Fig. 1

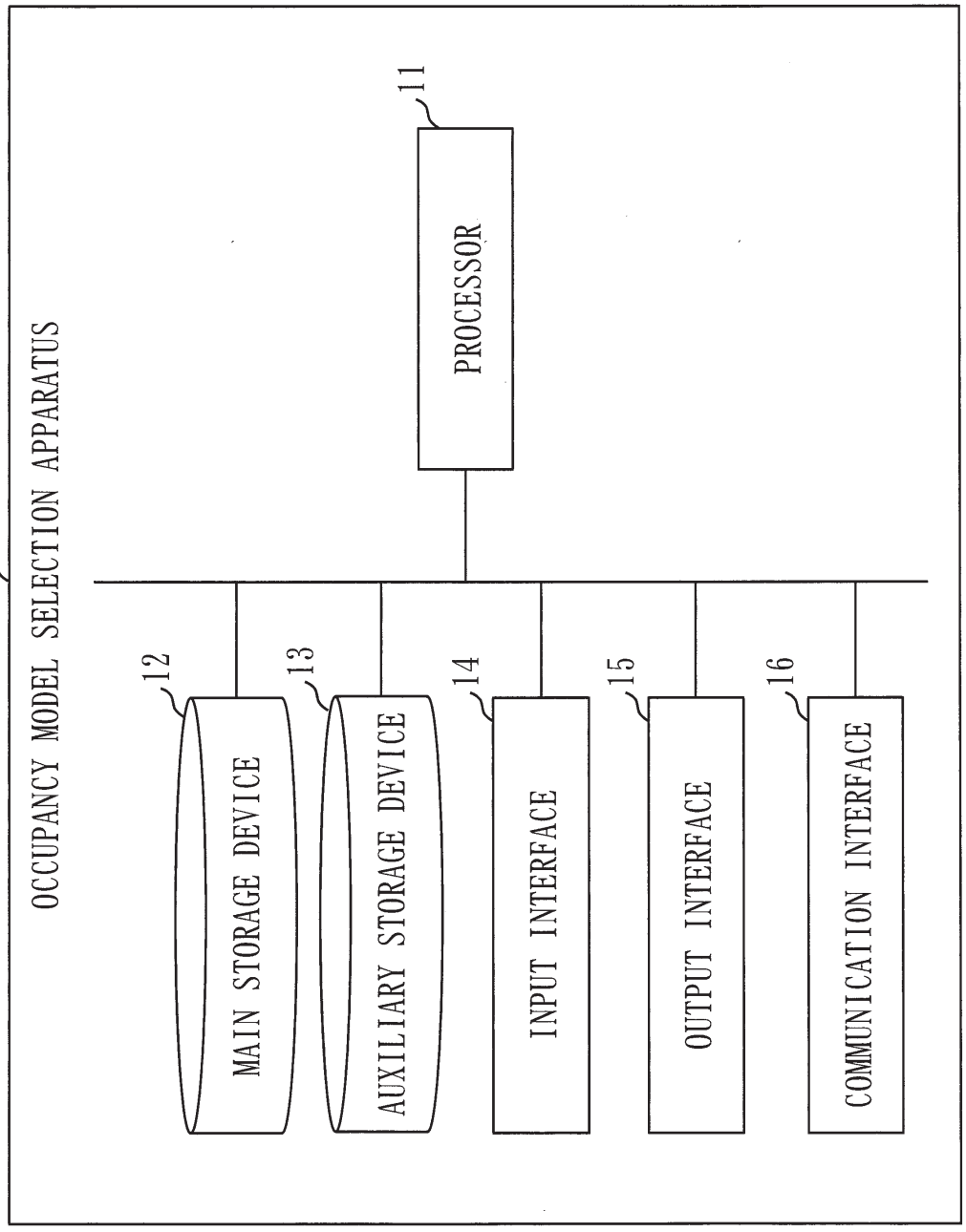

100
OCCUPANCY MODEL SELECTION APPARATUS
11
PROCESSOR
12
MAIN STORAGE DEVICE
13
AUXILIARY STORAGE DEVICE
14
INPUT INTERFACE
15
OUTPUT INTERFACE
16
COMMUNICATION INTERFACE

Fig. 2

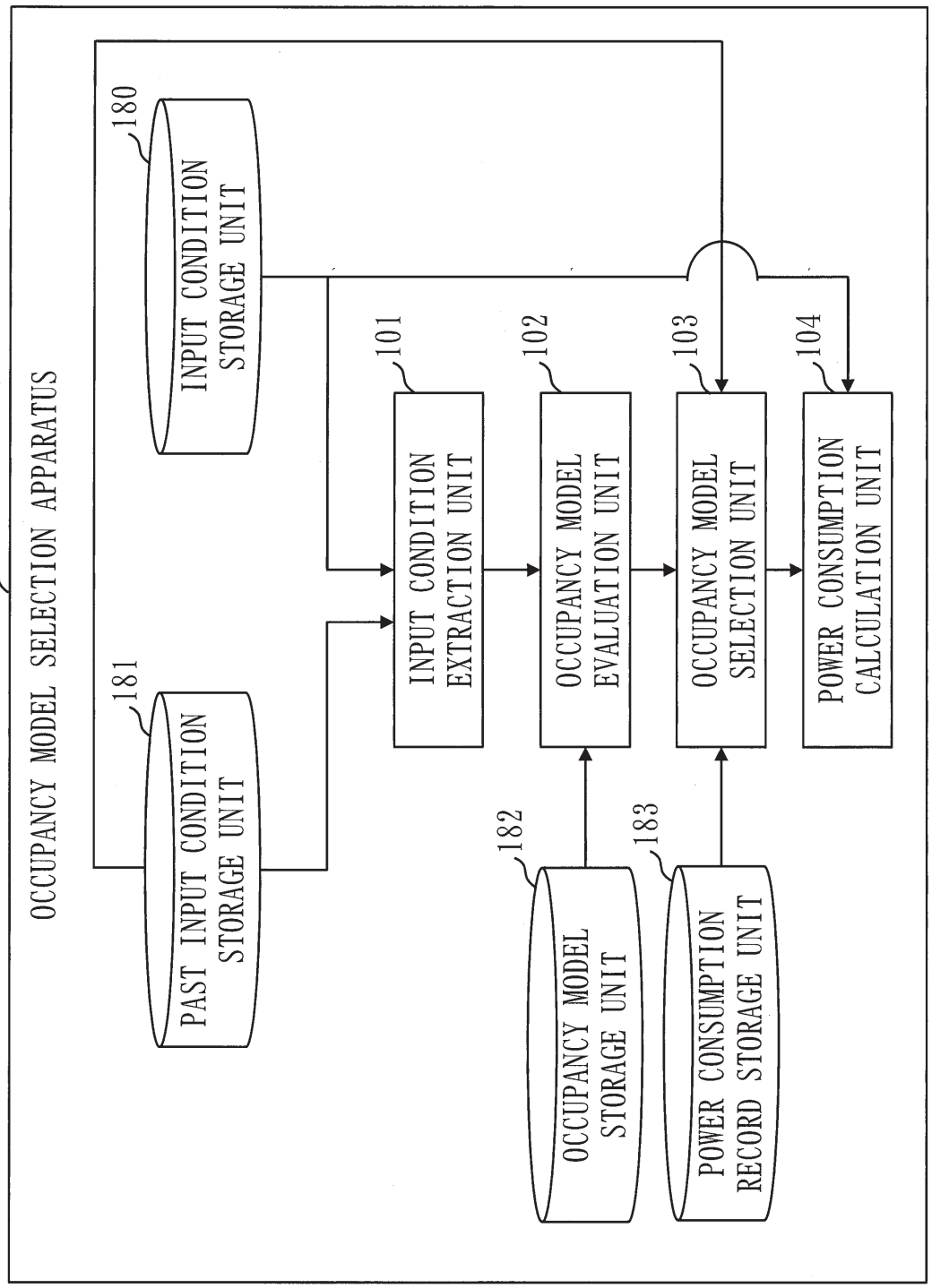

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
101
INPUT CONDITION EXTRACTION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
182
OCCUPANCY MODEL STORAGE UNIT
183
POWER CONSUMPTION RECORD STORAGE UNIT

Fig. 3

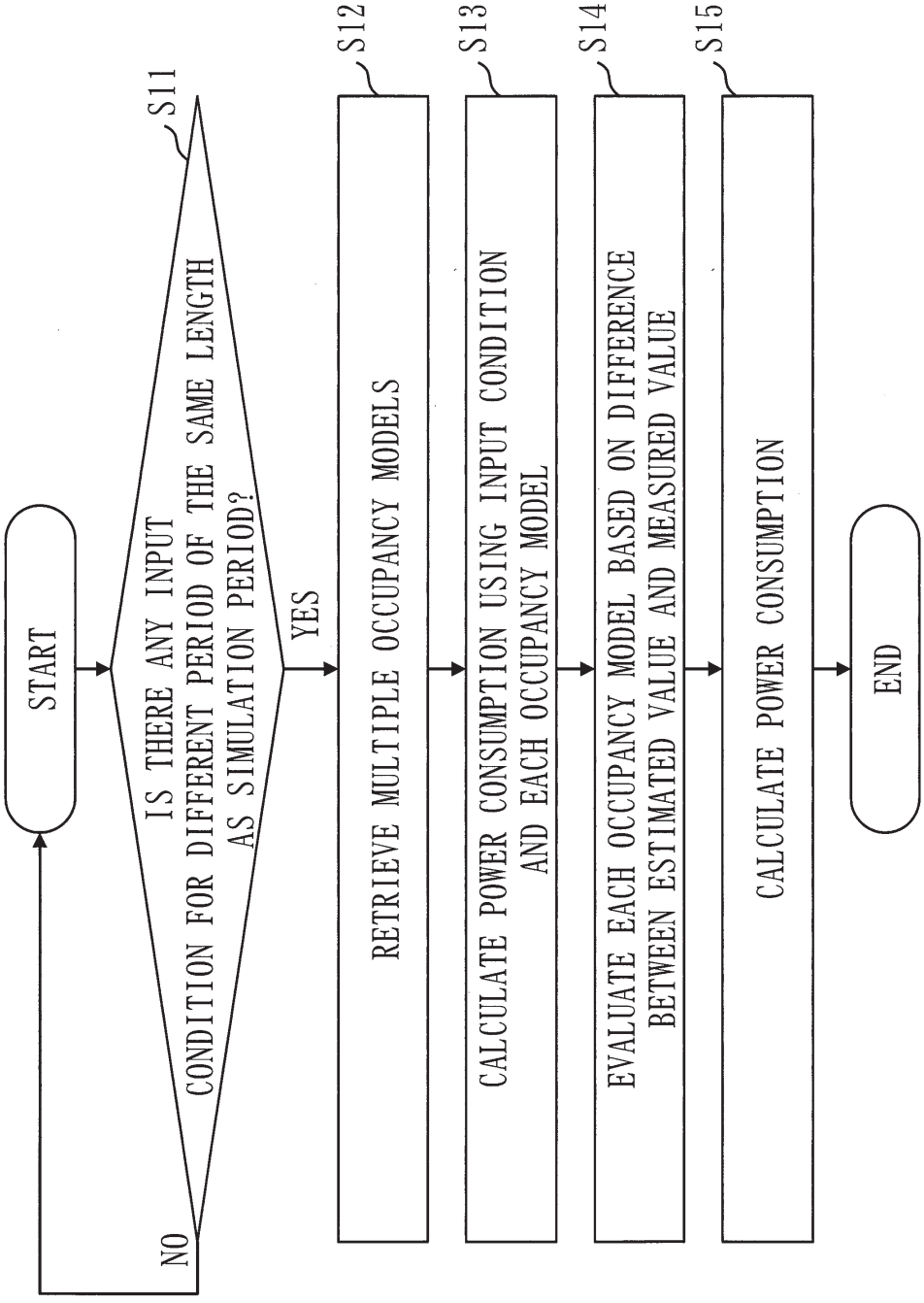

START
S11
IS THERE ANY INPUT CONDITION FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
NO
YES
S12
RETRIEVE MULTIPLE OCCUPANCY MODELS
S13
CALCULATE POWER CONSUMPTION USING INPUT CONDITION AND EACH OCCUPANCY MODEL
S14
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S15
CALCULATE POWER CONSUMPTION
END

Fig. 4

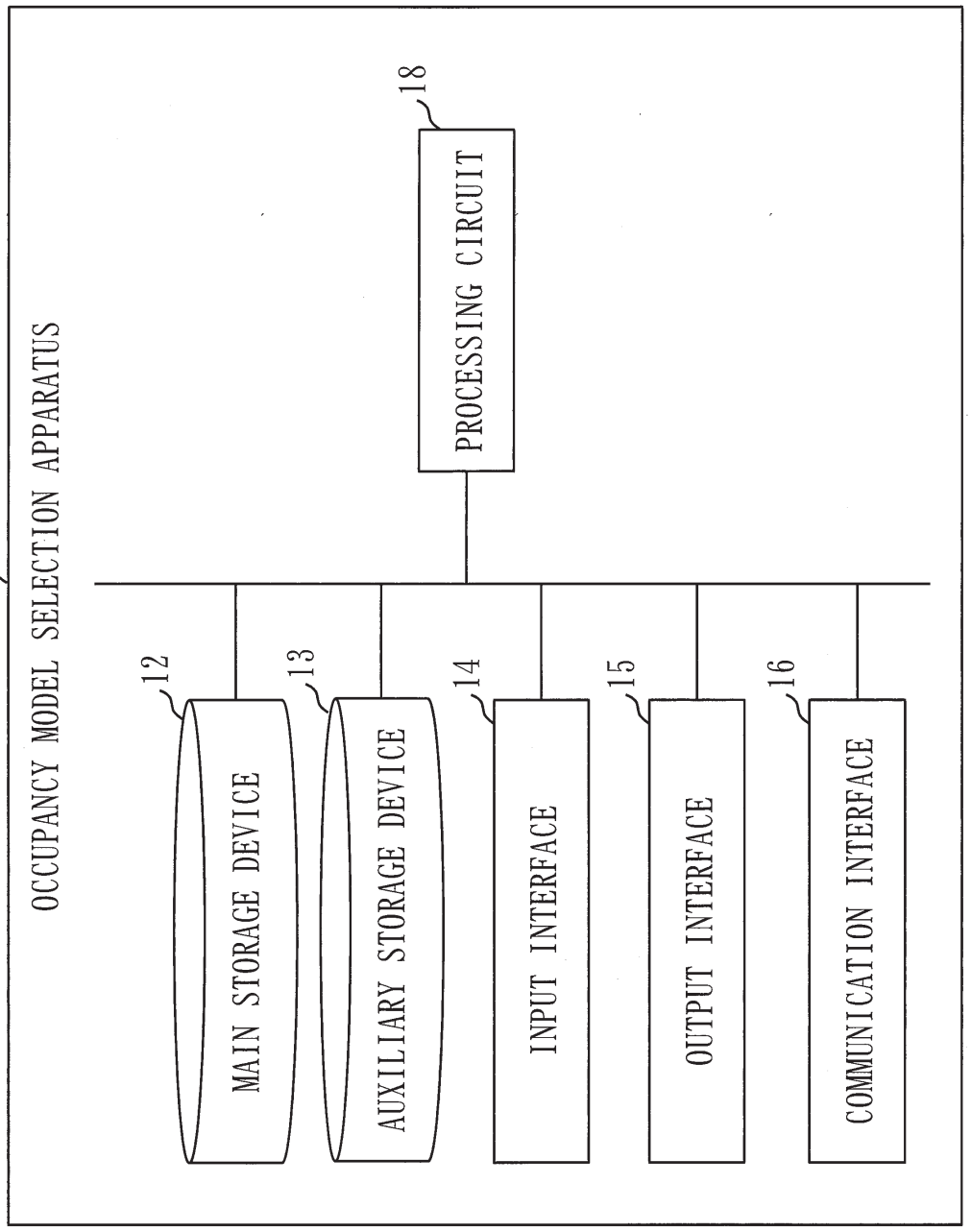

100
OCCUPANCY MODEL SELECTION APPARATUS
18
PROCESSING CIRCUIT
12
MAIN STORAGE DEVICE
13
AUXILIARY STORAGE DEVICE
14
INPUT INTERFACE
15
OUTPUT INTERFACE
16
COMMUNICATION INTERFACE

