FIG.1

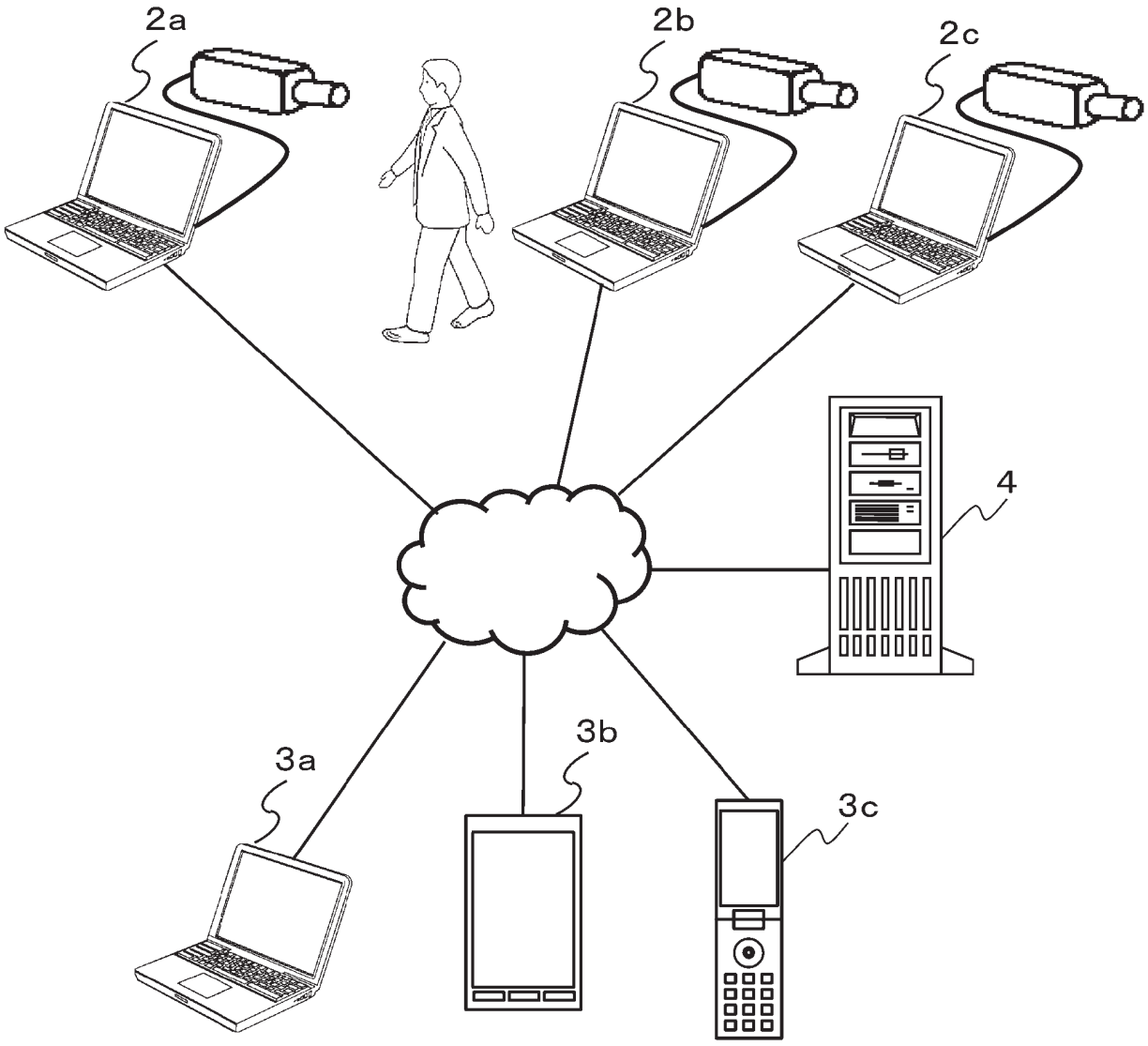


FIG.2

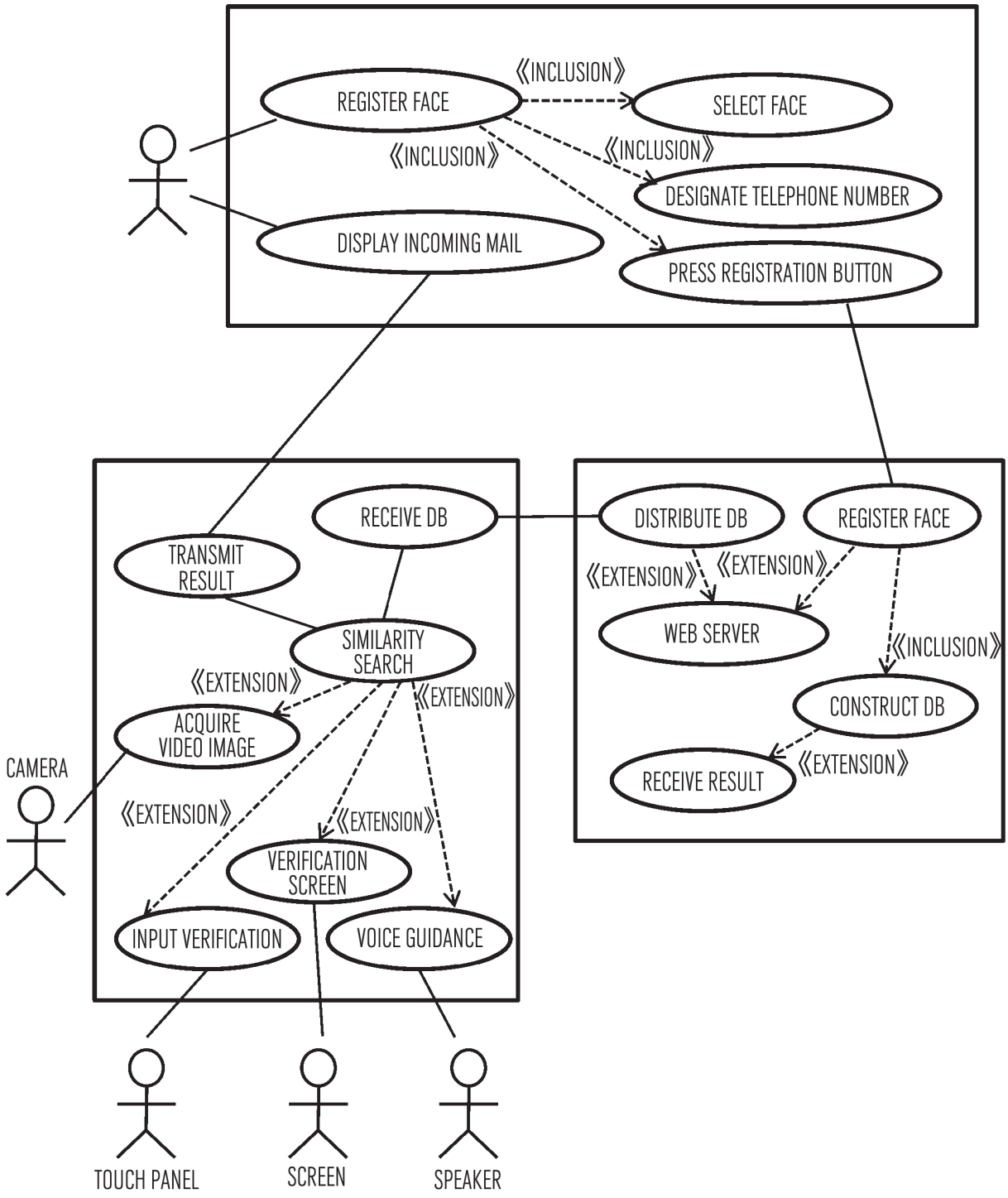

REGISTER FACE
《INCLUSION》
SELECT FACE
《INCLUSION》
《INCLUSION》
DESIGNATE TELEPHONE NUMBER
DISPLAY INCOMING MAIL
PRESS REGISTRATION BUTTON
RECEIVE DB
TRANSMIT RESULT
SIMILARITY SEARCH
《EXTENSION》
《EXTENSION》
ACQUIRE VIDEO IMAGE
CAMERA
《EXTENSION》
《EXTENSION》
VERIFICATION SCREEN
INPUT VERIFICATION
VOICE GUIDANCE
TOUCH PANEL
SCREEN
SPEAKER
DISTRIBUTE DB
REGISTER FACE
《EXTENSION》
《EXTENSION》
WEB SERVER
《INCLUSION》
CONSTRUCT DB
RECEIVE RESULT
《EXTENSION》

