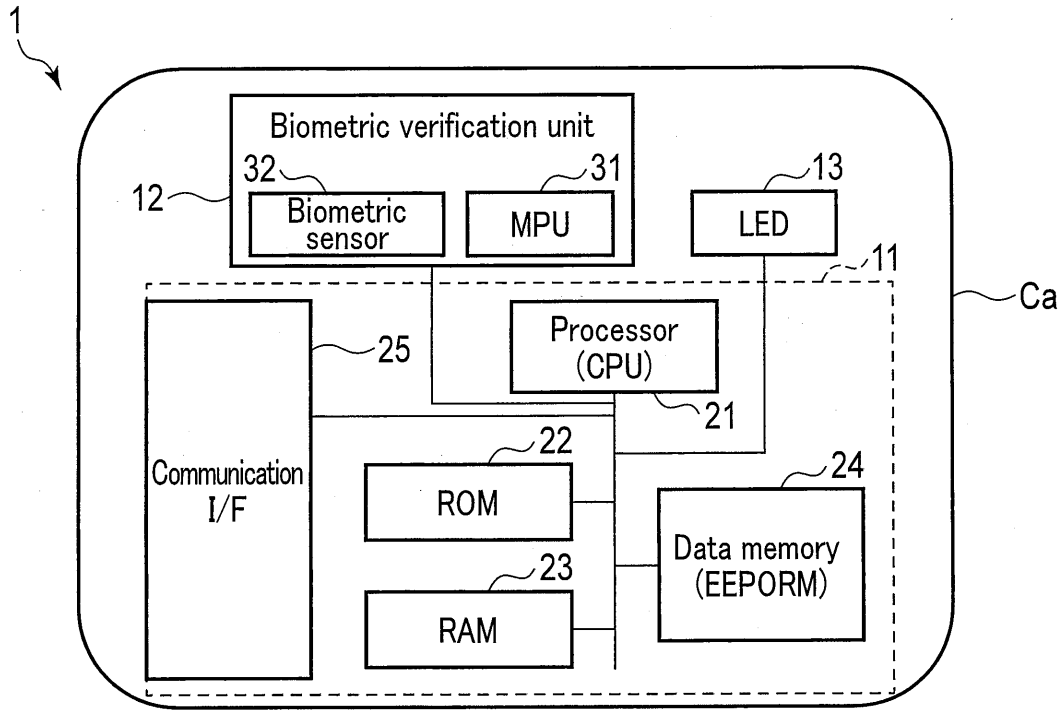
1
Biometric verification unit
32
31
12
Biometric sensor
MPU
13
LED
11
Ca
25
Processor (CPU)
21
22
Communication I/F
ROM
24
Data memory (EEPORM)
23
RAM

FIG. 1

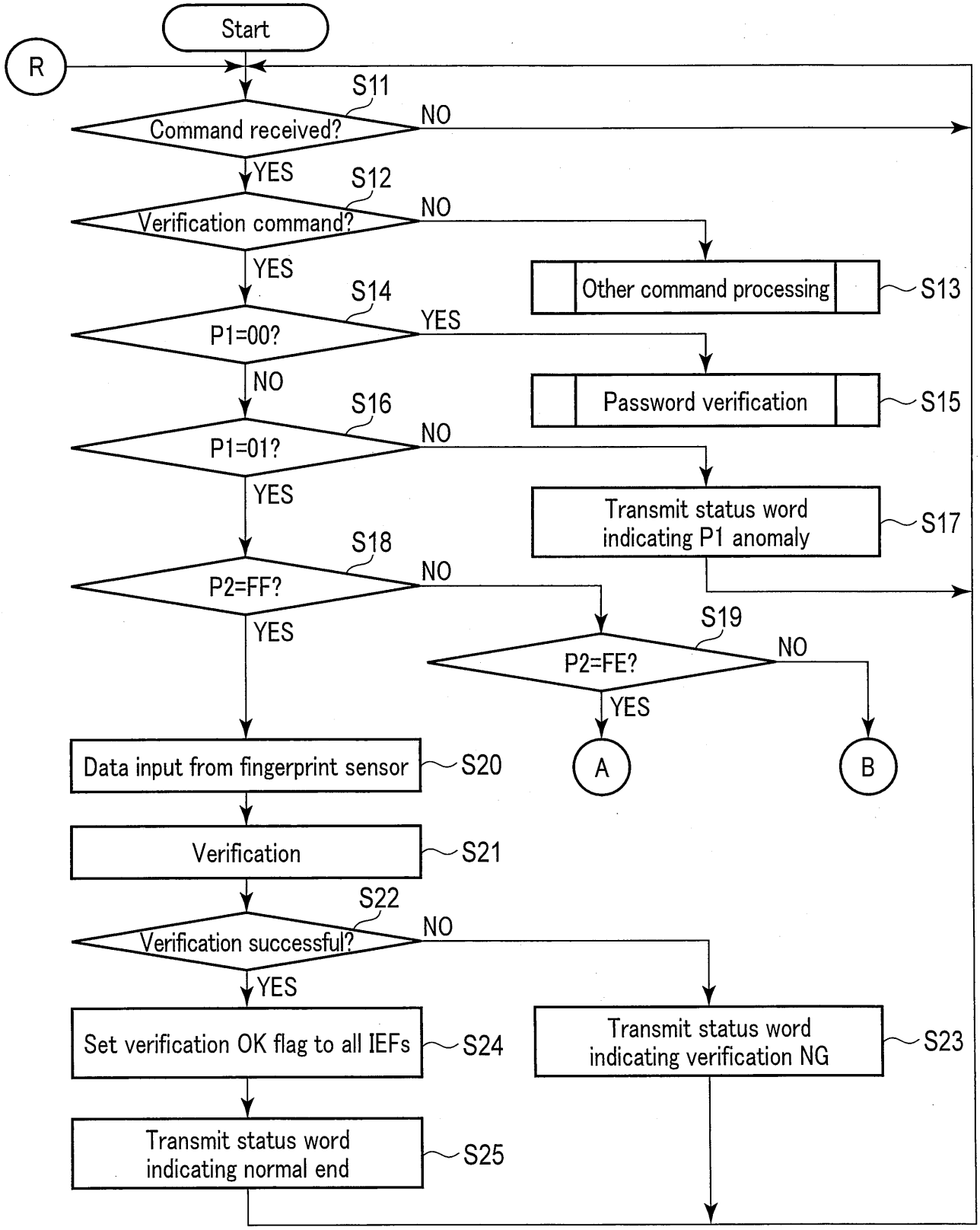
Start
R
S11
Command received?
NO
YES
S12
Verification command?
NO
YES
Other command processing
S13
S14
P1=00?
YES
NO
Password verification
S15
S16
P1=01?
NO
YES
Transmit status word indicating P1 anomaly
S17
S18
P2=FF?
NO
YES
S19
P2=FE?
NO
YES
A
B
Data input from fingerprint sensor
S20
Verification
S21
S22
Verification successful?
NO
YES
Set verification OK flag to all IEFs
S24
Transmit status word indicating verification NG
S23
Transmit status word indicating normal end
S25

FIG. 2

CLA	INS	P1	P2	Lc	Data
00	20	01	FF	--	---

FIG. 3

CLA	INS	P1	P2	Lc	Data
00	20	01	FE	--	---

FIG. 4

CLA	INS	P1	P2	Lc	Data
00	20	00	82	XX	Password data

FIG. 5

b8	b7	B6	b5	b4	B3	b2	b1	Meaning
0	0	0	0	0	0	0	X	X(0): Password verification X(1): Fingerprint information input and verification

FIG. 6

b8	b7	B6	b5	b4	B3	b2	b1	Meaning
1	0	0	X	X	X	X	X	<P1=00>password Designate password (IEF) number ("11111" is prohibited) <P1=01>input & verify fingerprint information Designate fingerprint information (IEF) number ("11111" is prohibited) <P2=FF>reflect verification result to verification states of all passwords <P2=FE>reflect verification result to verification state of password associated with fingerprint information