Fig. 5

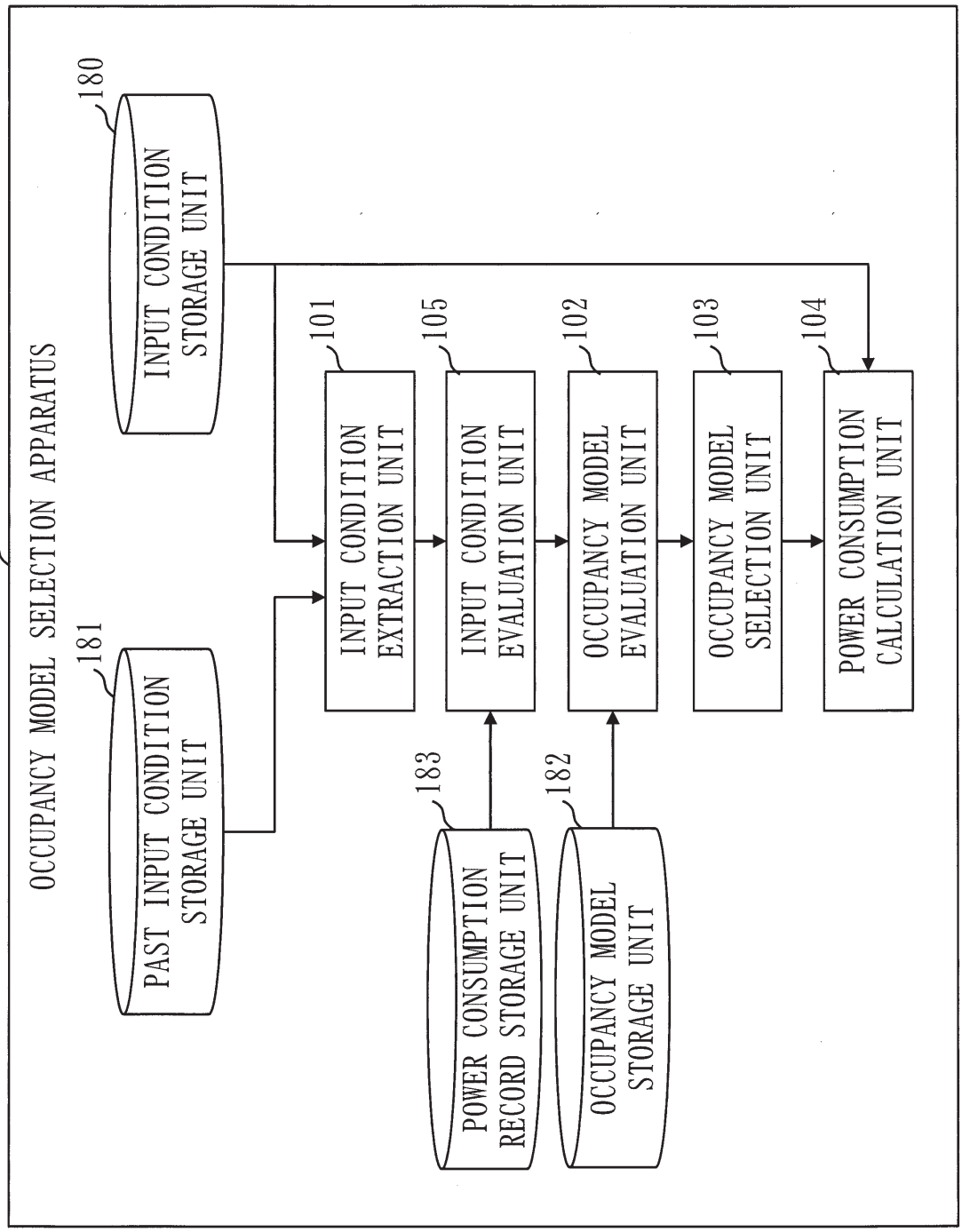

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
101
INPUT CONDITION EXTRACTION UNIT
105
INPUT CONDITION EVALUATION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
183
POWER CONSUMPTION RECORD STORAGE UNIT
182
OCCUPANCY MODEL STORAGE UNIT

Fig. 6

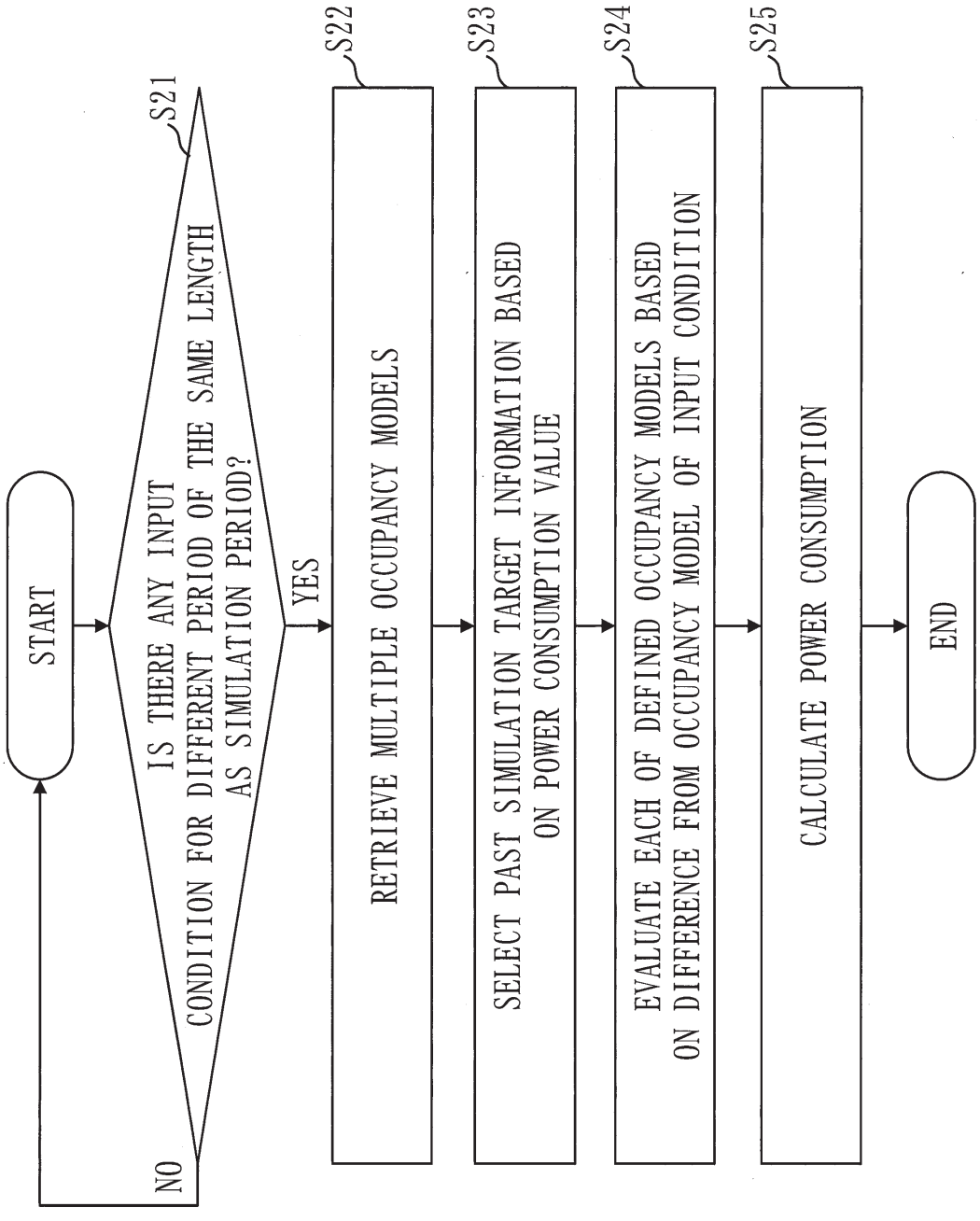

START
S21
IS THERE ANY INPUT CONDITION FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
NO
YES
S22
RETRIEVE MULTIPLE OCCUPANCY MODELS
S23
SELECT PAST SIMULATION TARGET INFORMATION BASED ON POWER CONSUMPTION VALUE
S24
EVALUATE EACH OF DEFINED OCCUPANCY MODELS BASED ON DIFFERENCE FROM OCCUPANCY MODEL OF INPUT CONDITION
S25
CALCULATE POWER CONSUMPTION
END

Fig. 7

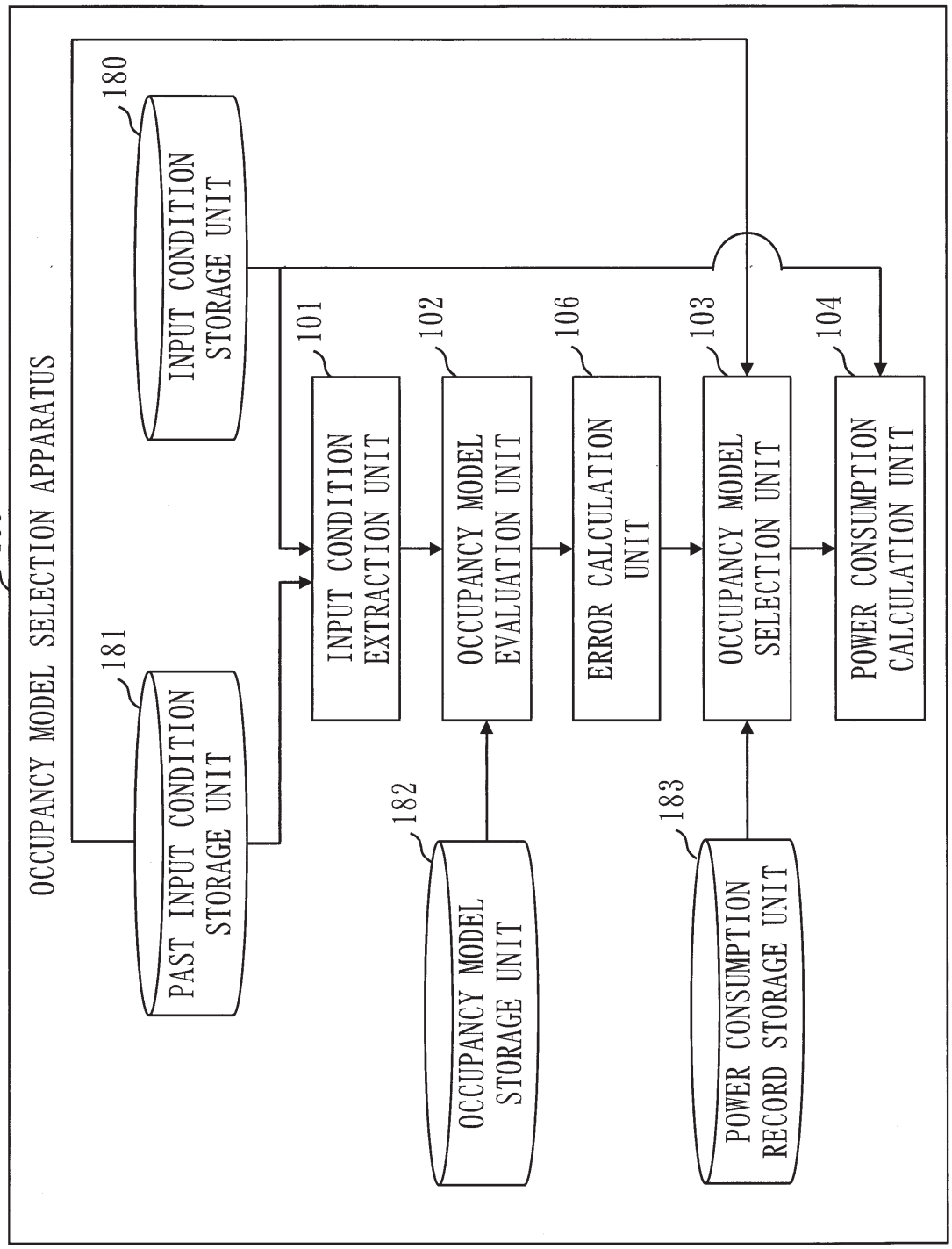

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
101
INPUT CONDITION EXTRACTION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
106
ERROR CALCULATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
182
OCCUPANCY MODEL STORAGE UNIT
183
POWER CONSUMPTION RECORD STORAGE UNIT