FIG.3

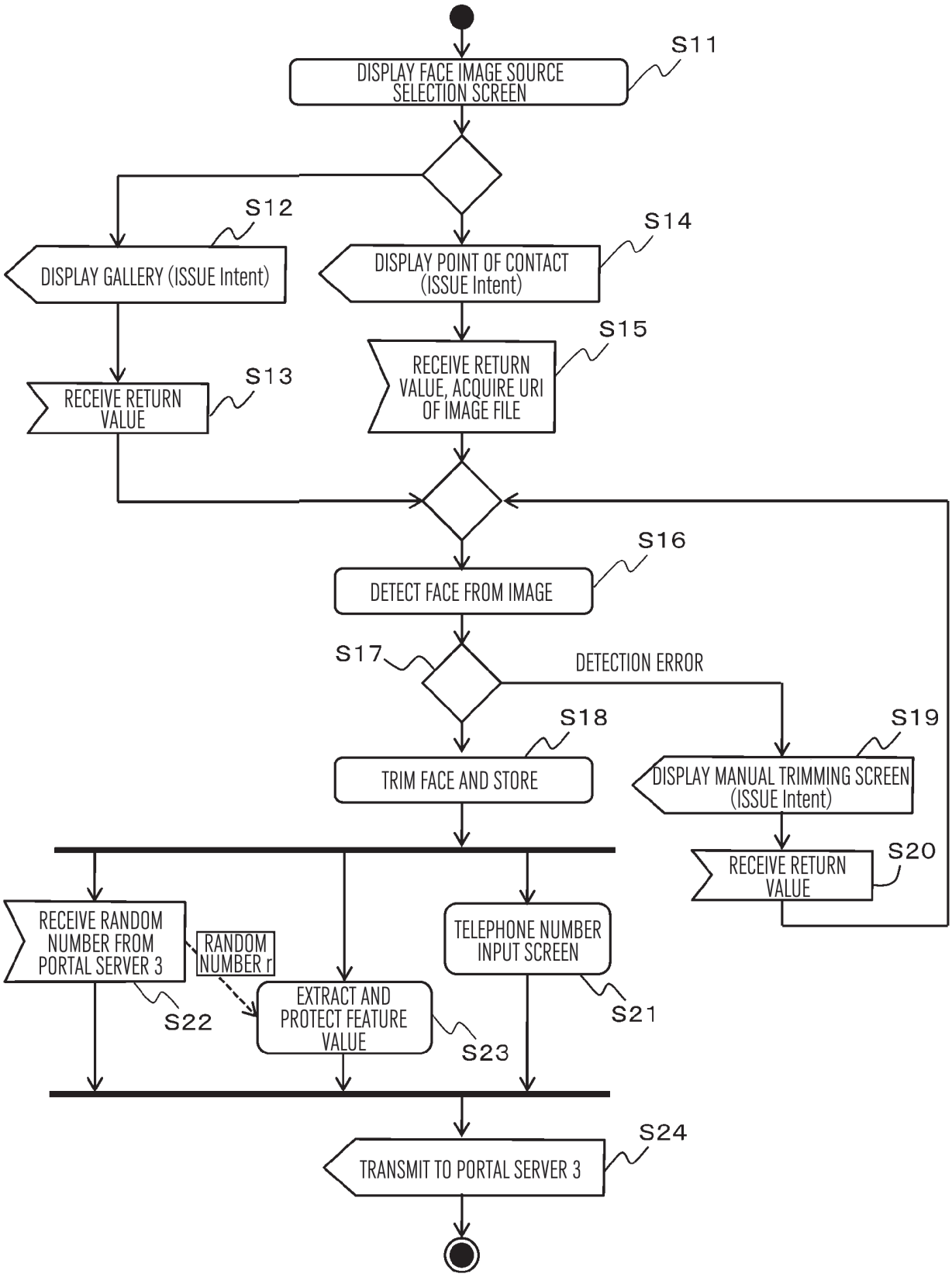

S11
DISPLAY FACE IMAGE SOURCE SELECTION SCREEN
S12
DISPLAY GALLERY (ISSUE Intent)
S14
DISPLAY POINT OF CONTACT (ISSUE Intent)
S15
RECEIVE RETURN VALUE, ACQUIRE URI OF IMAGE FILE
S13
RECEIVE RETURN VALUE
S16
DETECT FACE FROM IMAGE
S17
DETECTION ERROR
S18
TRIM FACE AND STORE
S19
DISPLAY MANUAL TRIMMING SCREEN (ISSUE Intent)
S20
RECEIVE RETURN VALUE
RECEIVE RANDOM NUMBER FROM PORTAL SERVER 3
RANDOM NUMBER r
S22
EXTRACT AND PROTECT FEATURE VALUE
S23
TELEPHONE NUMBER INPUT SCREEN
S21
S24
TRANSMIT TO PORTAL SERVER 3

