK BEING ASSOCIATED WITH THE CALCULATED ADDRESS
320

FIG. 3