Fig. 8

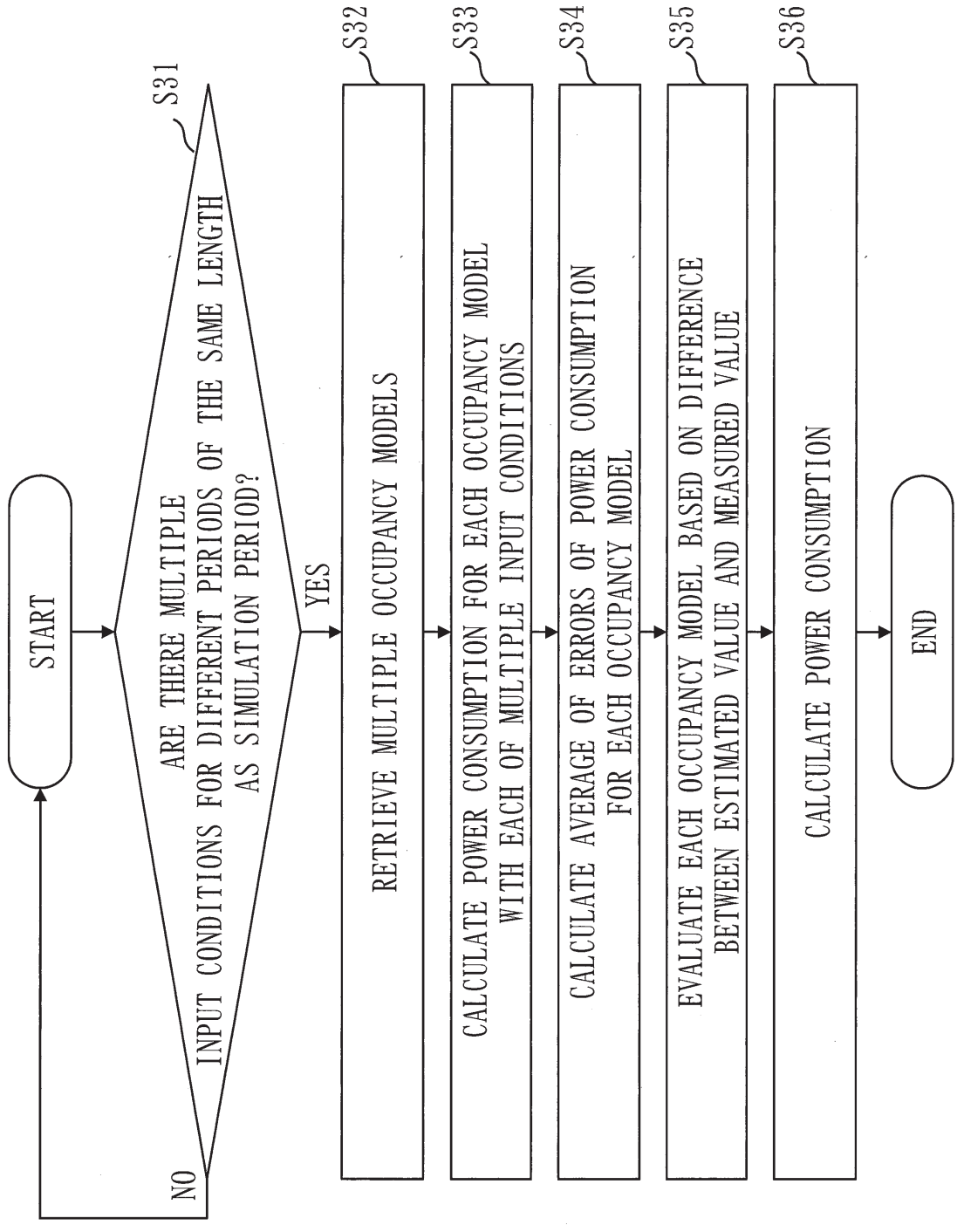

START
S31
ARE THERE MULTIPLE INPUT CONDITIONS FOR DIFFERENT PERIODS OF THE SAME LENGTH AS SIMULATION PERIOD?
NO
YES
S32
RETRIEVE MULTIPLE OCCUPANCY MODELS
S33
CALCULATE POWER CONSUMPTION FOR EACH OCCUPANCY MODEL WITH EACH OF MULTIPLE INPUT CONDITIONS
S34
CALCULATE AVERAGE OF ERRORS OF POWER CONSUMPTION FOR EACH OCCUPANCY MODEL
S35
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S36
CALCULATE POWER CONSUMPTION
END

Fig. 9

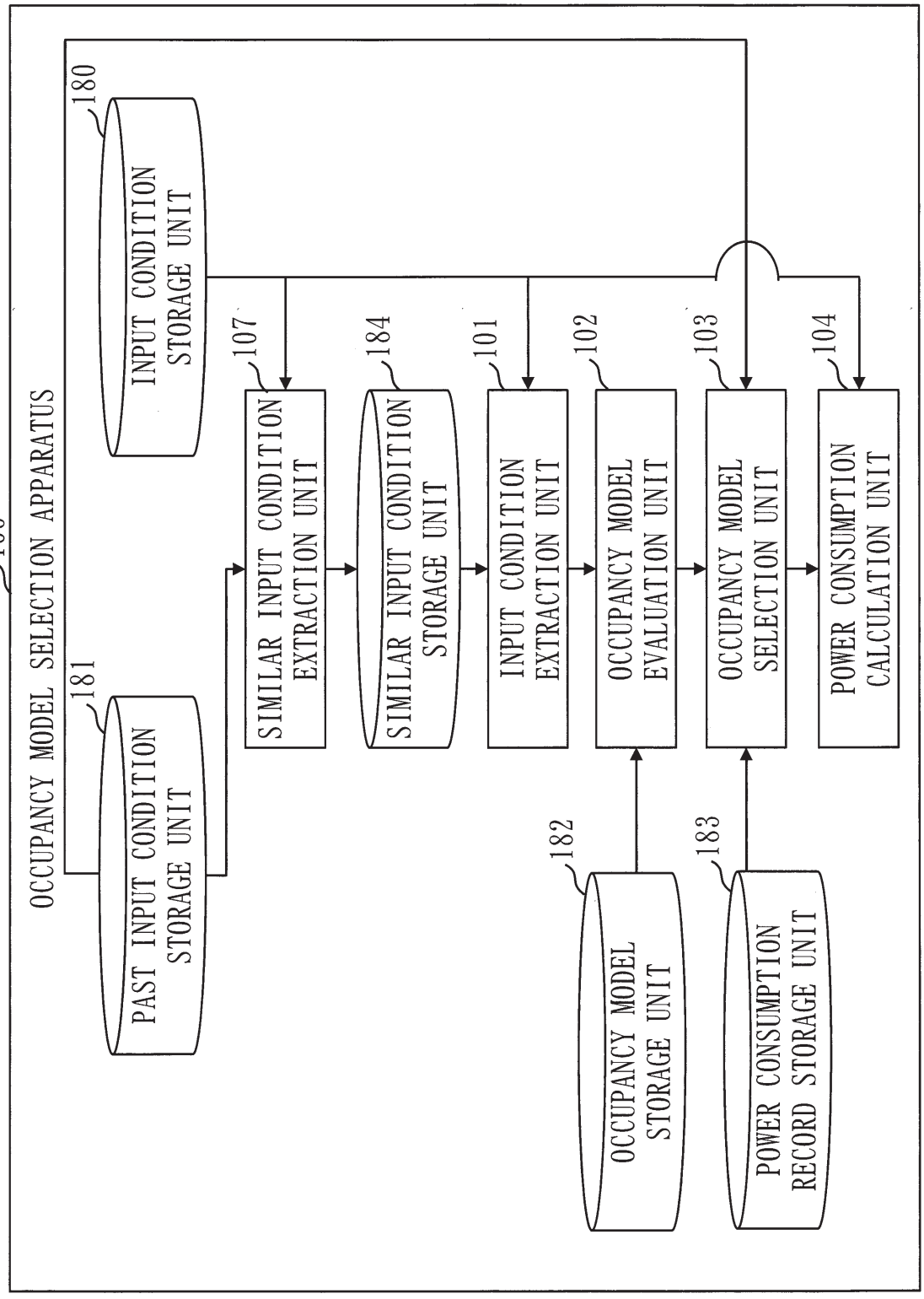

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
107
SIMILAR INPUT CONDITION EXTRACTION UNIT
184
SIMILAR INPUT CONDITION STORAGE UNIT
101
INPUT CONDITION EXTRACTION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
182
OCCUPANCY MODEL STORAGE UNIT
183
POWER CONSUMPTION RECORD STORAGE UNIT

Fig. 10

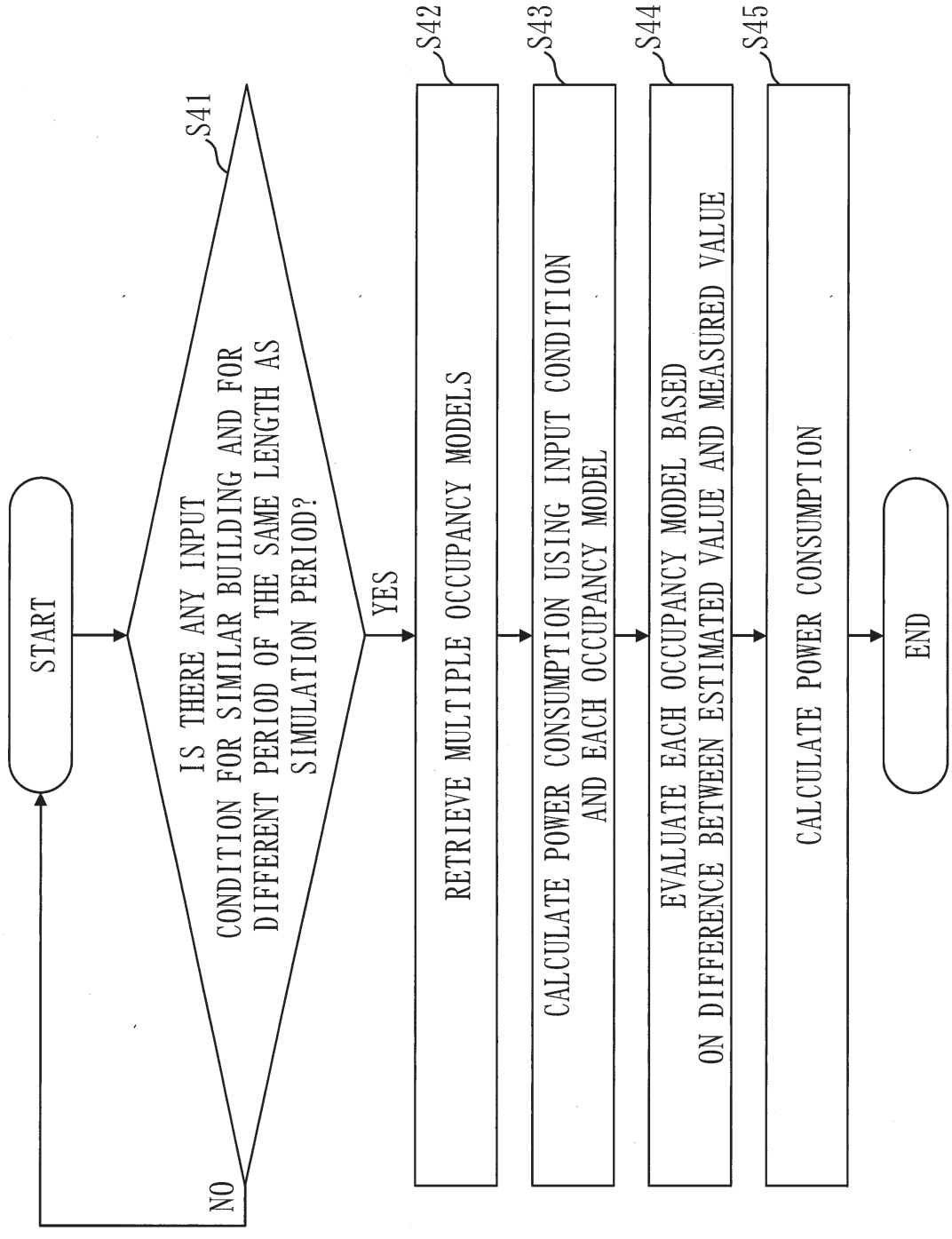

START
S41
IS THERE ANY INPUT CONDITION FOR SIMILAR BUILDING AND FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
NO
YES
S42
RETRIEVE MULTIPLE OCCUPANCY MODELS
S43
CALCULATE POWER CONSUMPTION USING INPUT CONDITION AND EACH OCCUPANCY MODEL
S44
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S45
CALCULATE POWER CONSUMPTION
END