FIG.4

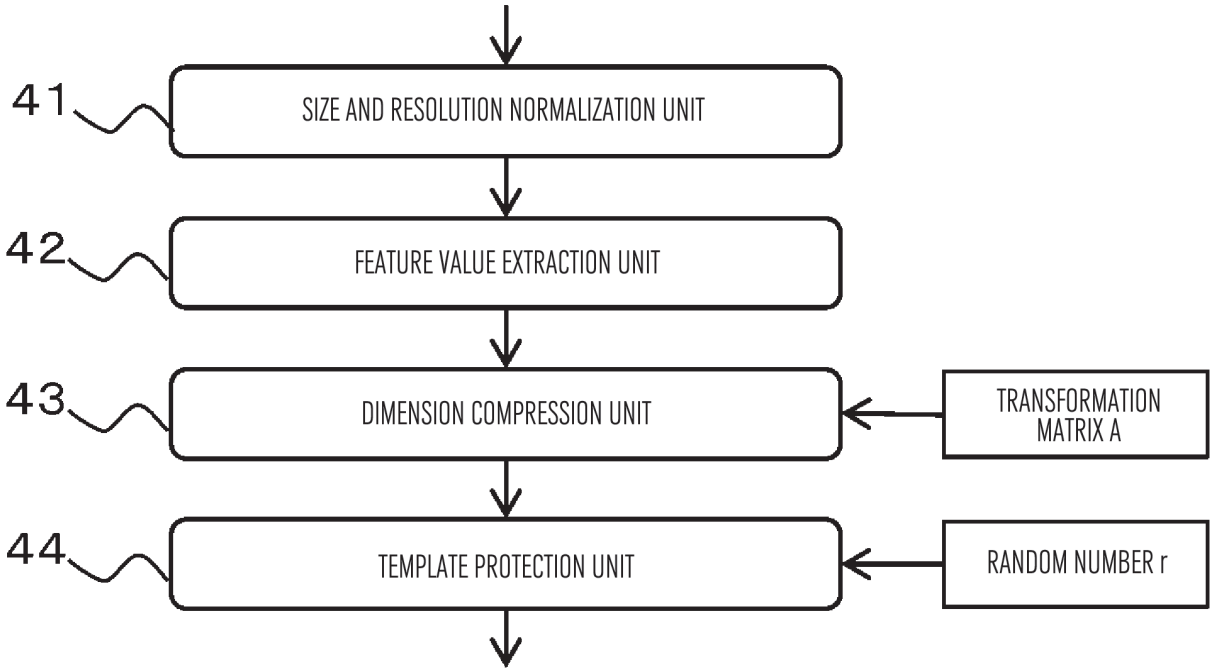
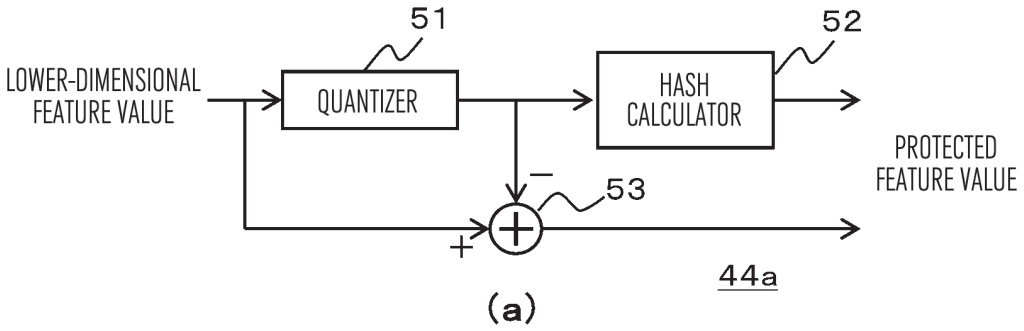
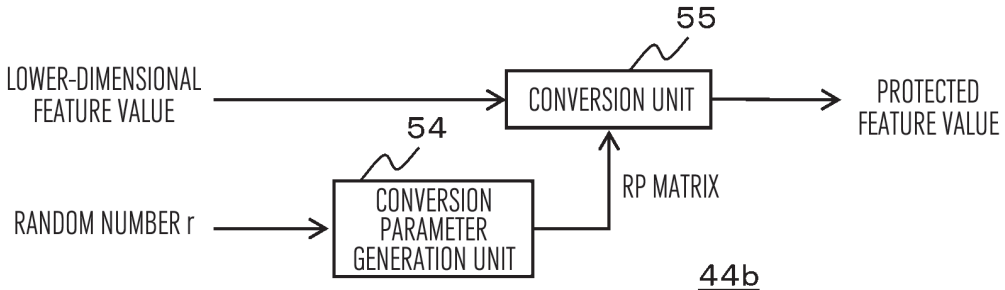

41
SIZE AND RESOLUTION NORMALIZATION UNIT
42
FEATURE VALUE EXTRACTION UNIT
43
DIMENSION COMPRESSION UNIT
TRANSFORMATION MATRIX A
44
TEMPLATE PROTECTION UNIT
RANDOM NUMBER r