FIG. 7

IEF	Verification state	Meaning
01	01	Verified
02	01	Verified
03	01	Verified
04	01	Verified
⋮	⋮	⋮

FIG. 8

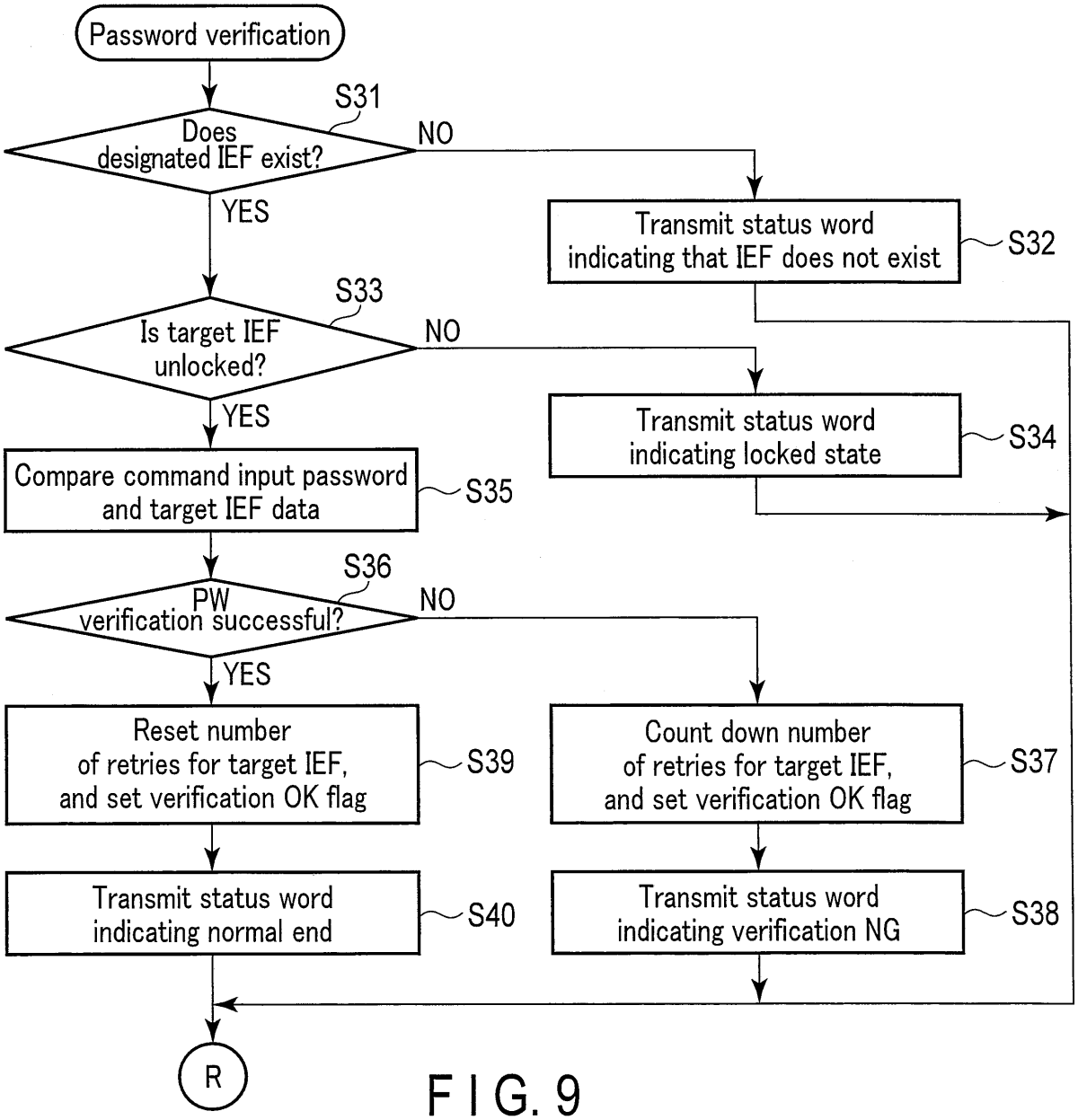

FIG. 9

IEF	Password registration data	Length	Retry counter	Retry counter initial value
01	11 22 33 44	4byte	03	05
02	83 24 70 74 17 96 32 79	8byte	05	05
03	31 32 33 34	4byte	01	03
04	83 65 37 51 32 76 54 19 04 78 35 76 92 35 69 83	16byte	10	10
⋮	⋮			

FIG. 10

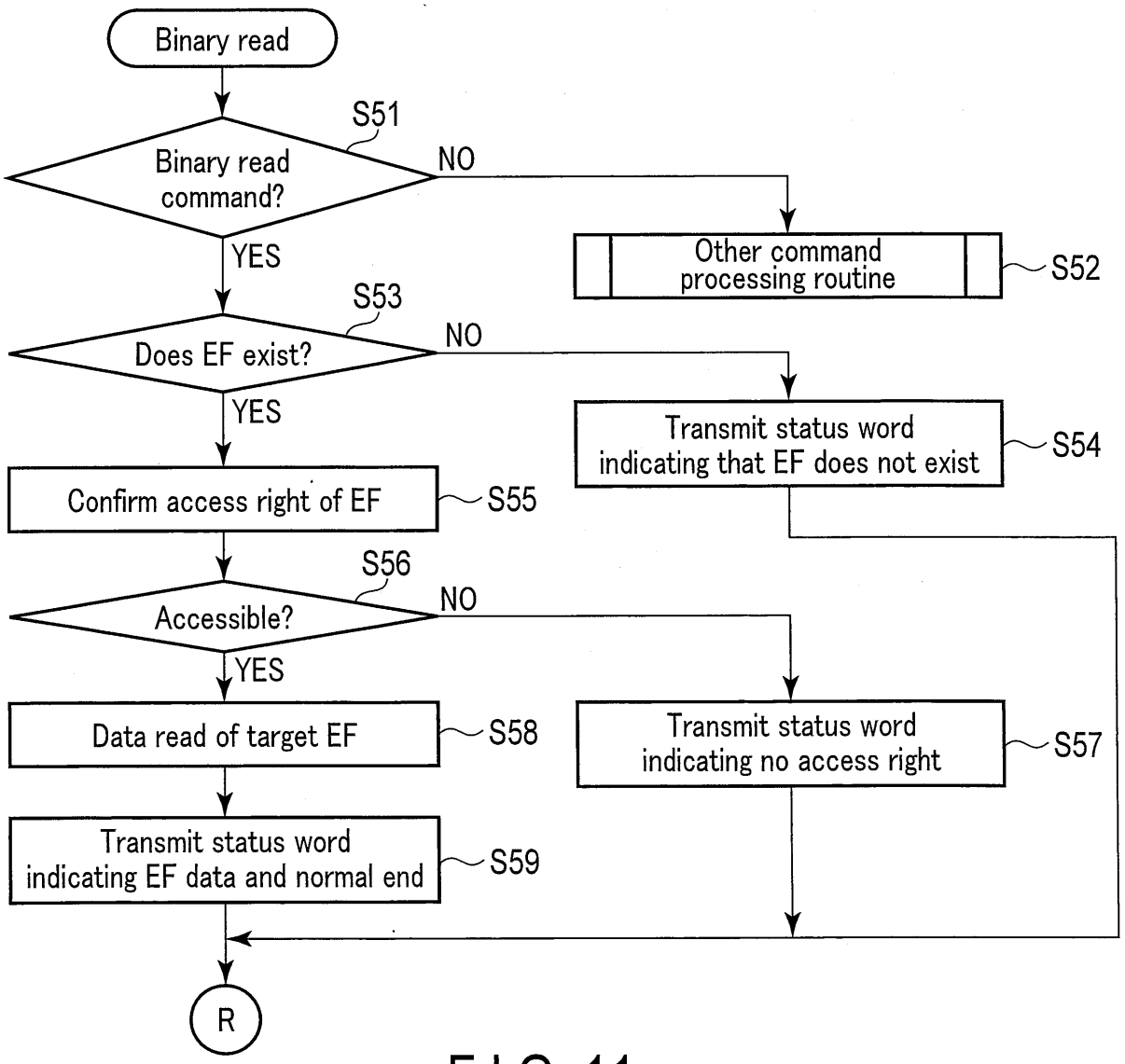

FIG. 11

CLA	INS	P1	P2	Le	
00	B0	xx	xx	XX	

FIG. 12

b8	b7	B6	b5	b4	B3	b2	b1	Meaning
1	0	0	0	0	0	0	0	Current EF designation
1	0	0	X	X	X	X	X	Data (EF) number