Fig. 11

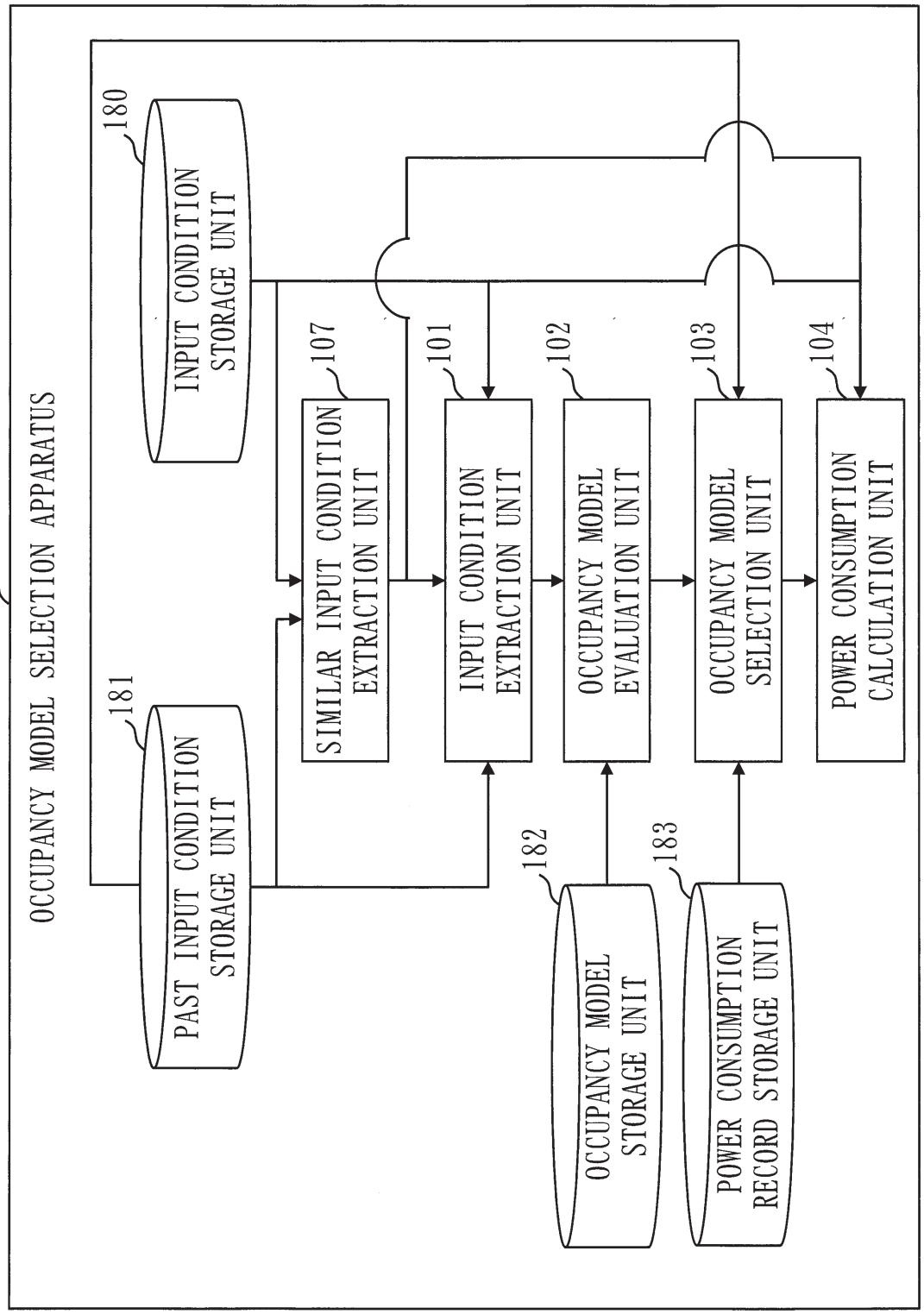

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
107
SIMILAR INPUT CONDITION EXTRACTION UNIT
101
INPUT CONDITION EXTRACTION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
182
OCCUPANCY MODEL STORAGE UNIT
183
POWER CONSUMPTION RECORD STORAGE UNIT

Fig. 12

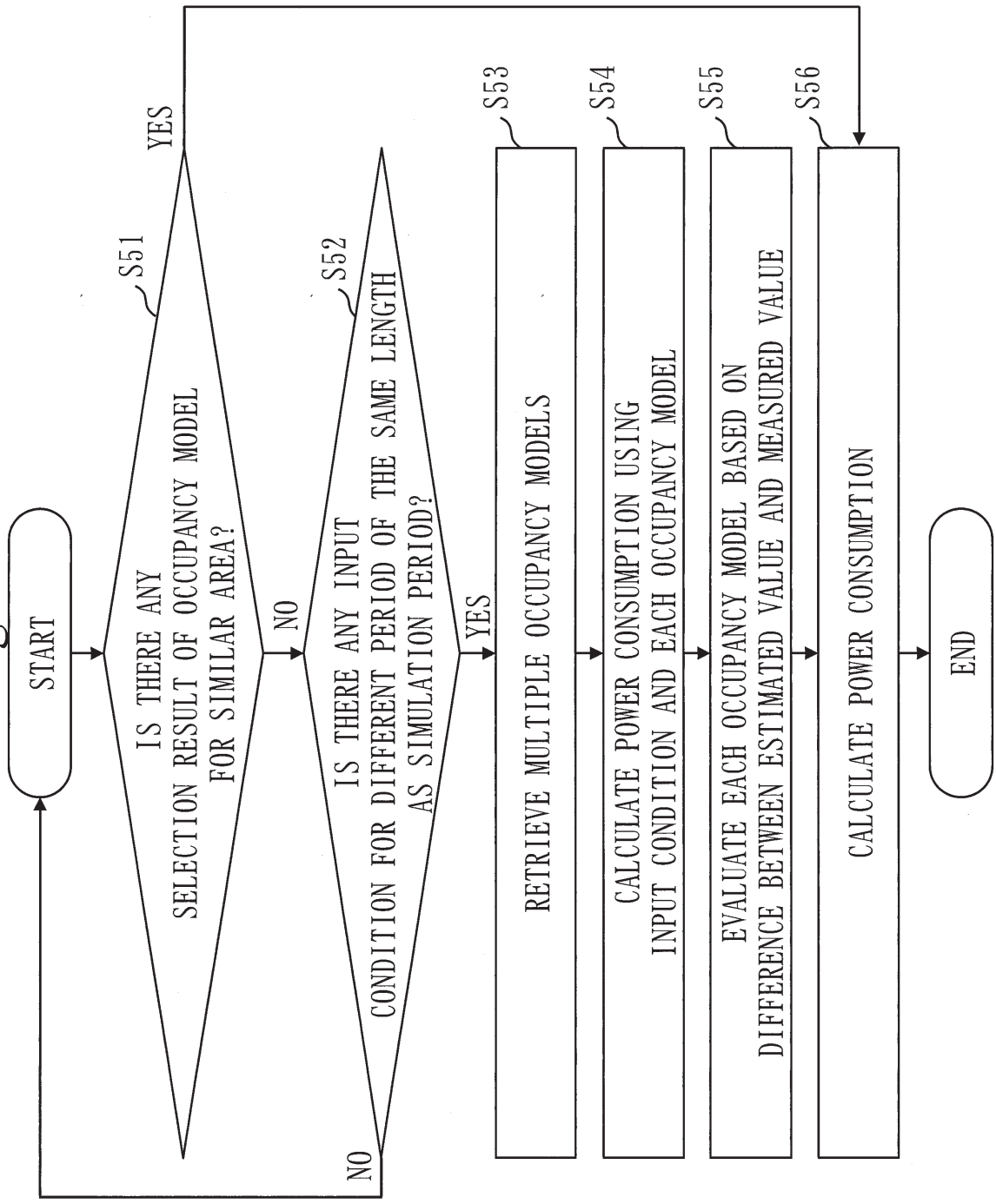

START
S51
IS THERE ANY SELECTION RESULT OF OCCUPANCY MODEL FOR SIMILAR AREA?
YES
NO
S52
IS THERE ANY INPUT CONDITION FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
YES
NO
S53
RETRIEVE MULTIPLE OCCUPANCY MODELS
S54
CALCULATE POWER CONSUMPTION USING INPUT CONDITION AND EACH OCCUPANCY MODEL
S55
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S56
CALCULATE POWER CONSUMPTION
END

Fig. 13

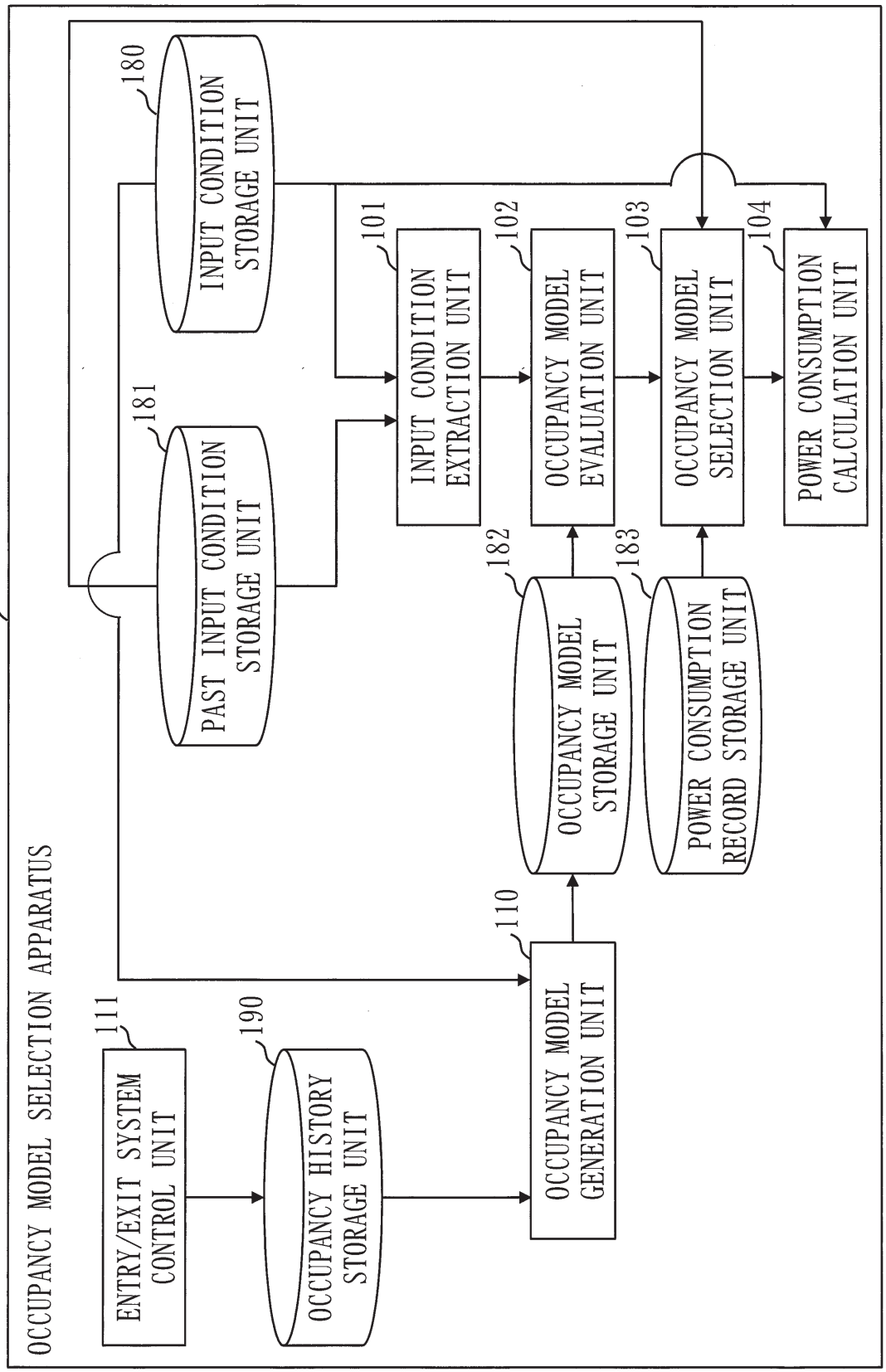

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
101
INPUT CONDITION EXTRACTION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
182
OCCUPANCY MODEL STORAGE UNIT
183
POWER CONSUMPTION RECORD STORAGE UNIT
110
OCCUPANCY MODEL GENERATION UNIT
111
ENTRY/EXIT SYSTEM CONTROL UNIT
190
OCCUPANCY HISTORY STORAGE UNIT

Fig. 14

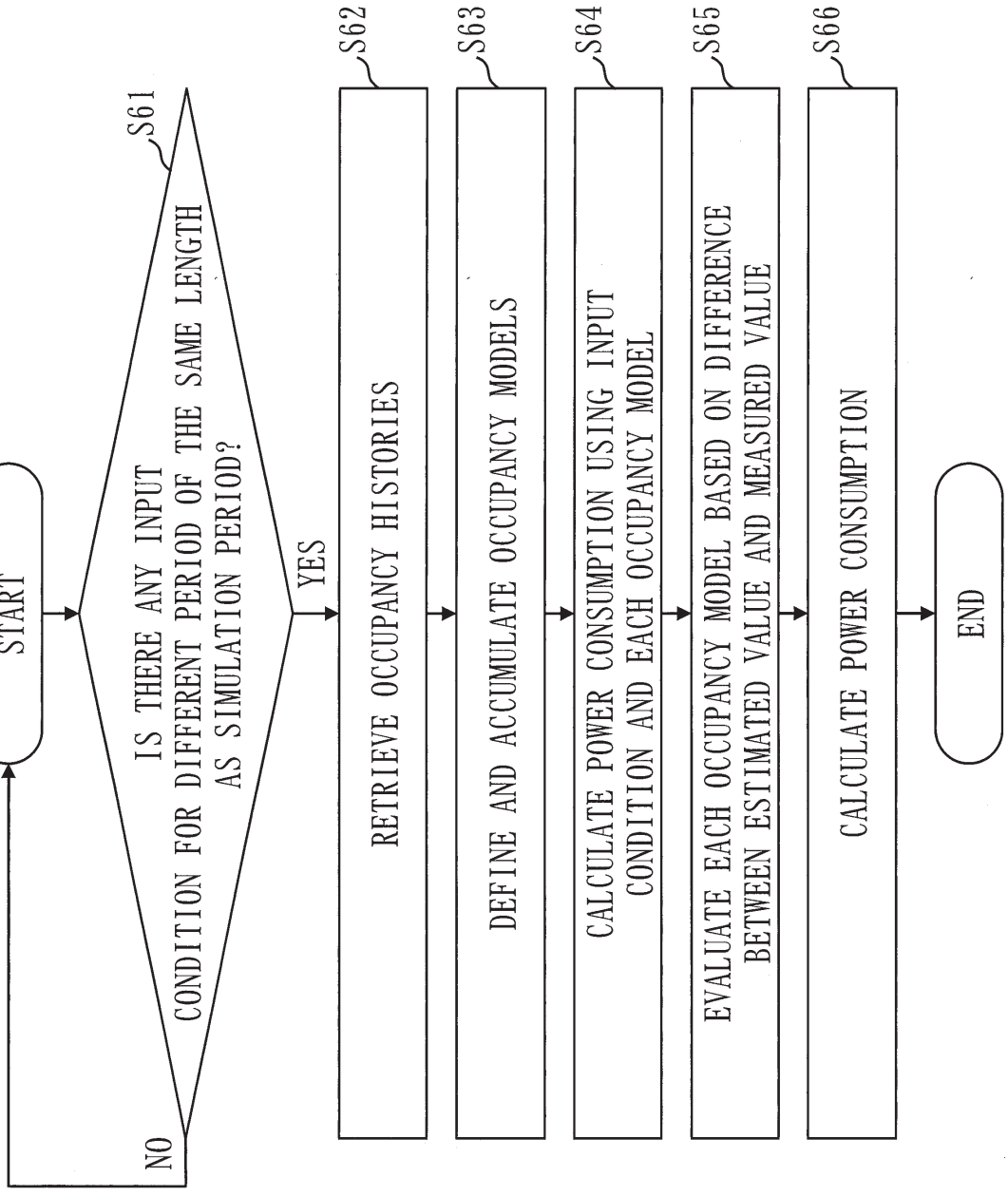

START
S61
IS THERE ANY INPUT CONDITION FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
NO
YES
S62
RETRIEVE OCCUPANCY HISTORIES
S63
DEFINE AND ACCUMULATE OCCUPANCY MODELS
S64
CALCULATE POWER CONSUMPTION USING INPUT CONDITION AND EACH OCCUPANCY MODEL
S65
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S66
CALCULATE POWER CONSUMPTION
END