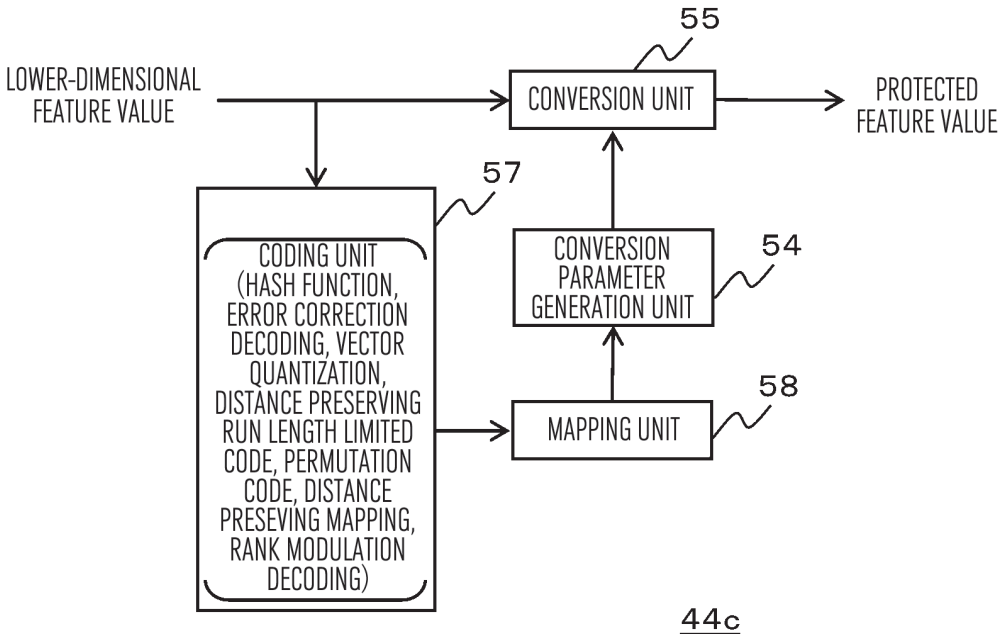
FIG.5


51
52
LOWER-DIMENSIONAL FEATURE VALUE
QUANTIZER
HASH CALCULATOR
PROTECTED FEATURE VALUE
−
53
+
44a

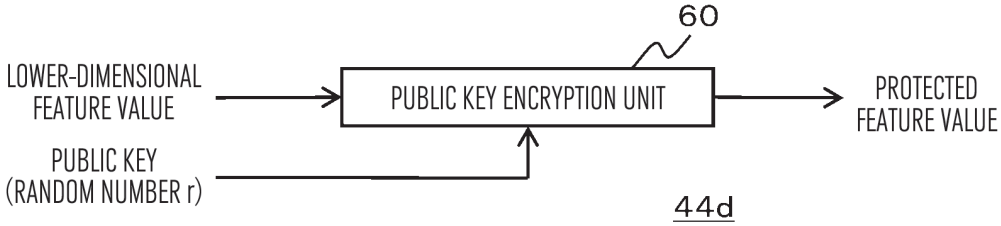
(a)


55
LOWER-DIMENSIONAL FEATURE VALUE
CONVERSION UNIT
PROTECTED FEATURE VALUE
54
RP MATRIX
RANDOM NUMBER r
CONVERSION PARAMETER GENERATION UNIT
44b

(b)


55
LOWER-DIMENSIONAL FEATURE VALUE
CONVERSION UNIT
PROTECTED FEATURE VALUE
57
CODING UNIT (HASH FUNCTION, ERROR CORRECTION DECODING, VECTOR QUANTIZATION, DISTANCE PRESERVING RUN LENGTH LIMITED CODE, PERMUTATION CODE, DISTANCE PRESEVING MAPPING, RANK MODULATION DECODING)
CONVERSION PARAMETER GENERATION UNIT
54
58
MAPPING UNIT
44c

(c)


60
LOWER-DIMENSIONAL FEATURE VALUE
PUBLIC KEY ENCRYPTION UNIT
PROTECTED FEATURE VALUE
PUBLIC KEY (RANDOM NUMBER r)
44d

(d)