FIG. 13

b8	b7	B6	b5	b4	B3	b2	b1	Meaning
X	X	X	X	X	X	X	X	Target EF read address designation (relative address)

FIG. 14

Data (EF) number	Size byte	Physical address	Read access right	Write access right
01	100 h	1000 h	00	04
02	20 h	1100 h	01	04
03	50 h	1120 h	03	04
04	80 h	1170 h	03	04
⋮	⋮			

FIG. 15

Address	Size byte
1000 h	Actual data 1
1100 h	Actual data 2
1120 h	Actual data 3
1170 h	Actual data 4
⋮	⋮

FIG. 16

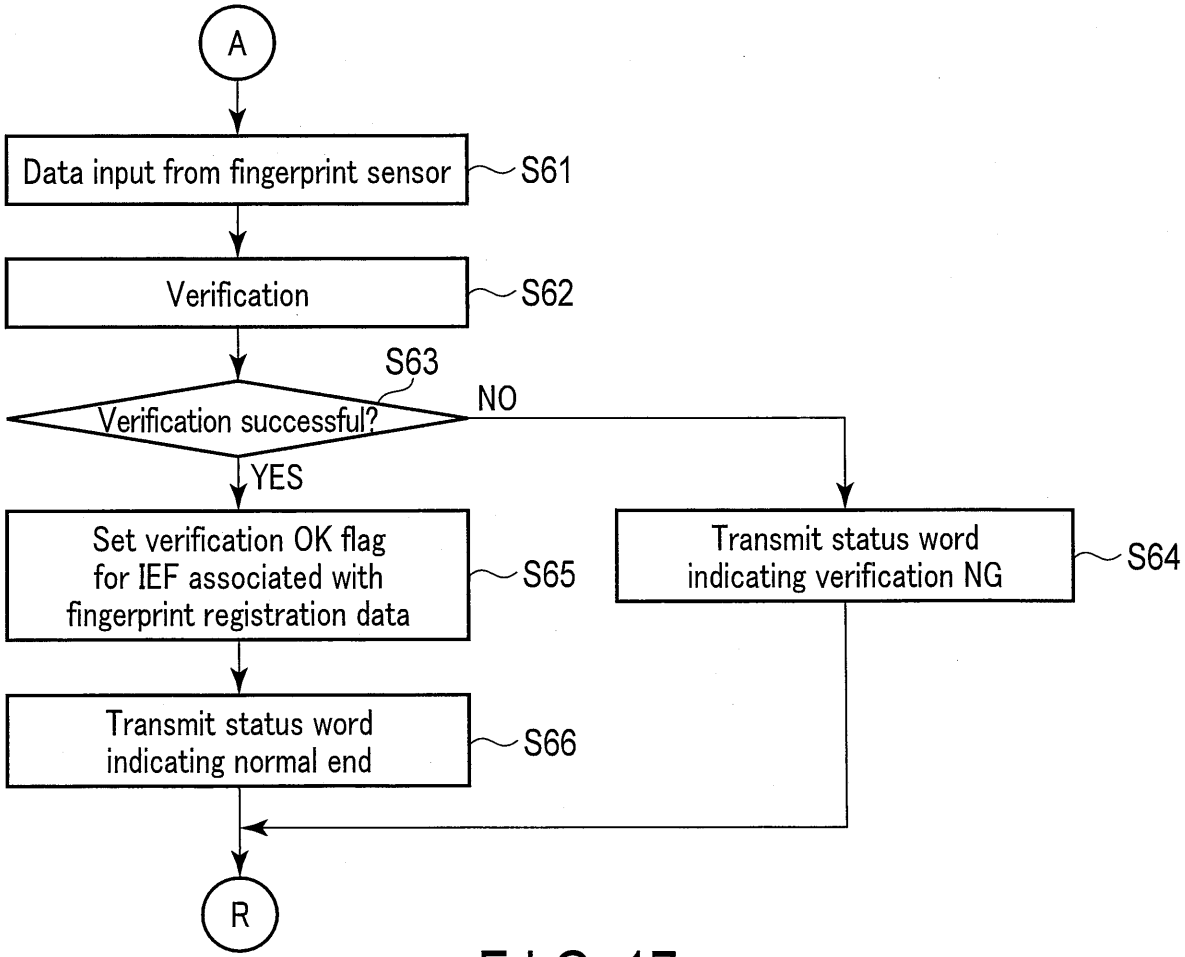

FIG. 17

IEF	Fingerprint registration data	Length
01, 03	Fingerprint data	xx byte

FIG. 18

IEF	Verification state	Meaning
01	01	Verified
02	00	Unverified
03	01	Verified
04	00	Unverified
⋮	⋮	⋮