Fig. 15

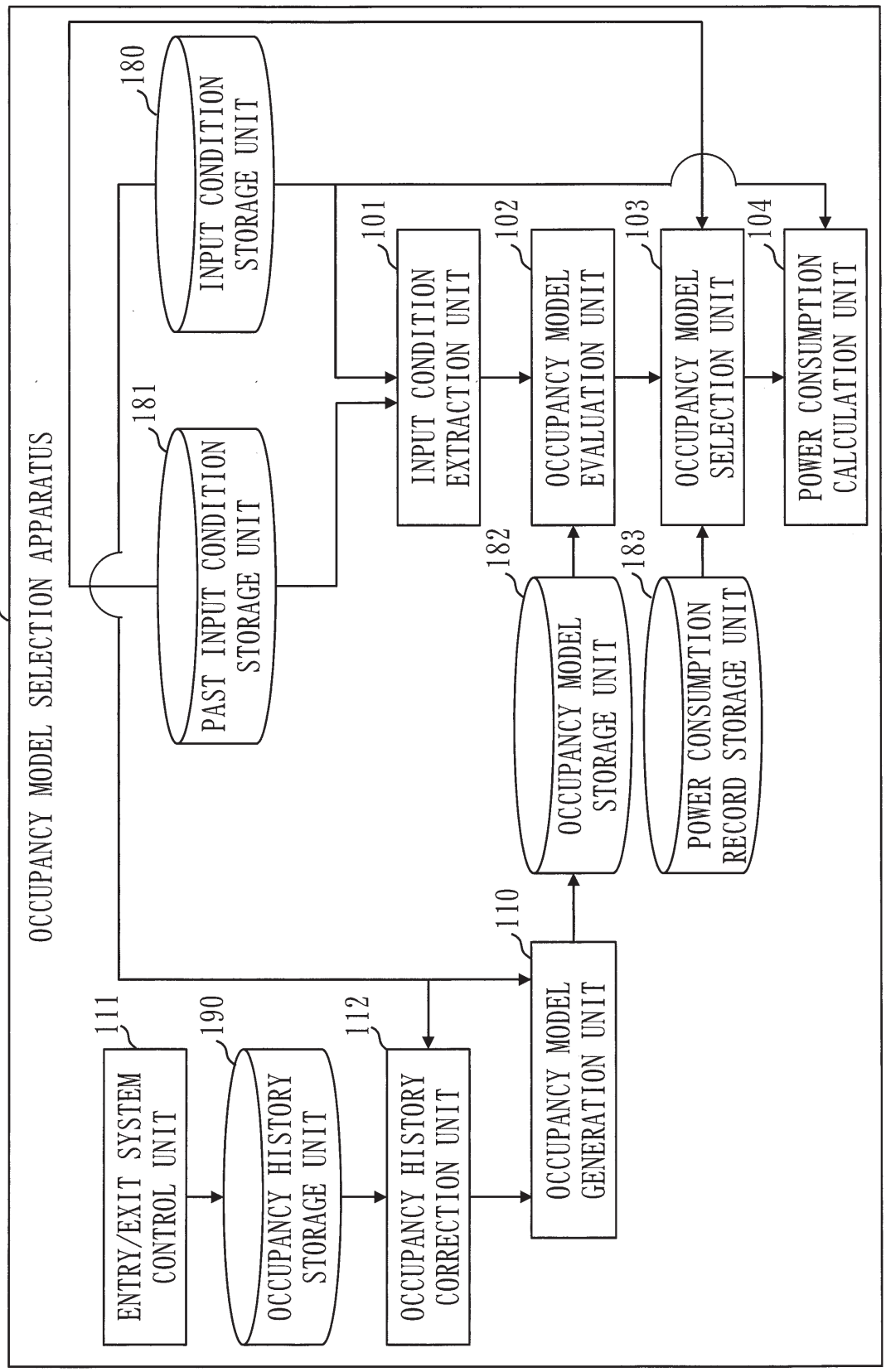

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
101
INPUT CONDITION EXTRACTION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
182
OCCUPANCY MODEL STORAGE UNIT
183
POWER CONSUMPTION RECORD STORAGE UNIT
110
OCCUPANCY MODEL GENERATION UNIT
111
ENTRY/EXIT SYSTEM CONTROL UNIT
190
OCCUPANCY HISTORY STORAGE UNIT
112
OCCUPANCY HISTORY CORRECTION UNIT

Fig. 16

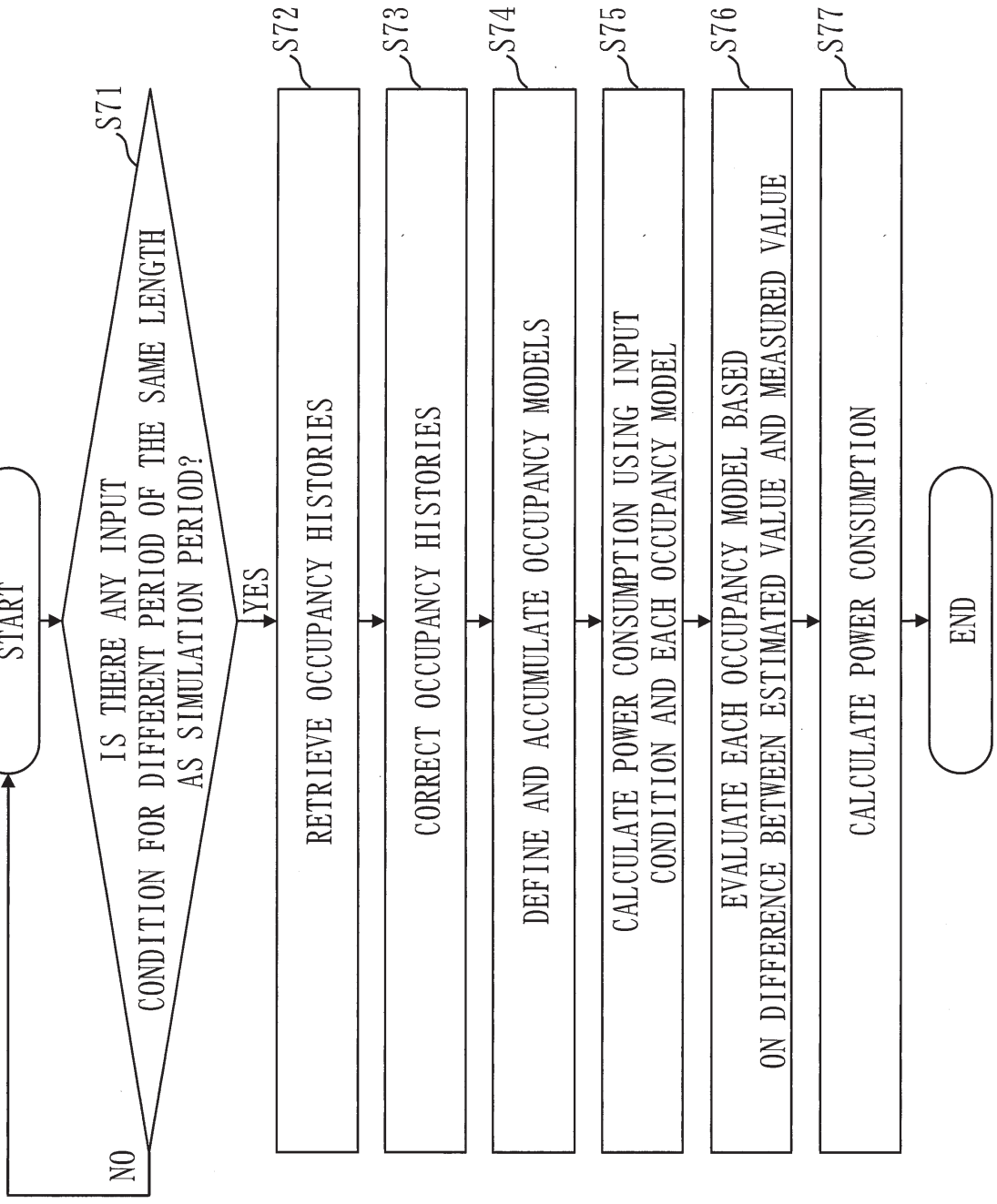
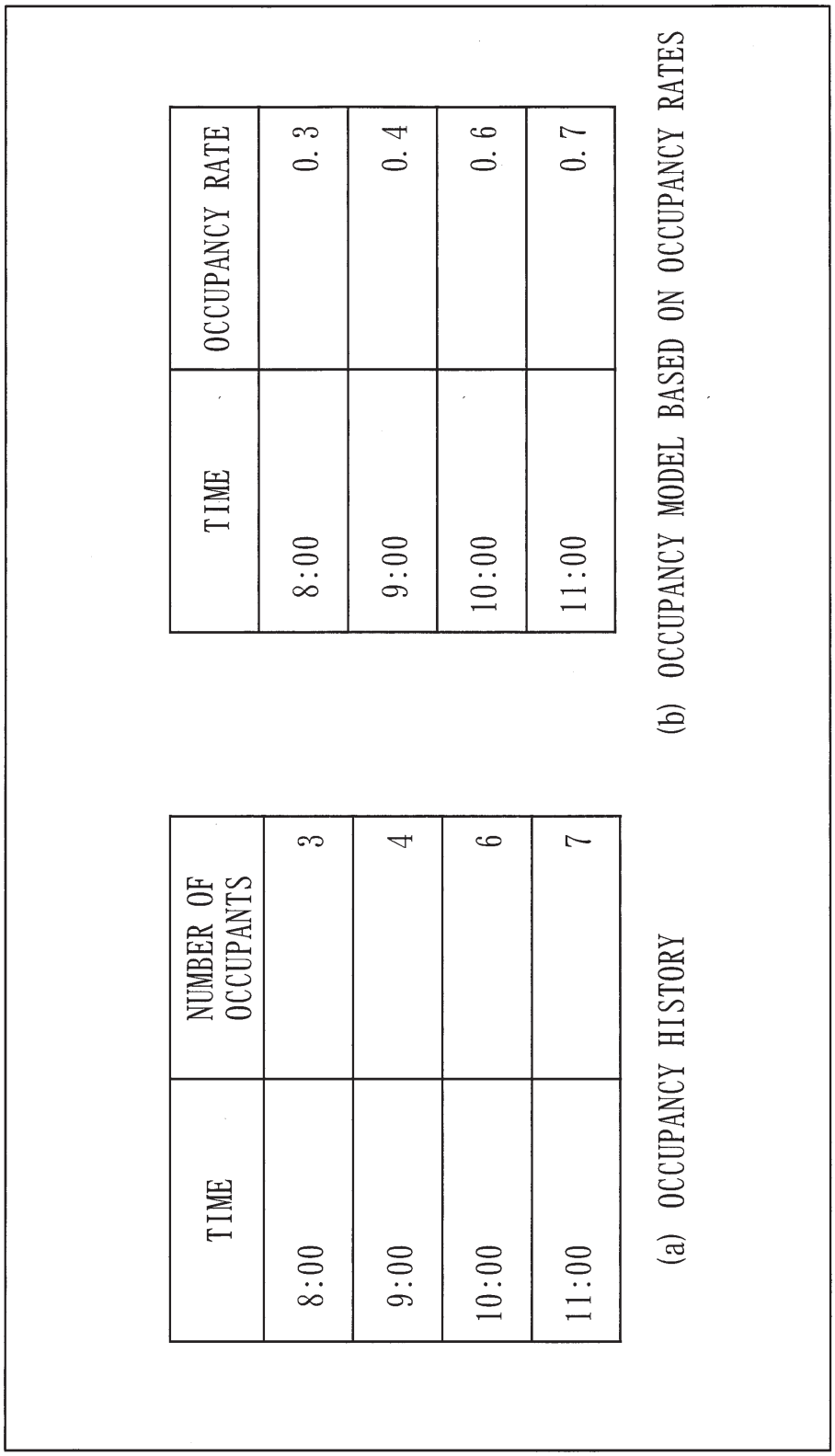

START
S71
IS THERE ANY INPUT CONDITION FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
NO
YES
S72
RETRIEVE OCCUPANCY HISTORIES
S73
CORRECT OCCUPANCY HISTORIES
S74
DEFINE AND ACCUMULATE OCCUPANCY MODELS
S75
CALCULATE POWER CONSUMPTION USING INPUT CONDITION AND EACH OCCUPANCY MODEL
S76
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S77
CALCULATE POWER CONSUMPTION
END