FIG.6

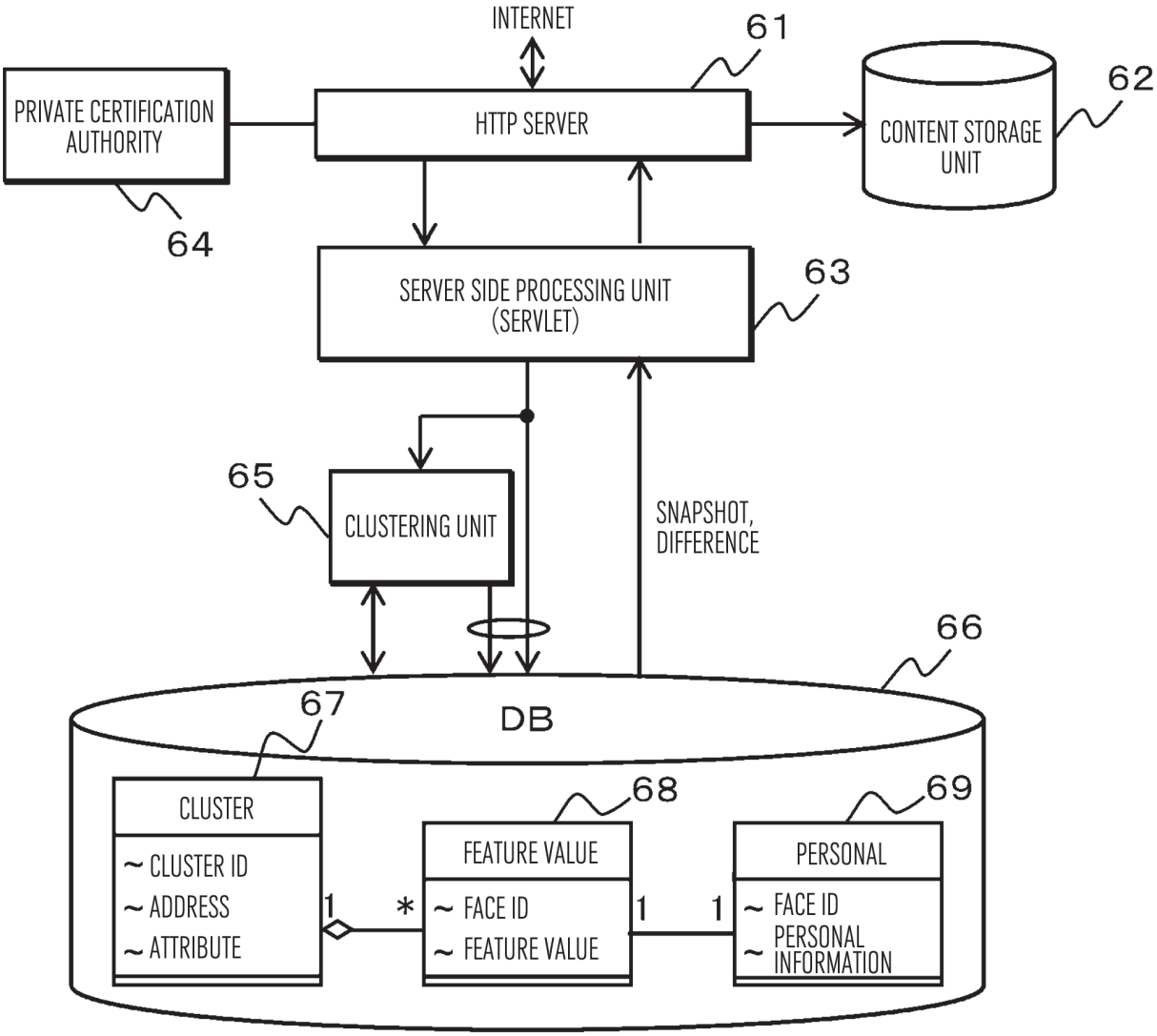
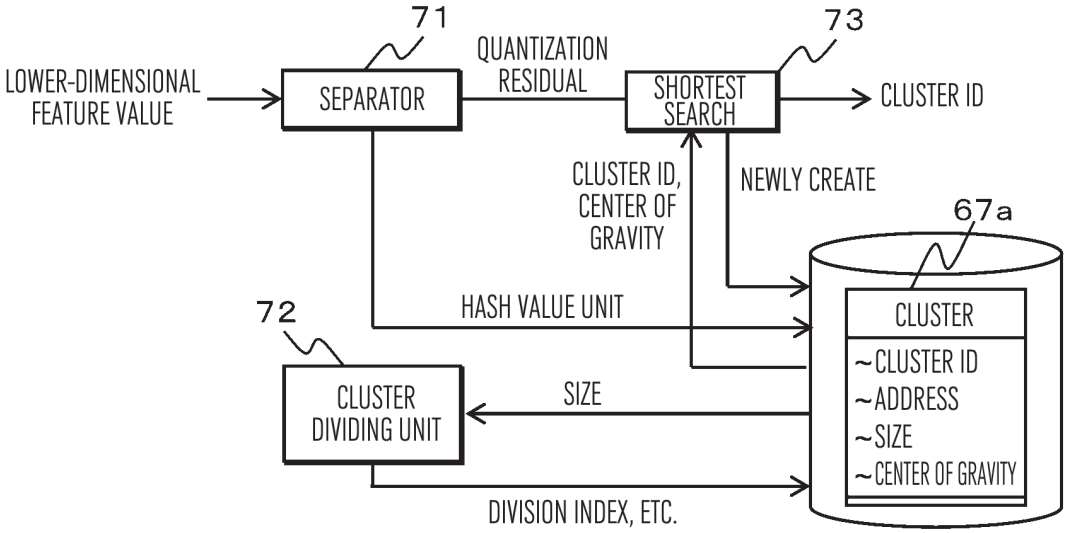
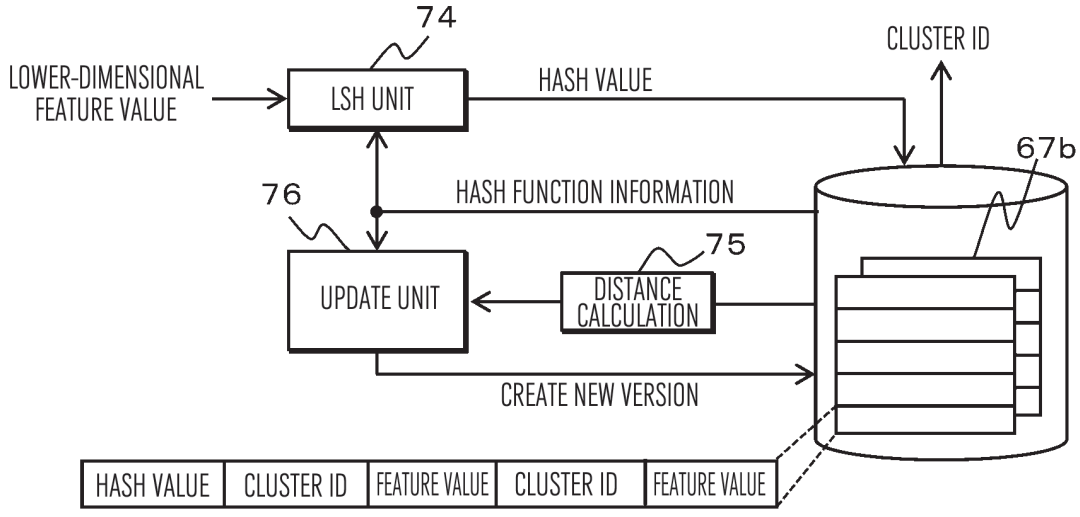

INTERNET
61
62
PRIVATE CERTIFICATION AUTHORITY
HTTP SERVER
CONTENT STORAGE UNIT
64
SERVER SIDE PROCESSING UNIT (SERVLET)
63
65
CLUSTERING UNIT
SNAPSHOT, DIFFERENCE
66
DB
67
CLUSTER
~ CLUSTER ID
~ ADDRESS
~ ATTRIBUTE
1
*
68
FEATURE VALUE
~ FACE ID
~ FEATURE VALUE
1
1
69
PERSONAL
~ FACE ID
~ PERSONAL INFORMATION