FIG. 19

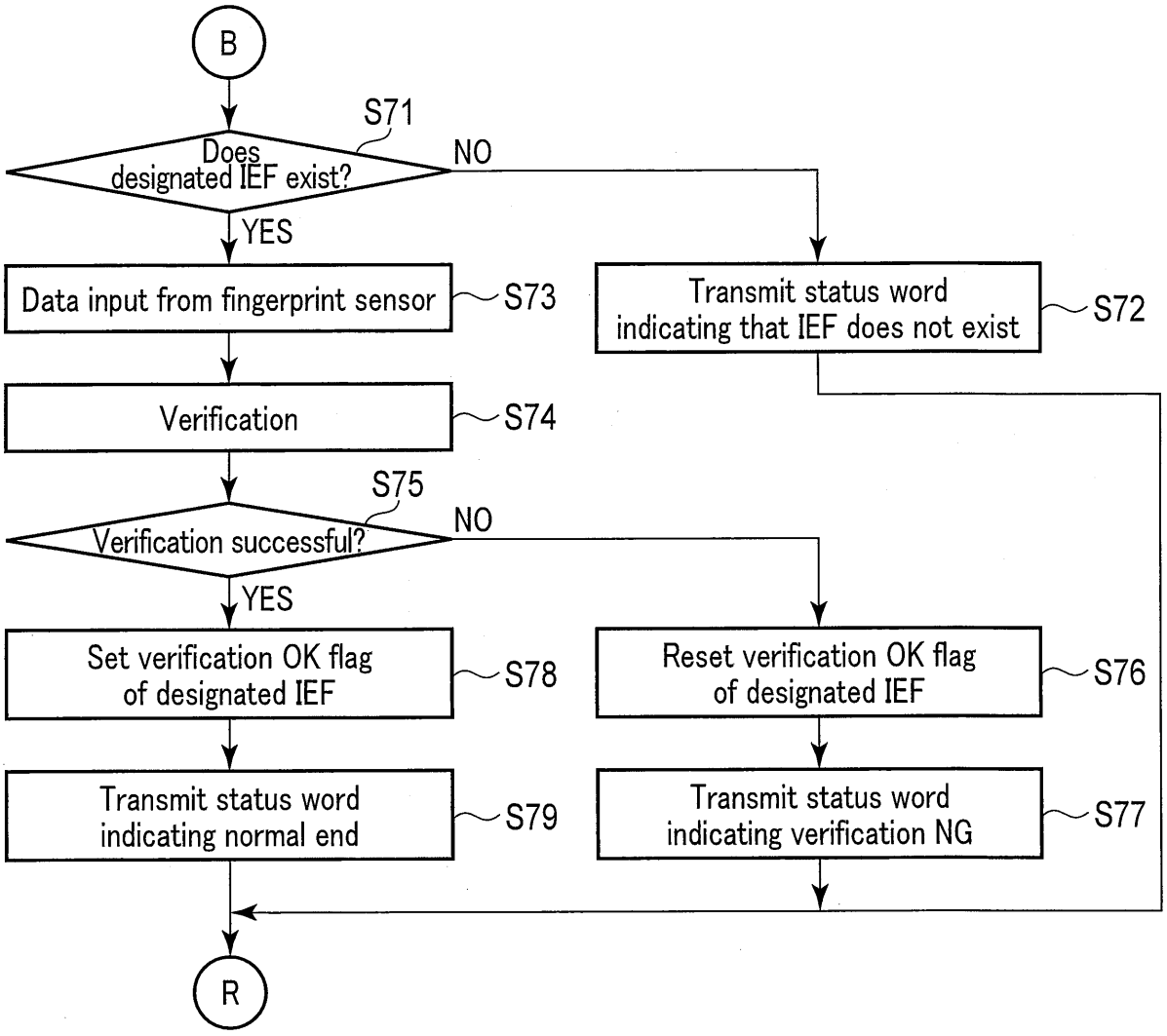

FIG. 20

IEF	Verification state	Meaning
01	00	Unverified
02	01	Verified
03	00	Unverified
04	00	Unverified
⋮	⋮	⋮

FIG. 21

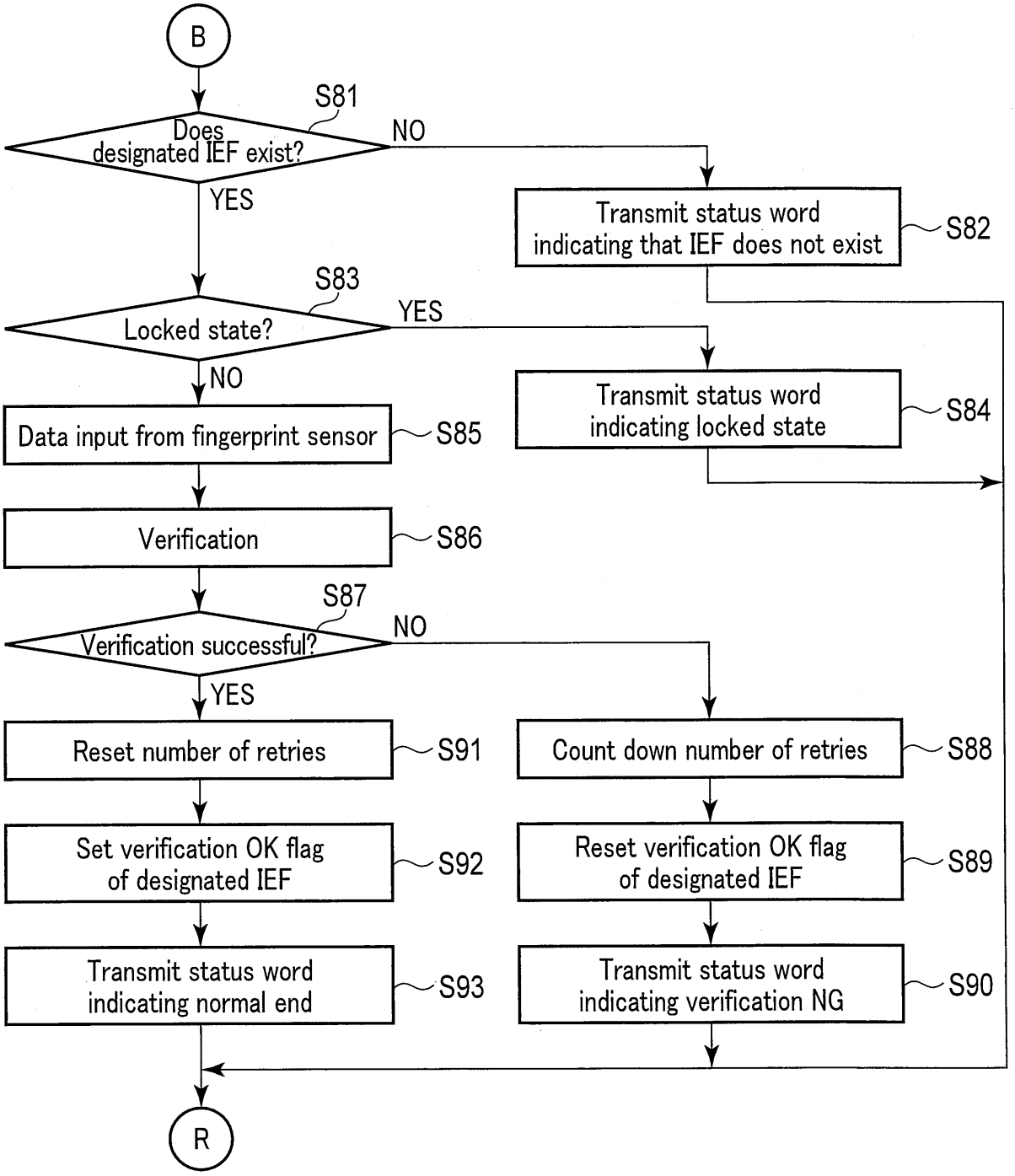
B
S81
Does designated IEF exist?
NO
YES
Transmit status word indicating that IEF does not exist
S82
S83
Locked state?
YES
NO
Transmit status word indicating locked state
S84
Data input from fingerprint sensor
S85
Verification
S86
S87
Verification successful?
NO
YES
Reset number of retries
S91
Count down number of retries
S88
Set verification OK flag of designated IEF
S92
Reset verification OK flag of designated IEF
S89
Transmit status word indicating normal end
S93
Transmit status word indicating verification NG
S90
R

FIG. 22

IEF	Fingerprint registration data	Length	Retry counter	Retry counter initial value
01	Fingerprint data 1	xx byte	08	10
02	Fingerprint data 2	xx byte	04	05
03	Fingerprint data 3	xx byte	20	20
04	Fingerprint data 4	xx byte	16	20
⋮	⋮	⋮		