Fig. 17



TIME	NUMBER OF OCCUPANTS
8:00	3
9:00	4
10:00	6
11:00	7

(a) OCCUPANCY HISTORY

TIME	OCCUPANCY RATE
8:00	0.3
9:00	0.4
10:00	0.6
11:00	0.7

(b) OCCUPANCY MODEL BASED ON OCCUPANCY RATES

Fig. 18

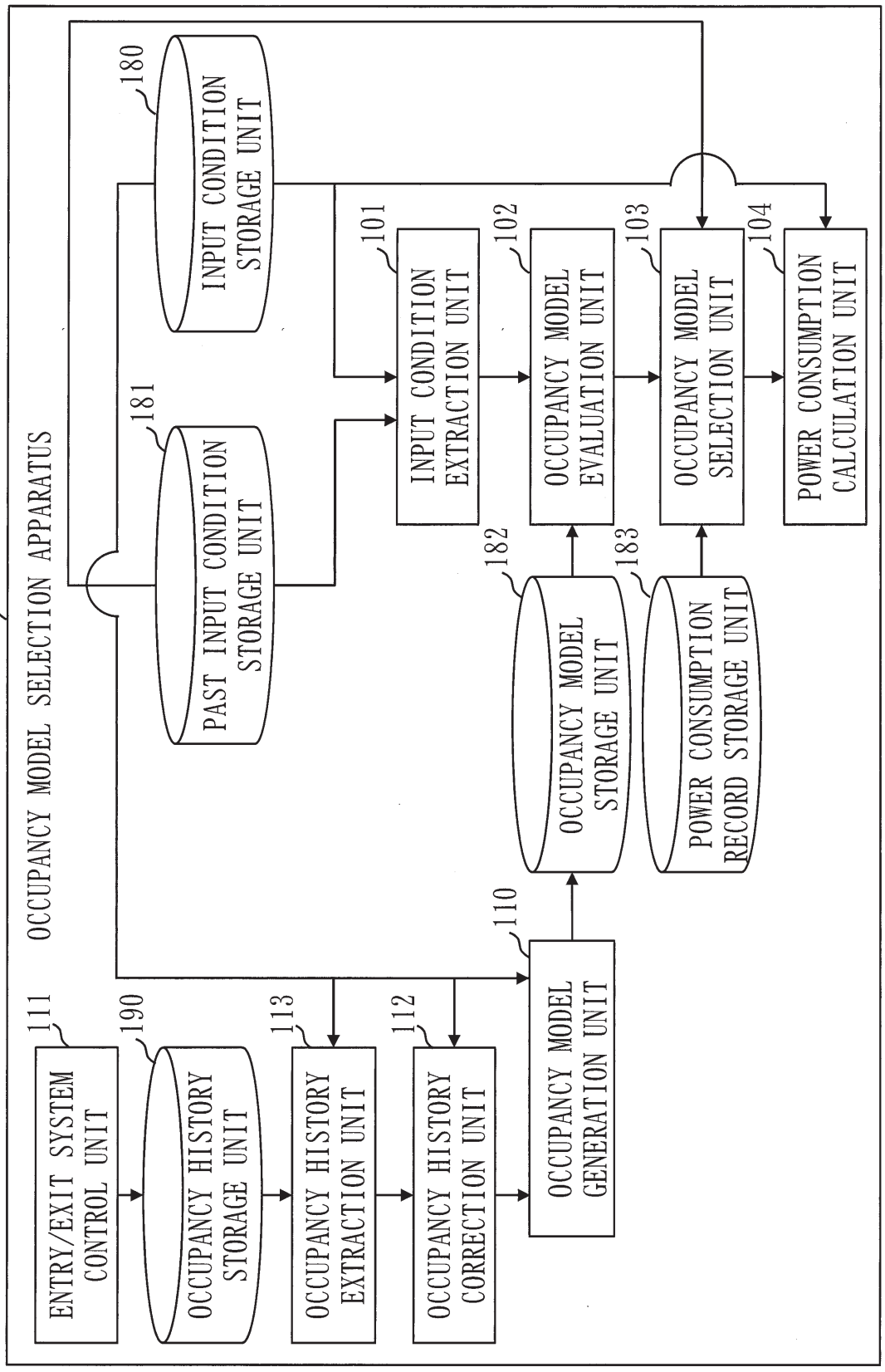

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
101
INPUT CONDITION EXTRACTION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
182
OCCUPANCY MODEL STORAGE UNIT
183
POWER CONSUMPTION RECORD STORAGE UNIT
110
OCCUPANCY MODEL GENERATION UNIT
111
ENTRY/EXIT SYSTEM CONTROL UNIT
190
OCCUPANCY HISTORY STORAGE UNIT
113
OCCUPANCY HISTORY EXTRACTION UNIT
112
OCCUPANCY HISTORY CORRECTION UNIT

Fig.19

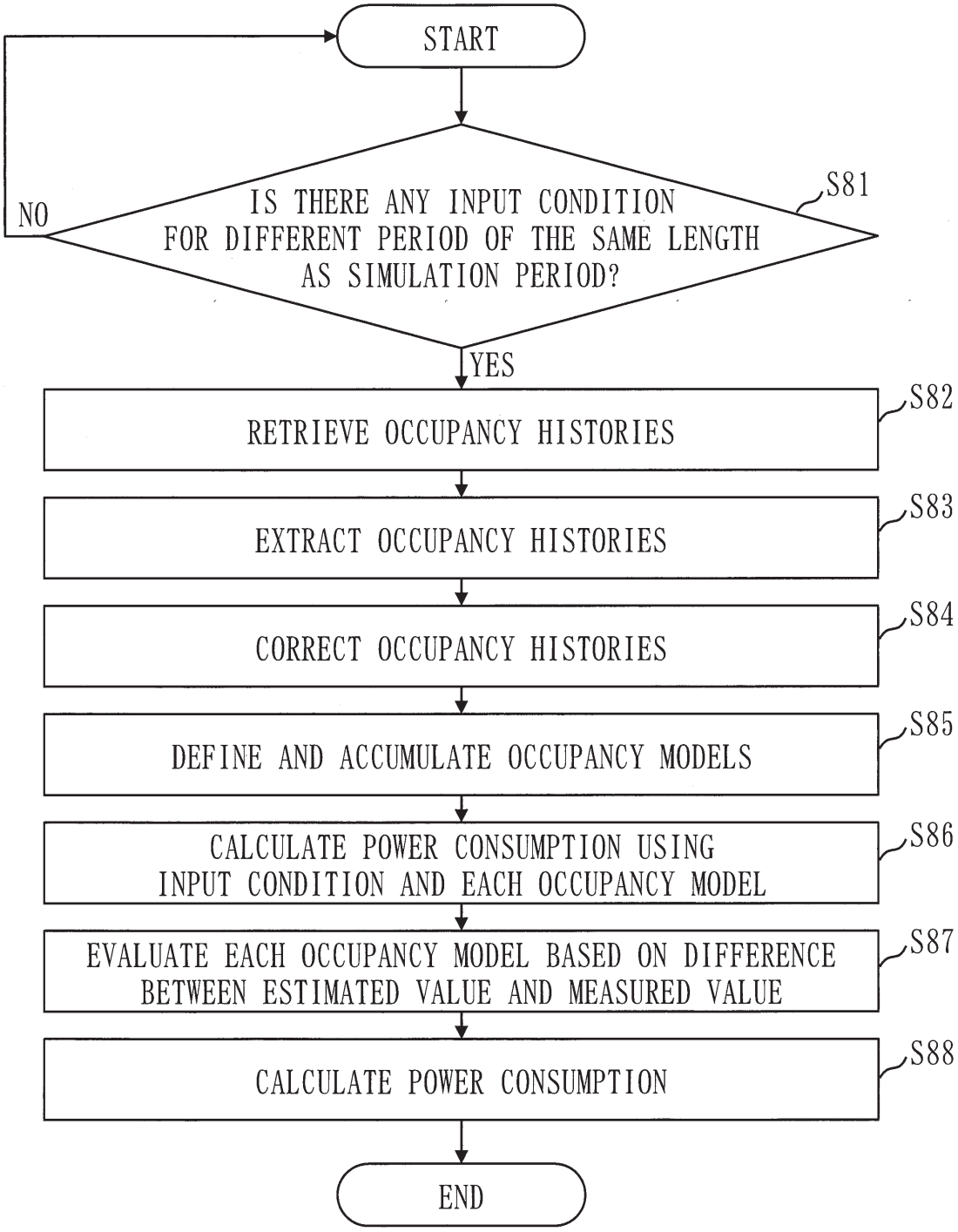

START
IS THERE ANY INPUT CONDITION FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
S81
NO
YES
RETRIEVE OCCUPANCY HISTORIES
S82
EXTRACT OCCUPANCY HISTORIES
S83
CORRECT OCCUPANCY HISTORIES
S84
DEFINE AND ACCUMULATE OCCUPANCY MODELS
S85
CALCULATE POWER CONSUMPTION USING INPUT CONDITION AND EACH OCCUPANCY MODEL
S86
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S87
CALCULATE POWER CONSUMPTION
S88
END

Fig. 20

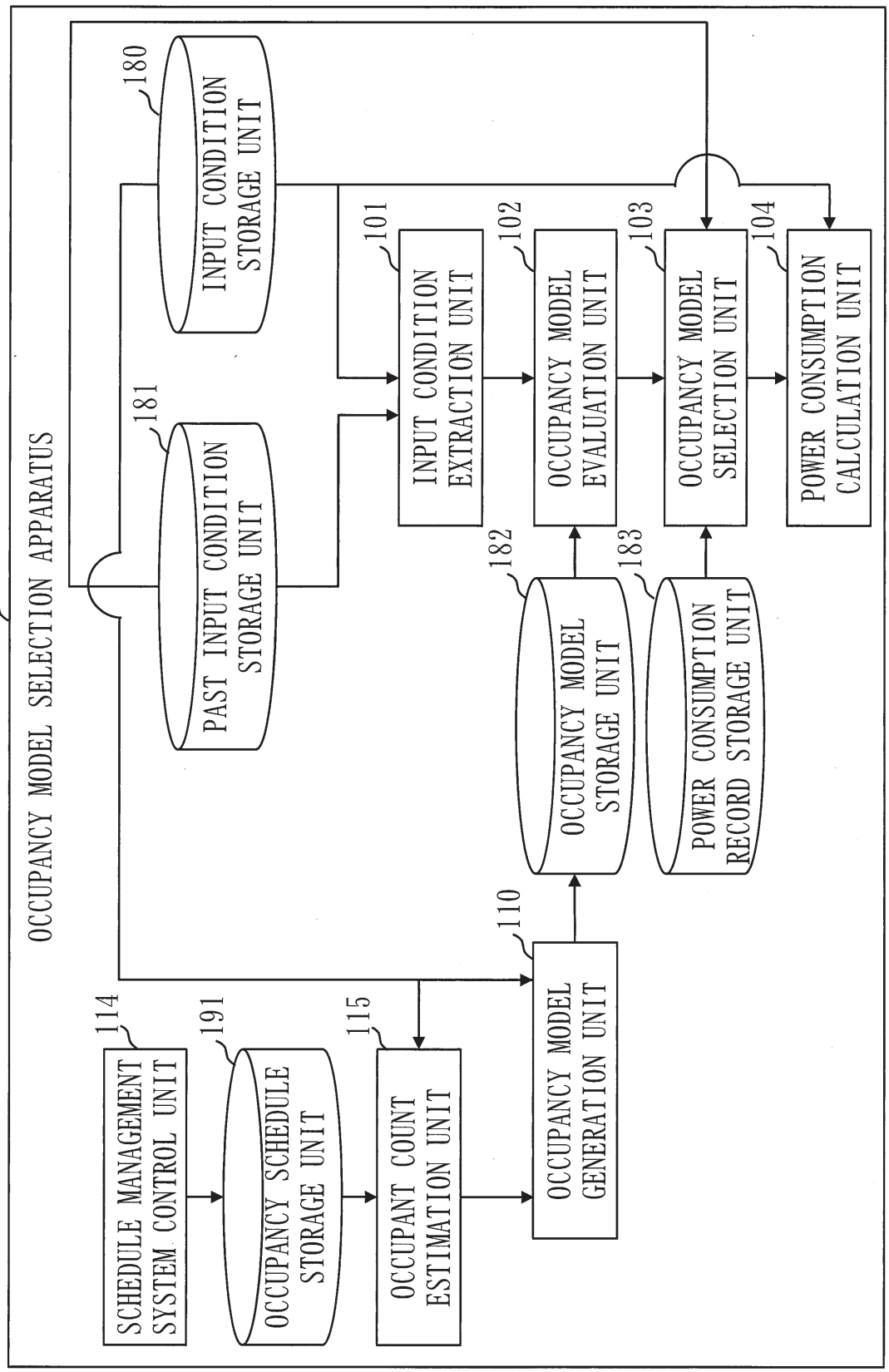

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
101
INPUT CONDITION EXTRACTION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
182
OCCUPANCY MODEL STORAGE UNIT
183
POWER CONSUMPTION RECORD STORAGE UNIT
110
OCCUPANCY MODEL GENERATION UNIT
114
SCHEDULE MANAGEMENT SYSTEM CONTROL UNIT
191
OCCUPANCY SCHEDULE STORAGE UNIT
115
OCCUPANT COUNT ESTIMATION UNIT

Fig. 21

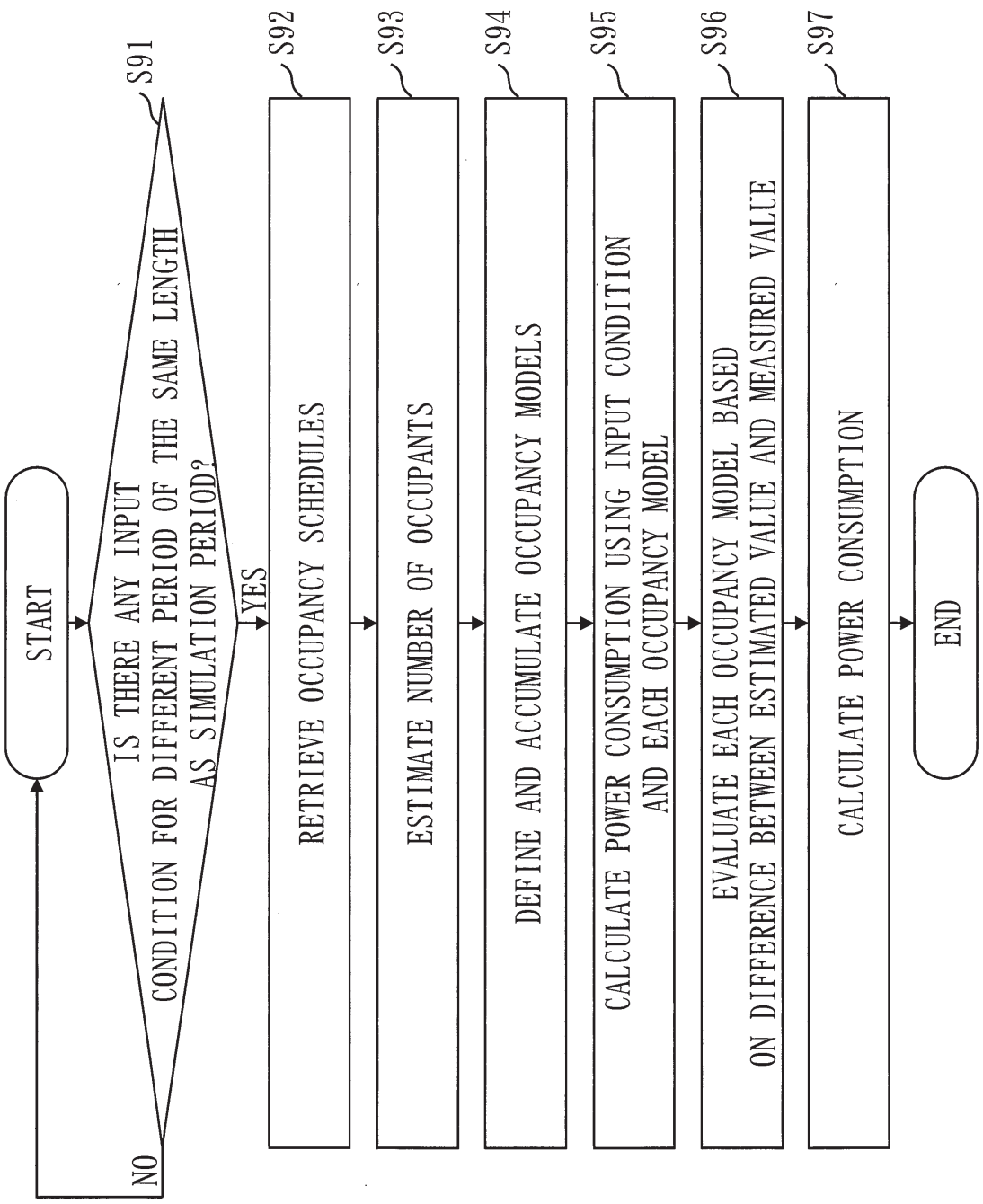

START
S91
IS THERE ANY INPUT CONDITION FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
NO
YES
S92
RETRIEVE OCCUPANCY SCHEDULES
S93
ESTIMATE NUMBER OF OCCUPANTS
S94
DEFINE AND ACCUMULATE OCCUPANCY MODELS
S95
CALCULATE POWER CONSUMPTION USING INPUT CONDITION AND EACH OCCUPANCY MODEL
S96
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S97
CALCULATE POWER CONSUMPTION
END