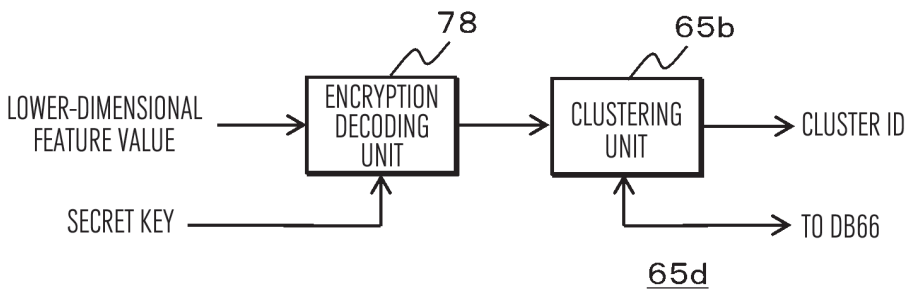
FIG.7


71
LOWER-DIMENSIONAL FEATURE VALUE
SEPARATOR
QUANTIZATION RESIDUAL
SHORTEST SEARCH
73
CLUSTER ID
CLUSTER ID, CENTER OF GRAVITY
NEWLY CREATE
67a
CLUSTER
~CLUSTER ID
~ADDRESS
~SIZE
~CENTER OF GRAVITY
72
HASH VALUE UNIT
CLUSTER DIVIDING UNIT
SIZE
DIVISION INDEX, ETC.

(a)


74
LOWER-DIMENSIONAL FEATURE VALUE
LSH UNIT
HASH VALUE
CLUSTER ID
67b
76
HASH FUNCTION INFORMATION
75
UPDATE UNIT
DISTANCE CALCULATION
CREATE NEW VERSION
HASH VALUE
CLUSTER ID
FEATURE VALUE
CLUSTER ID
FEATURE VALUE

(b)


78
65b
LOWER-DIMENSIONAL FEATURE VALUE
ENCRYPTION DECODING UNIT
CLUSTERING UNIT
CLUSTER ID
SECRET KEY
TO DB66
65d

(c)