FIG. 23

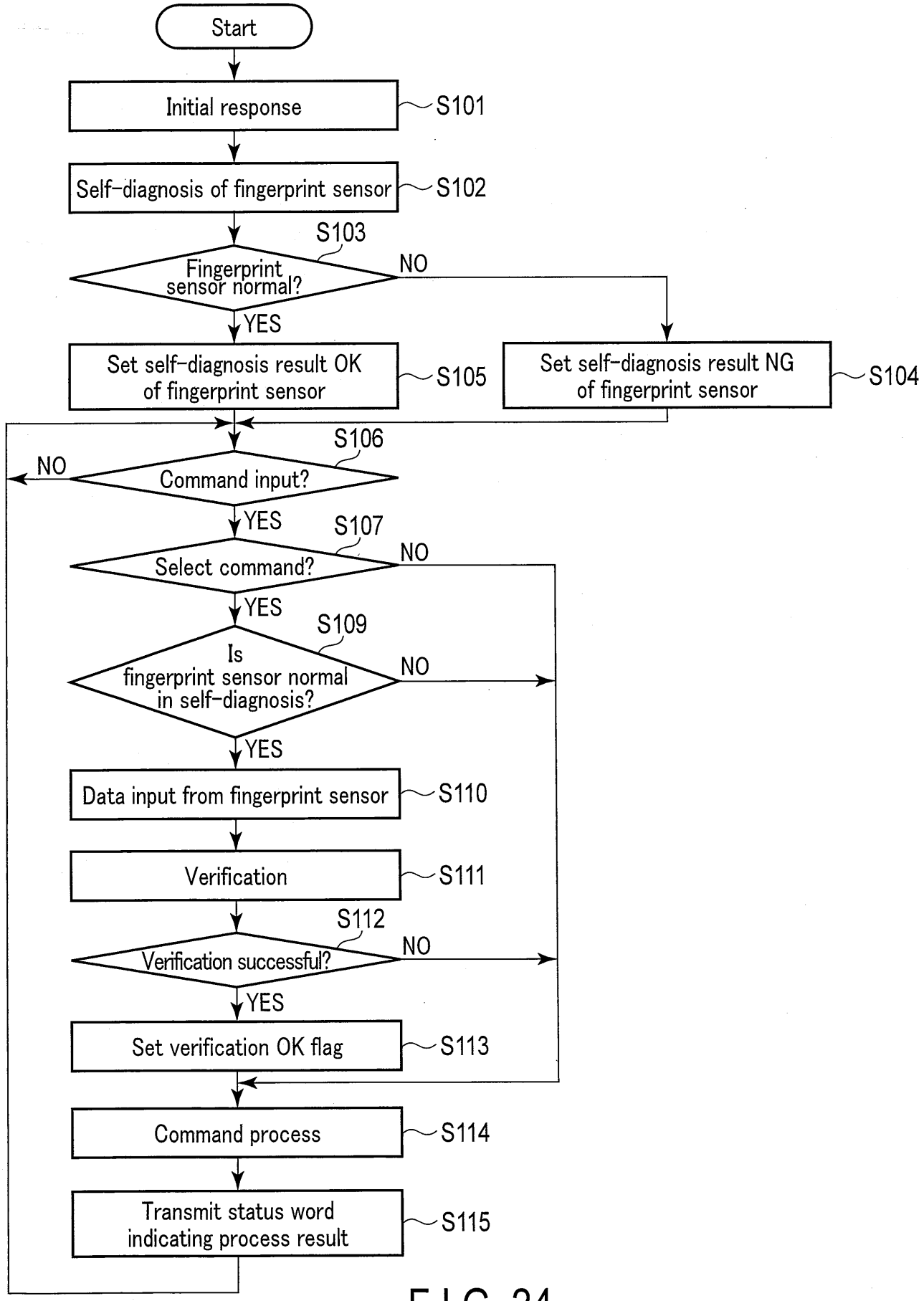
Start
Initial response
S101
Self-diagnosis of fingerprint sensor
S102
S103
Fingerprint sensor normal?
NO
YES
Set self-diagnosis result OK of fingerprint sensor
S105
Set self-diagnosis result NG of fingerprint sensor
S104
S106
NO
Command input?
YES
S107
Select command?
NO
YES
S109
Is fingerprint sensor normal in self-diagnosis?
NO
YES
Data input from fingerprint sensor
S110
Verification
S111
S112
Verification successful?
NO
YES
Set verification OK flag
S113
Command process
S114
Transmit status word indicating process result
S115

FIG. 24

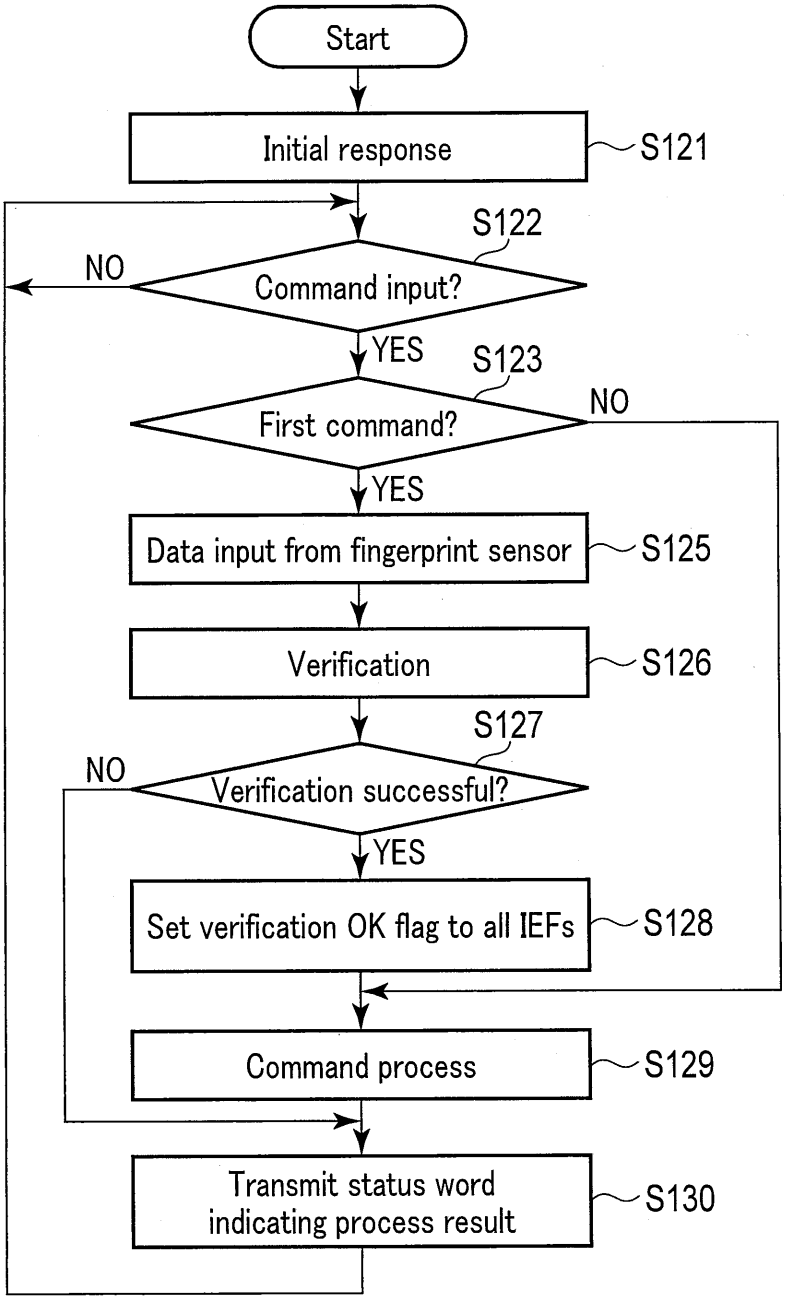
Start
Initial response
S121
S122
NO
Command input?
YES
S123
First command?
NO
YES
Data input from fingerprint sensor
S125
Verification
S126
S127
NO
Verification successful?
YES
Set verification OK flag to all IEFs
S128
Command process
S129
Transmit status word indicating process result
S130