Fig. 22

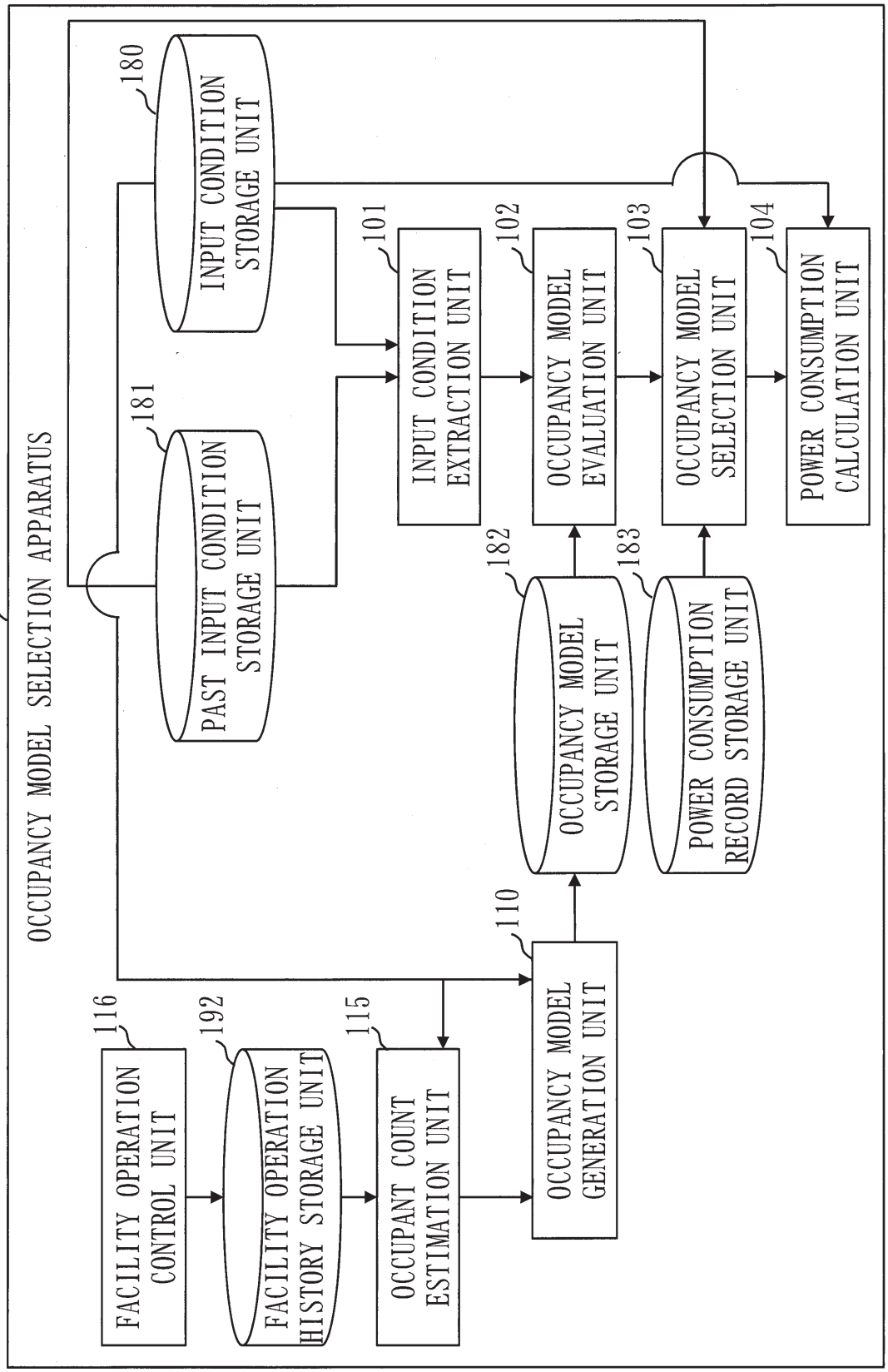

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
101
INPUT CONDITION EXTRACTION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
182
OCCUPANCY MODEL STORAGE UNIT
183
POWER CONSUMPTION RECORD STORAGE UNIT
110
OCCUPANCY MODEL GENERATION UNIT
116
FACILITY OPERATION CONTROL UNIT
192
FACILITY OPERATION HISTORY STORAGE UNIT
115
OCCUPANT COUNT ESTIMATION UNIT

Fig. 23

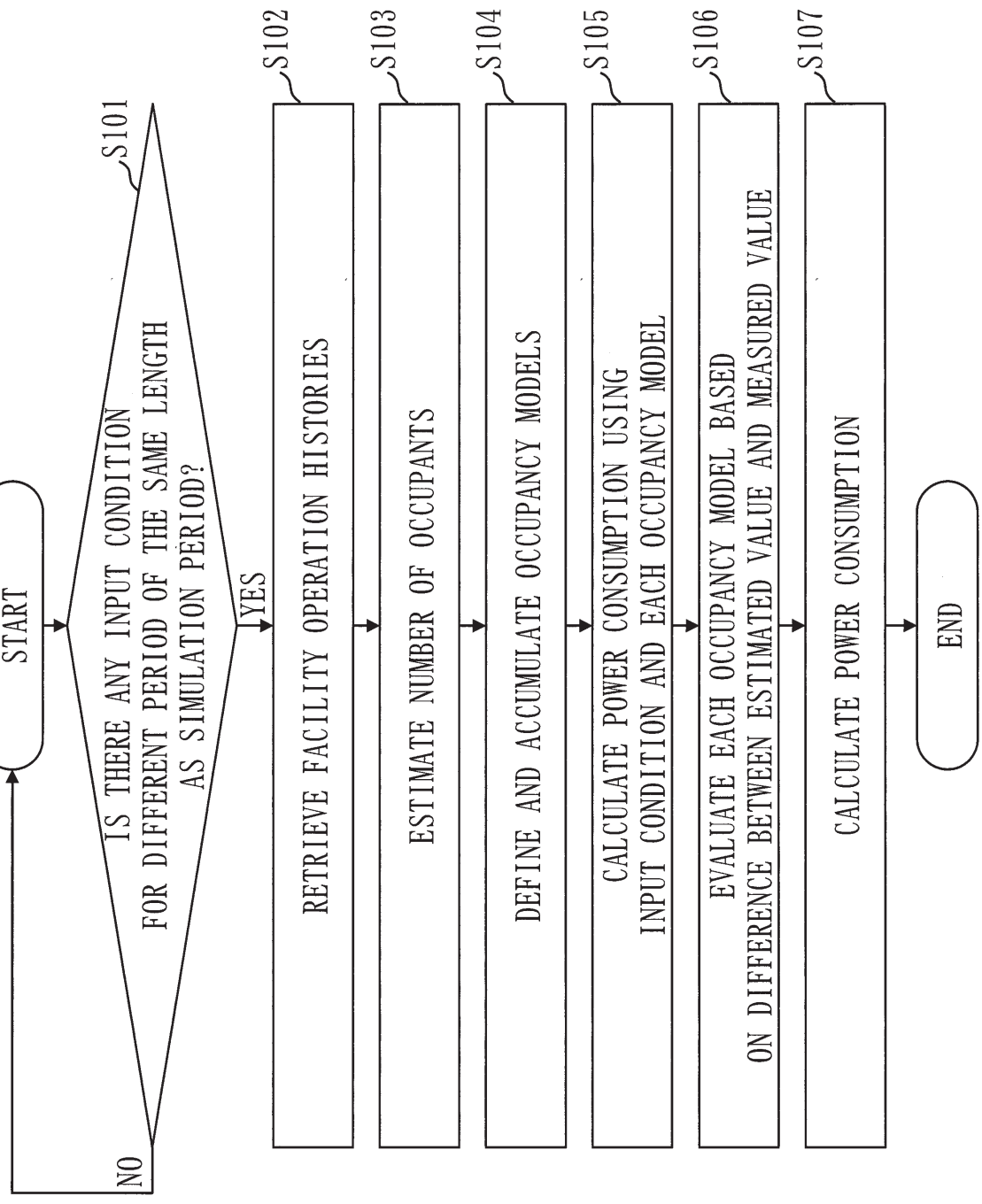

START
S101
IS THERE ANY INPUT CONDITION FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
NO
YES
S102
RETRIEVE FACILITY OPERATION HISTORIES
S103
ESTIMATE NUMBER OF OCCUPANTS
S104
DEFINE AND ACCUMULATE OCCUPANCY MODELS
S105
CALCULATE POWER CONSUMPTION USING INPUT CONDITION AND EACH OCCUPANCY MODEL
S106
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S107
CALCULATE POWER CONSUMPTION
END

Fig. 24

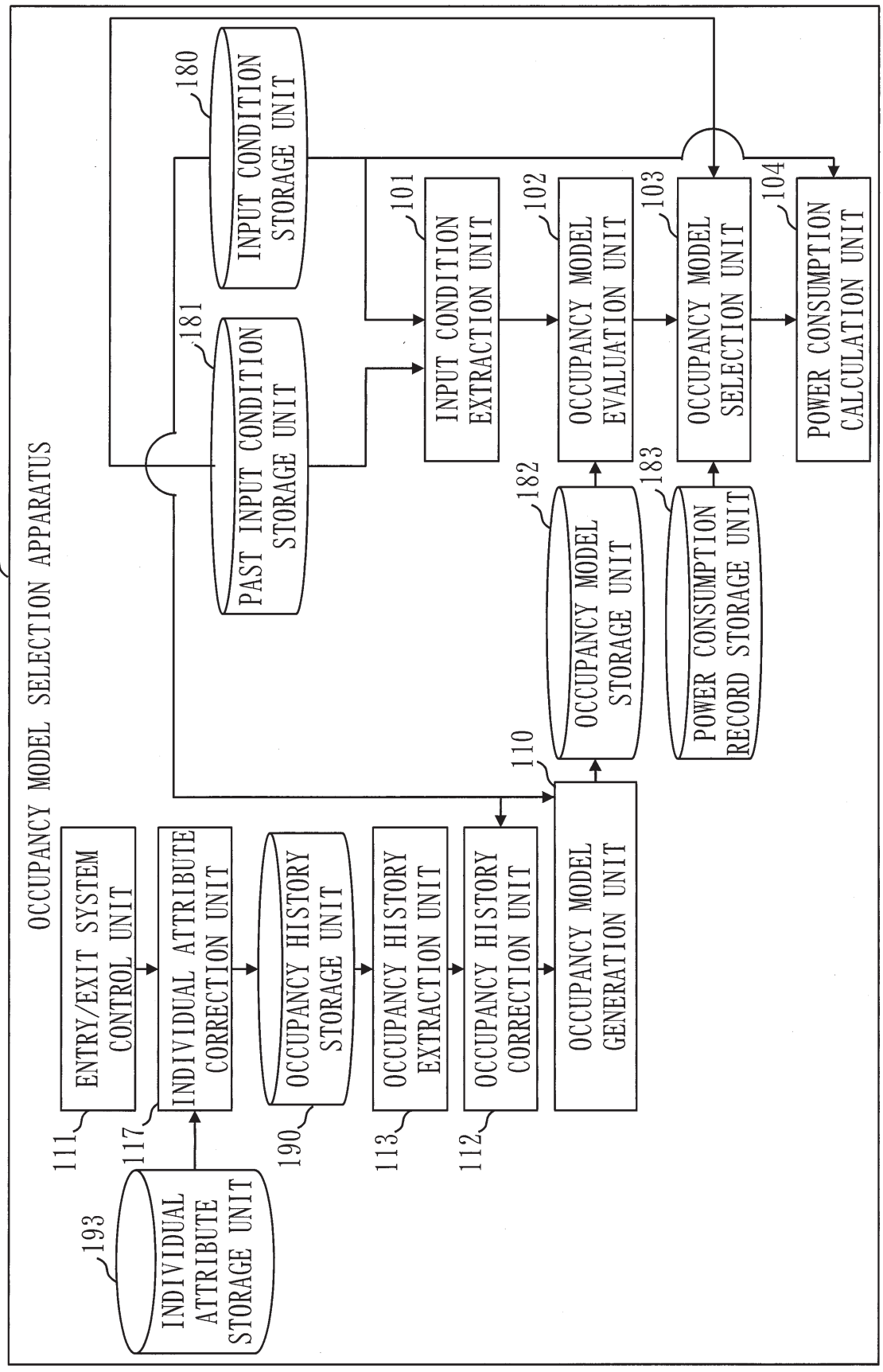

100
OCCUPANCY MODEL SELECTION APPARATUS
ENTRY/EXIT SYSTEM CONTROL UNIT
111
INDIVIDUAL ATTRIBUTE CORRECTION UNIT
117
INDIVIDUAL ATTRIBUTE STORAGE UNIT
193
OCCUPANCY HISTORY STORAGE UNIT
190
OCCUPANCY HISTORY EXTRACTION UNIT
113
OCCUPANCY HISTORY CORRECTION UNIT
112
OCCUPANCY MODEL GENERATION UNIT
110
OCCUPANCY MODEL STORAGE UNIT
182
POWER CONSUMPTION RECORD STORAGE UNIT
183
PAST INPUT CONDITION STORAGE UNIT
181
INPUT CONDITION STORAGE UNIT
180
INPUT CONDITION EXTRACTION UNIT
101
OCCUPANCY MODEL EVALUATION UNIT
102
OCCUPANCY MODEL SELECTION UNIT
103
POWER CONSUMPTION CALCULATION UNIT
104