FIG. 25

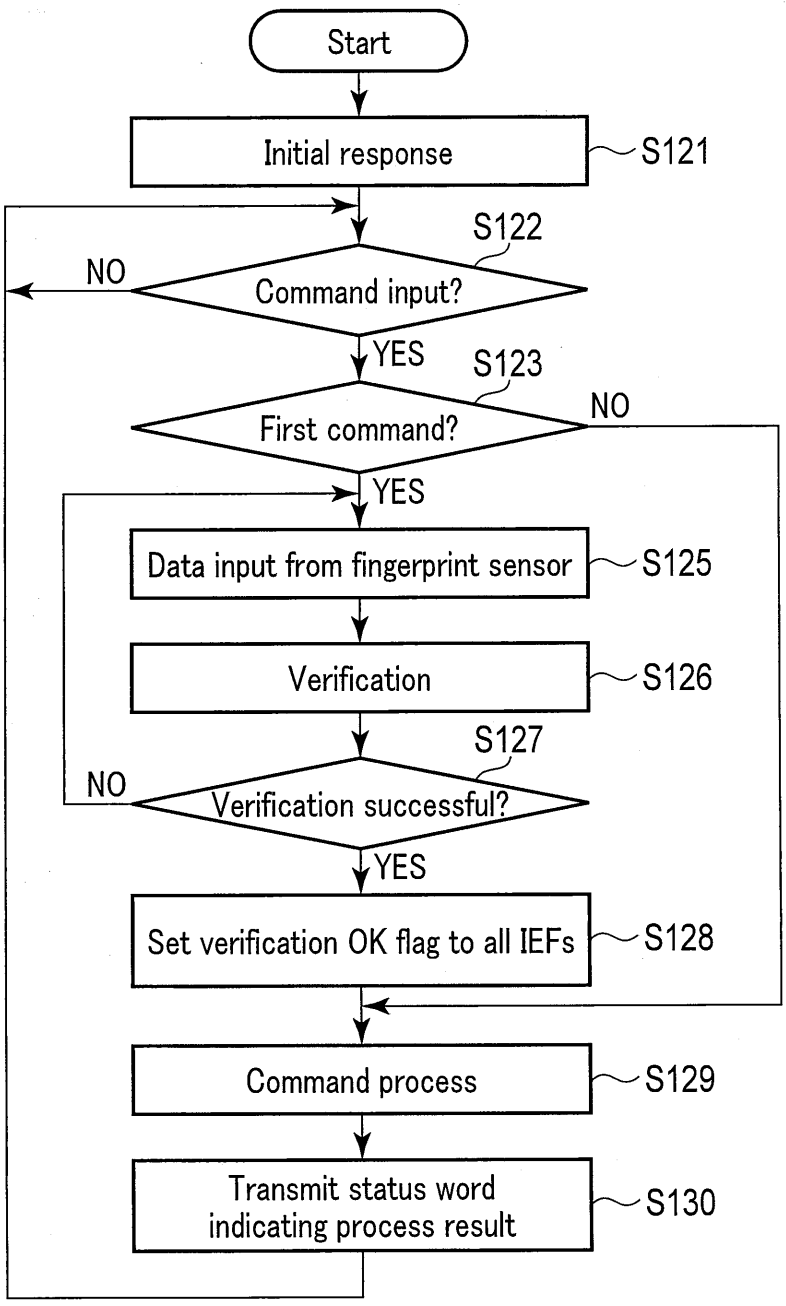
Start
Initial response
S121
S122
Command input?
NO
YES
S123
First command?
NO
YES
Data input from fingerprint sensor
S125
Verification
S126
S127
Verification successful?
NO
YES
Set verification OK flag to all IEFs
S128
Command process
S129
Transmit status word indicating process result
S130

FIG. 26

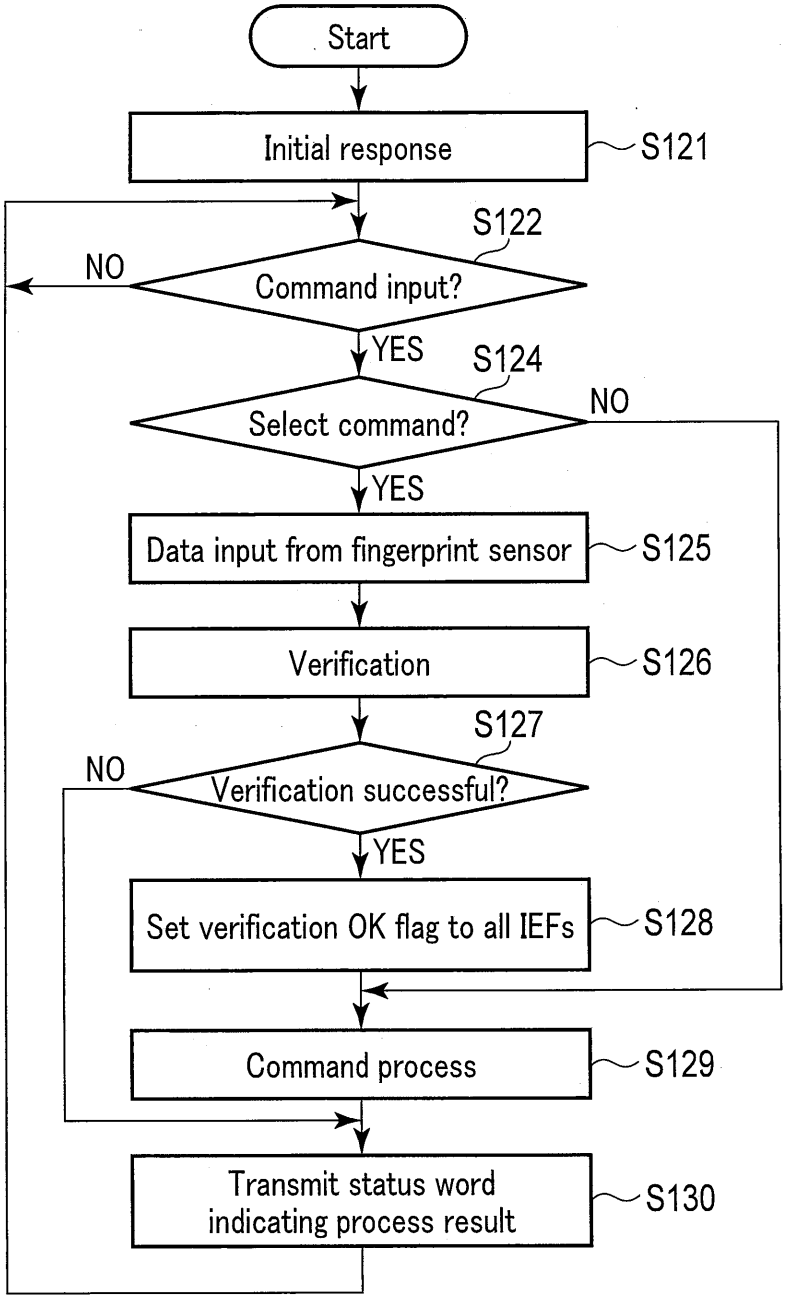
Start
Initial response
S121
S122
NO
Command input?
YES
S124
Select command?
NO
YES
Data input from fingerprint sensor
S125
Verification
S126
S127
NO
Verification successful?
YES
Set verification OK flag to all IEFs
S128
Command process
S129
Transmit status word indicating process result
S130