Fig.25

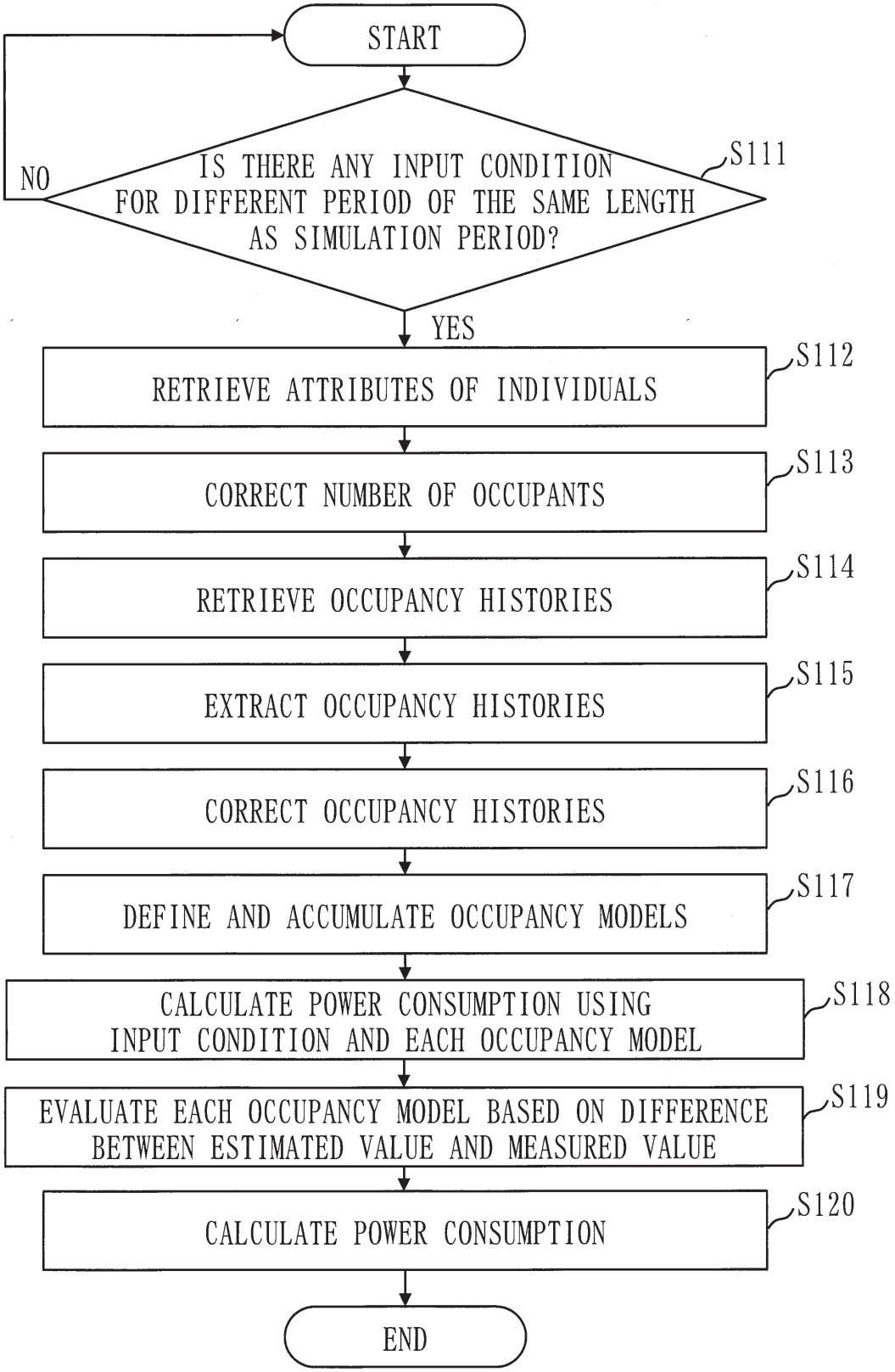

START
IS THERE ANY INPUT CONDITION FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
S111
NO
YES
RETRIEVE ATTRIBUTES OF INDIVIDUALS
S112
CORRECT NUMBER OF OCCUPANTS
S113
RETRIEVE OCCUPANCY HISTORIES
S114
EXTRACT OCCUPANCY HISTORIES
S115
CORRECT OCCUPANCY HISTORIES
S116
DEFINE AND ACCUMULATE OCCUPANCY MODELS
S117
CALCULATE POWER CONSUMPTION USING INPUT CONDITION AND EACH OCCUPANCY MODEL
S118
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S119
CALCULATE POWER CONSUMPTION
S120
END

Fig. 26

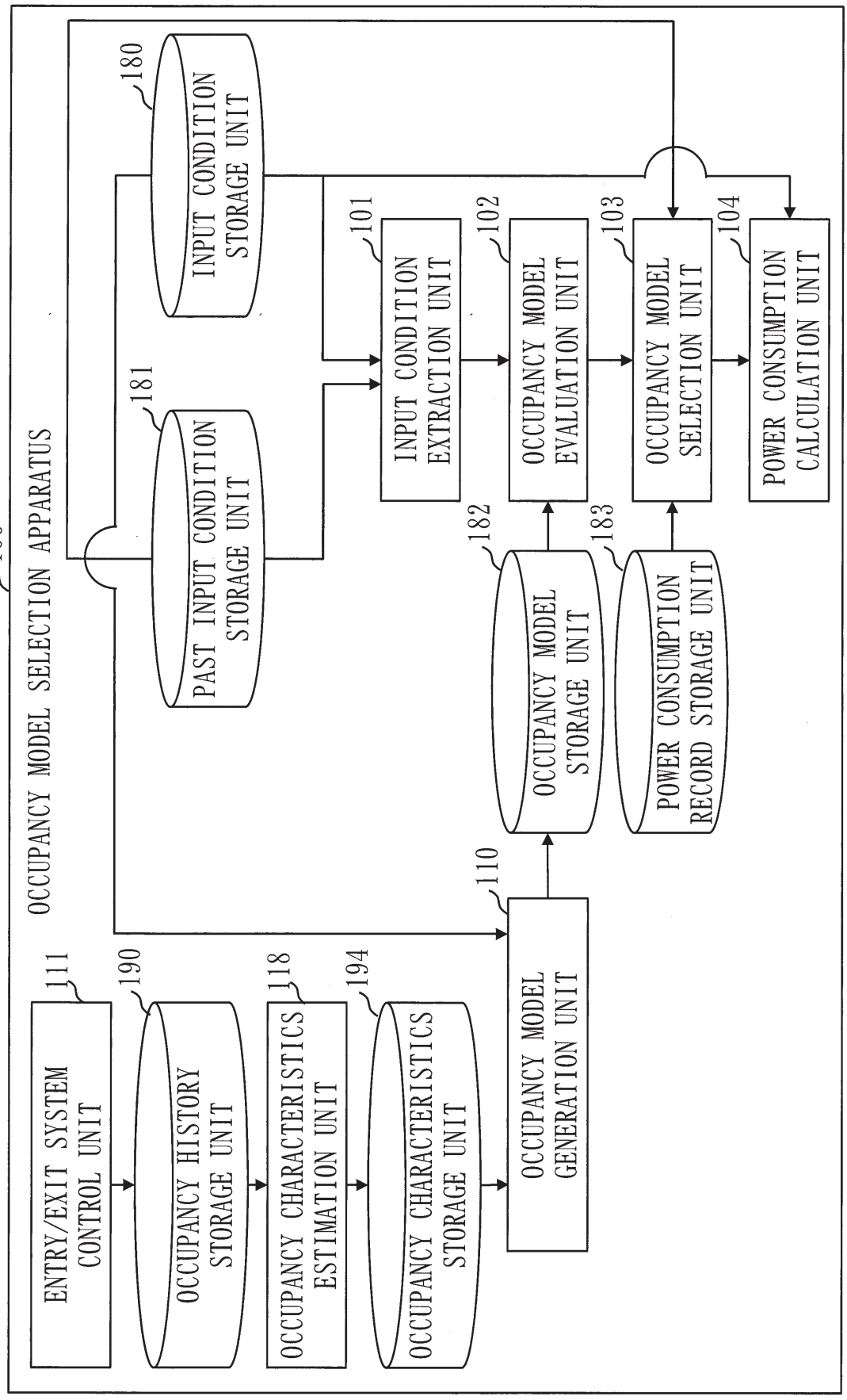
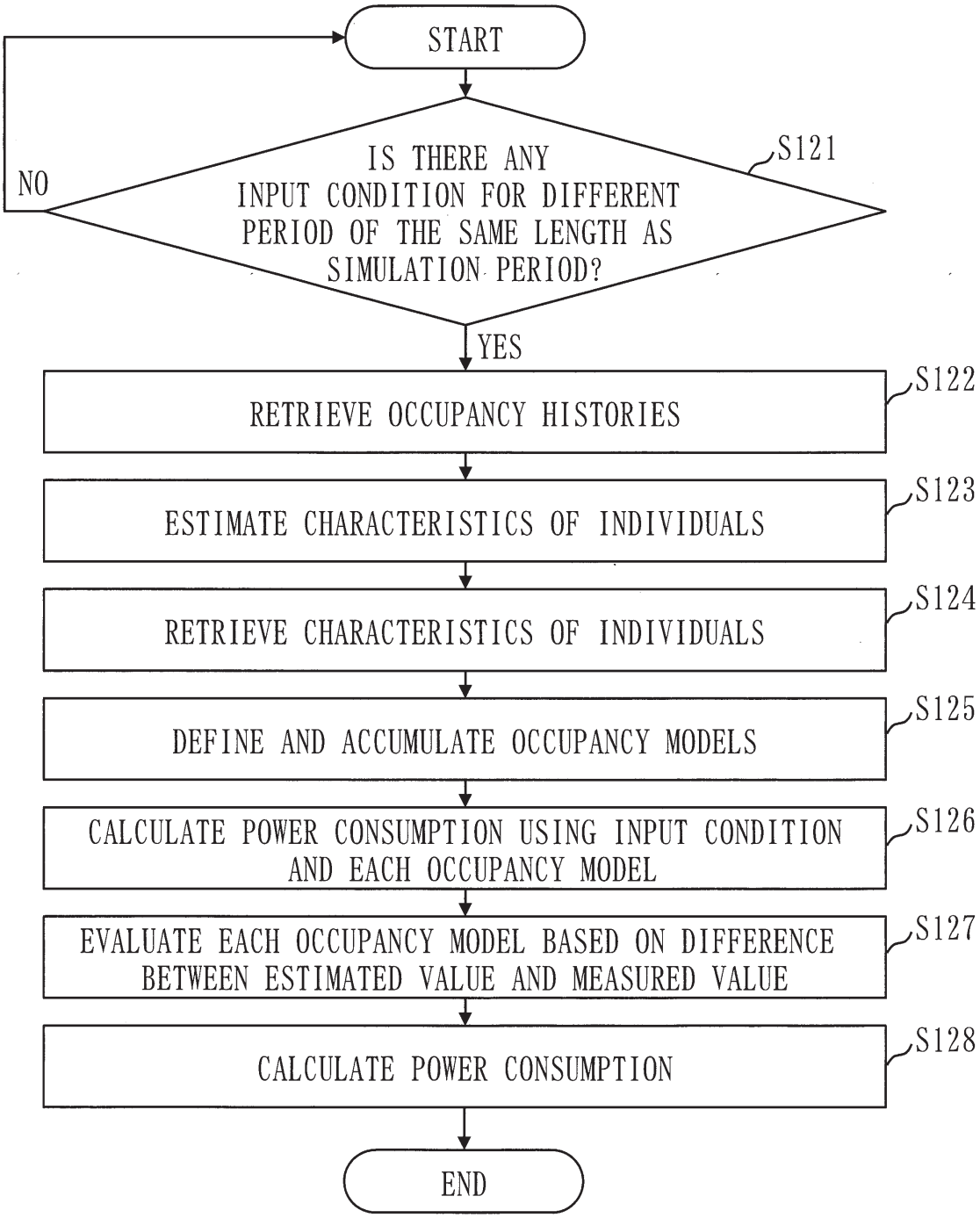

100
OCCUPANCY MODEL SELECTION APPARATUS
180
INPUT CONDITION STORAGE UNIT
181
PAST INPUT CONDITION STORAGE UNIT
101
INPUT CONDITION EXTRACTION UNIT
102
OCCUPANCY MODEL EVALUATION UNIT
103
OCCUPANCY MODEL SELECTION UNIT
104
POWER CONSUMPTION CALCULATION UNIT
182
OCCUPANCY MODEL STORAGE UNIT
183
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111
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190
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118
OCCUPANCY CHARACTERISTICS ESTIMATION UNIT
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OCCUPANCY CHARACTERISTICS STORAGE UNIT

Fig.27


START
IS THERE ANY INPUT CONDITION FOR DIFFERENT PERIOD OF THE SAME LENGTH AS SIMULATION PERIOD?
S121
NO
YES
RETRIEVE OCCUPANCY HISTORIES
S122
ESTIMATE CHARACTERISTICS OF INDIVIDUALS
S123
RETRIEVE CHARACTERISTICS OF INDIVIDUALS
S124
DEFINE AND ACCUMULATE OCCUPANCY MODELS
S125
CALCULATE POWER CONSUMPTION USING INPUT CONDITION AND EACH OCCUPANCY MODEL
S126
EVALUATE EACH OCCUPANCY MODEL BASED ON DIFFERENCE BETWEEN ESTIMATED VALUE AND MEASURED VALUE
S127
CALCULATE POWER CONSUMPTION
S128
END