FIG. 27

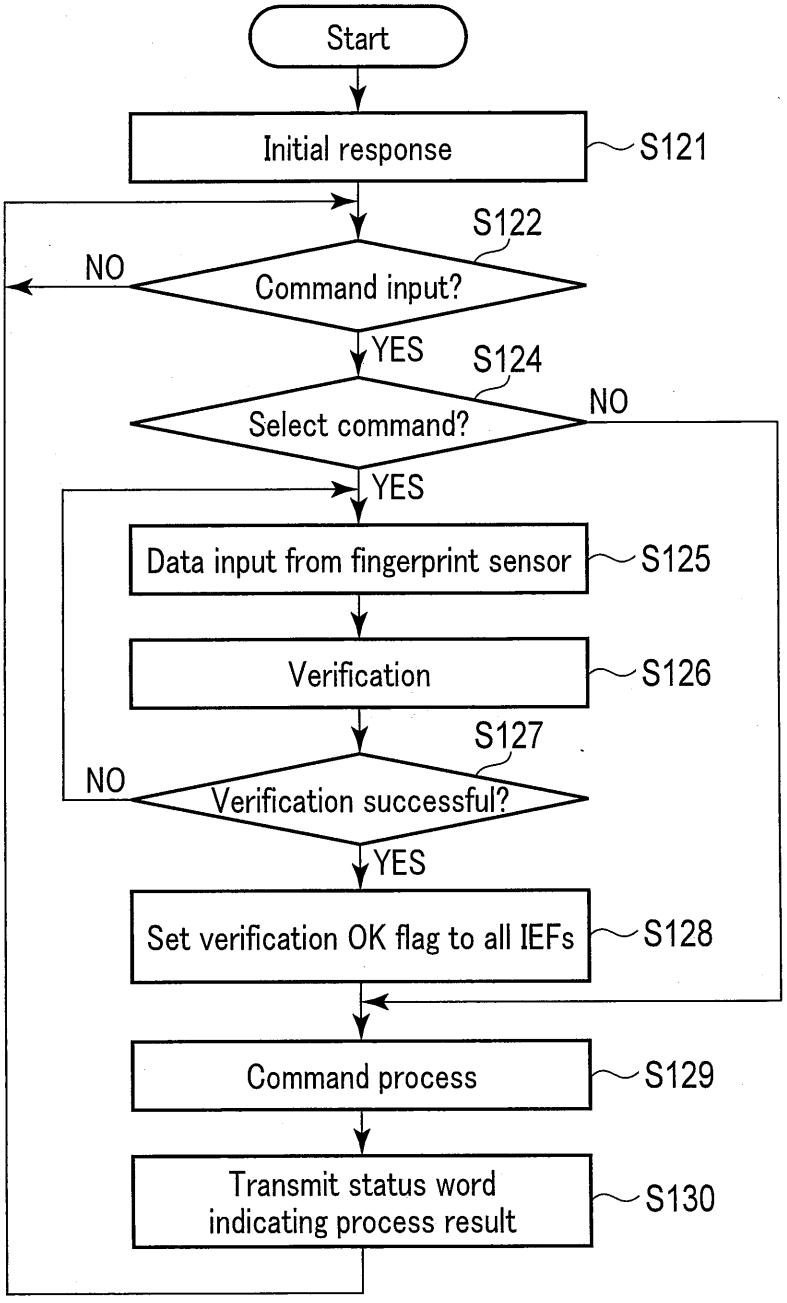
Start
Initial response
S121
S122
Command input?
NO
YES
S124
Select command?
NO
YES
Data input from fingerprint sensor
S125
Verification
S126
S127
Verification successful?
NO
YES
Set verification OK flag to all IEFs
S128
Command process
S129
Transmit status word indicating process result
S130

FIG. 28

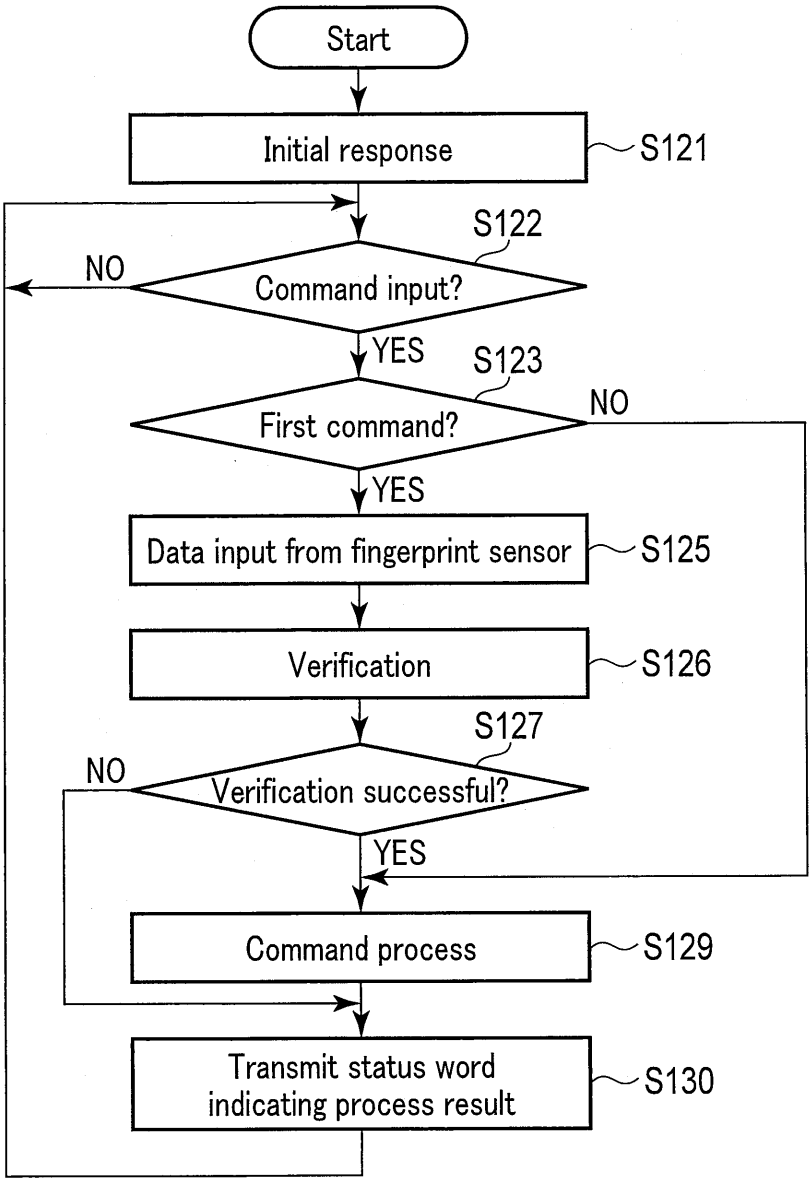
Start
Initial response
S121
S122
NO
Command input?
YES
S123
First command?
NO
YES
Data input from fingerprint sensor
S125
Verification
S126
S127
NO
Verification successful?
YES
Command process
S129
Transmit status word
indicating process result
S130

FIG. 29

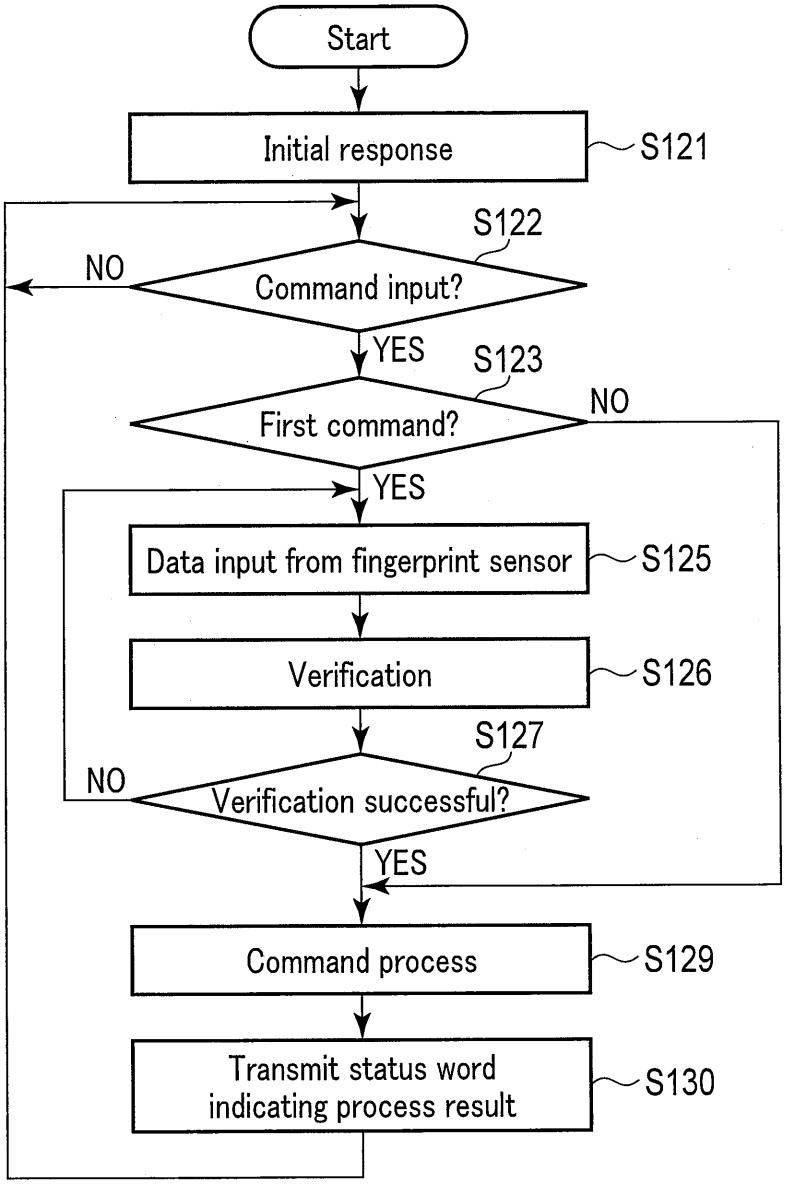
Start
Initial response
S121
S122
NO
Command input?
YES
S123
First command?
NO
YES
Data input from fingerprint sensor
S125
Verification
S126
S127
NO
Verification successful?
YES
Command process
S129
Transmit status word indicating process result
S130

FIG. 30

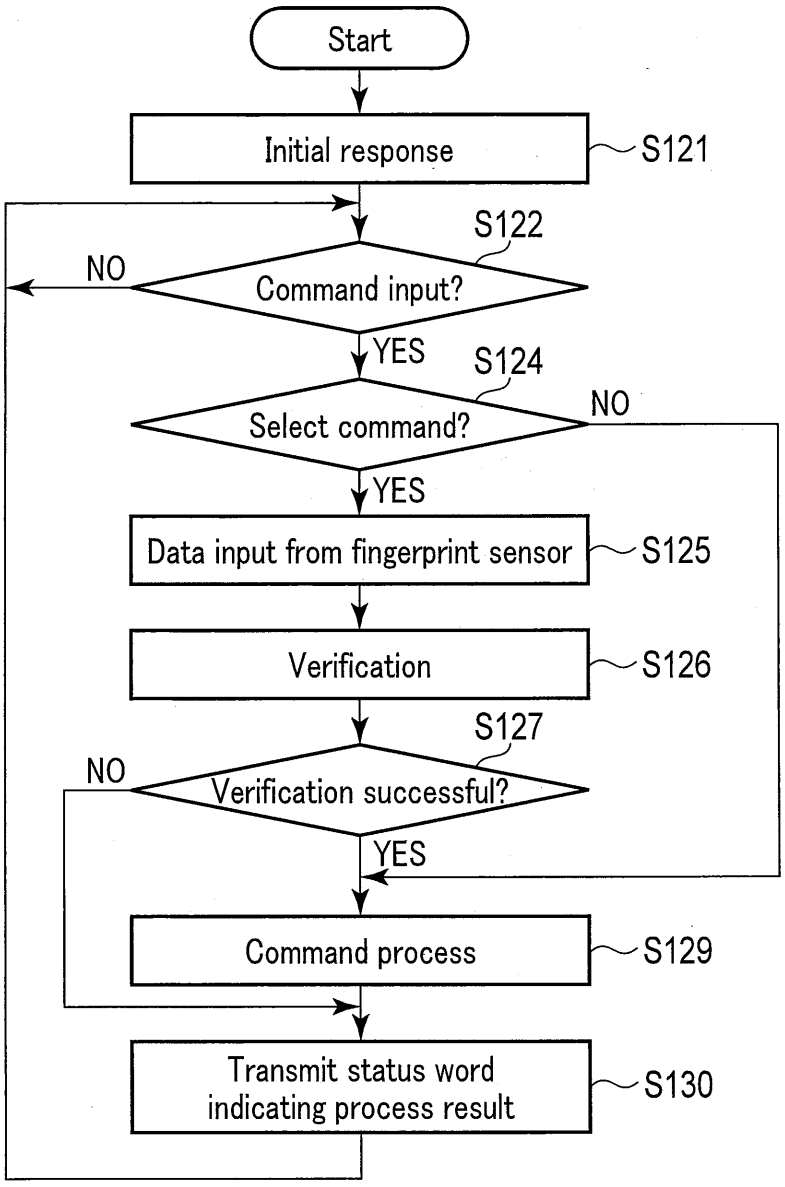
Start
Initial response
S121
S122
Command input?
NO
YES
S124
Select command?
NO
YES
Data input from fingerprint sensor
S125
Verification
S126
S127
Verification successful?
NO
YES
Command process
S129
Transmit status word indicating process result
S130

FIG. 31

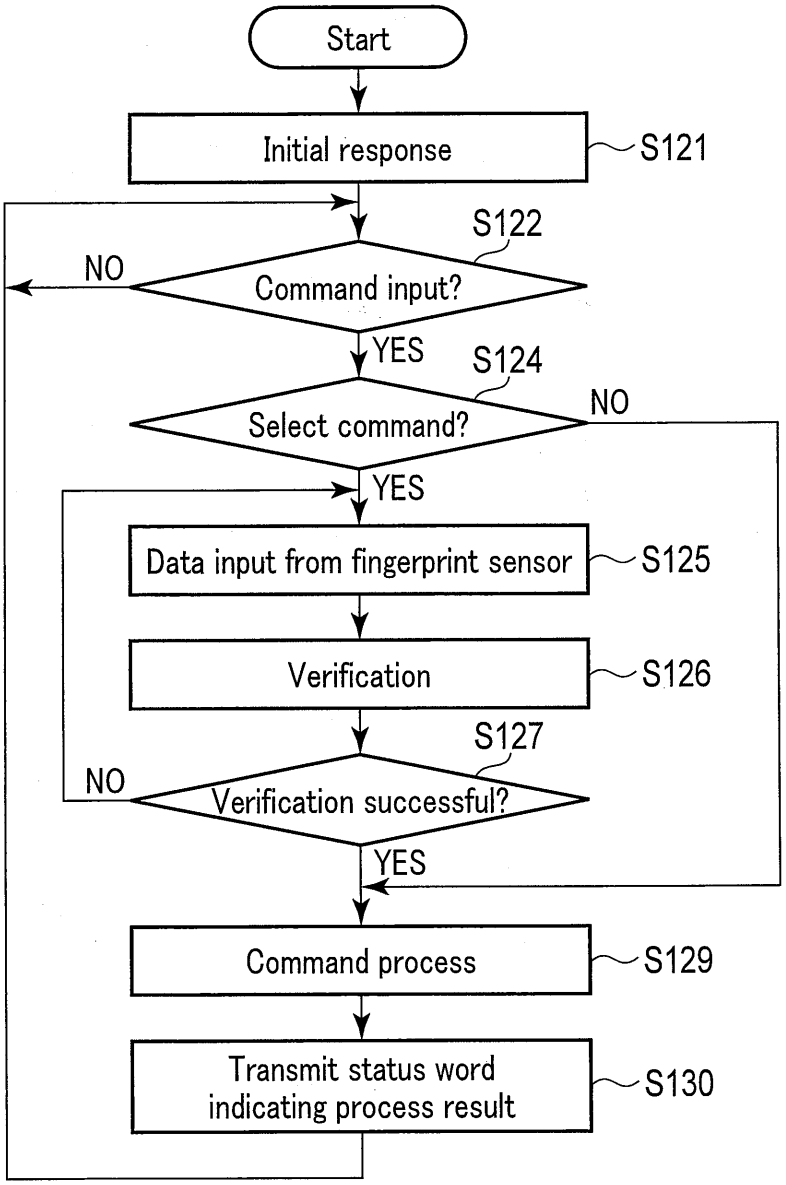
Start
Initial response
S121
S122
NO
Command input?
YES
S124
Select command?
NO
YES
Data input from fingerprint sensor
S125
Verification
S126
S127
NO
Verification successful?
YES
Command process
S129
Transmit status word indicating process result
S130

FIG. 32