FIG.8

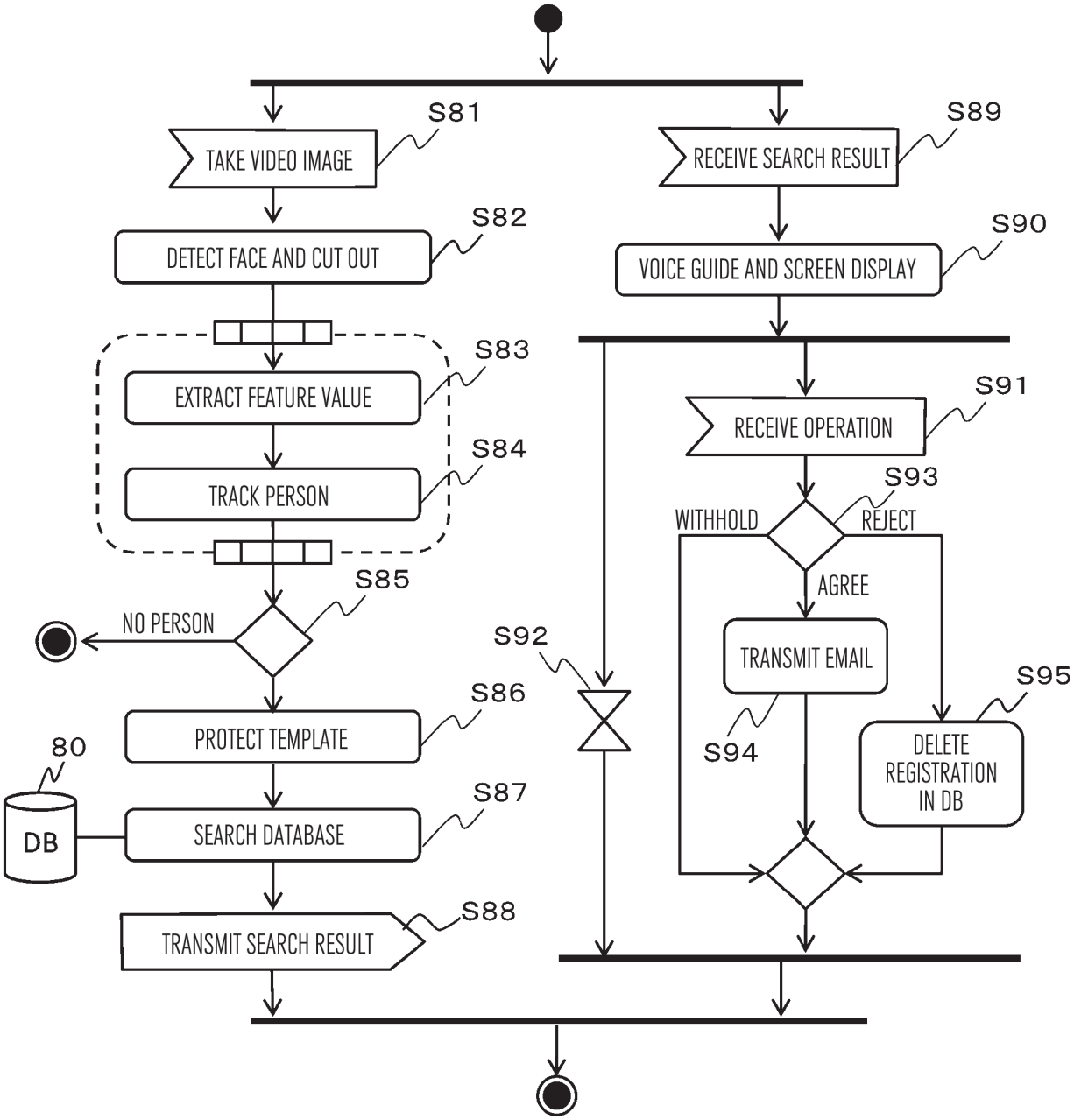
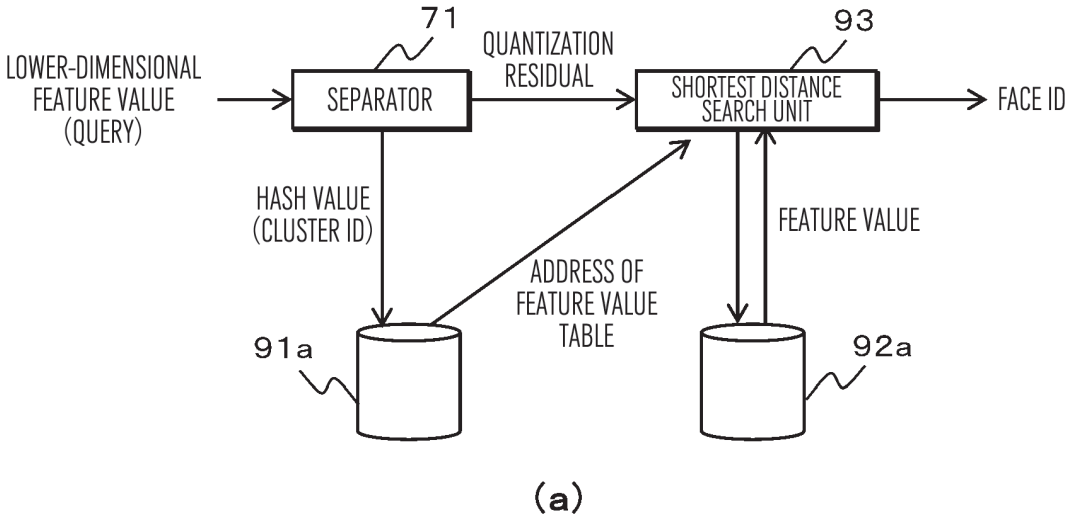
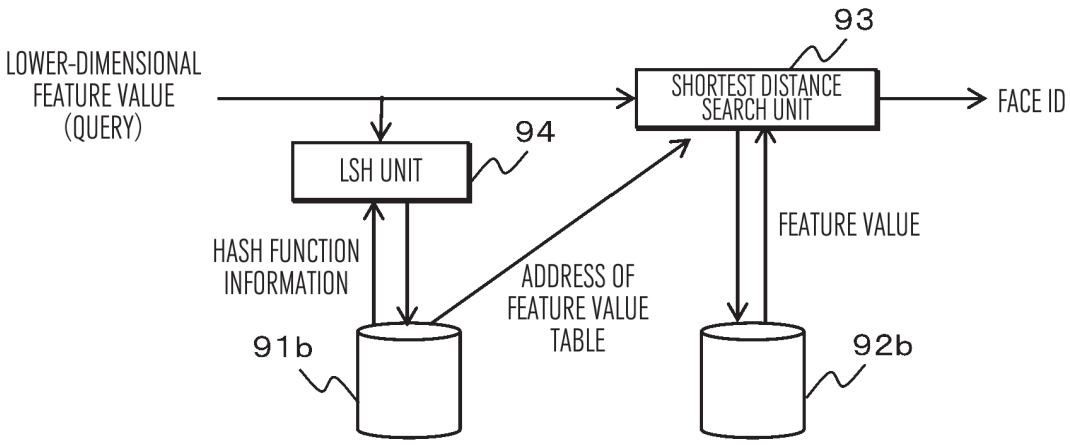

S81
TAKE VIDEO IMAGE
S82
DETECT FACE AND CUT OUT
S83
EXTRACT FEATURE VALUE
S84
TRACK PERSON
S85
NO PERSON
S86
PROTECT TEMPLATE
80
DB
S87
SEARCH DATABASE
S88
TRANSMIT SEARCH RESULT
S89
RECEIVE SEARCH RESULT
S90
VOICE GUIDE AND SCREEN DISPLAY
S91
RECEIVE OPERATION
S93
WITHHOLD
REJECT
AGREE
S92
TRANSMIT EMAIL
S94
S95
DELETE REGISTRATION IN DB

FIG.9


71
93
LOWER-DIMENSIONAL FEATURE VALUE (QUERY)
SEPARATOR
QUANTIZATION RESIDUAL
SHORTEST DISTANCE SEARCH UNIT
FACE ID
HASH VALUE (CLUSTER ID)
FEATURE VALUE
ADDRESS OF FEATURE VALUE TABLE
91a
92a

(a)


93
LOWER-DIMENSIONAL FEATURE VALUE (QUERY)
SHORTEST DISTANCE SEARCH UNIT
FACE ID
94
LSH UNIT
FEATURE VALUE
HASH FUNCTION INFORMATION
ADDRESS OF FEATURE VALUE TABLE
91b
92b

(b)

FIG.10

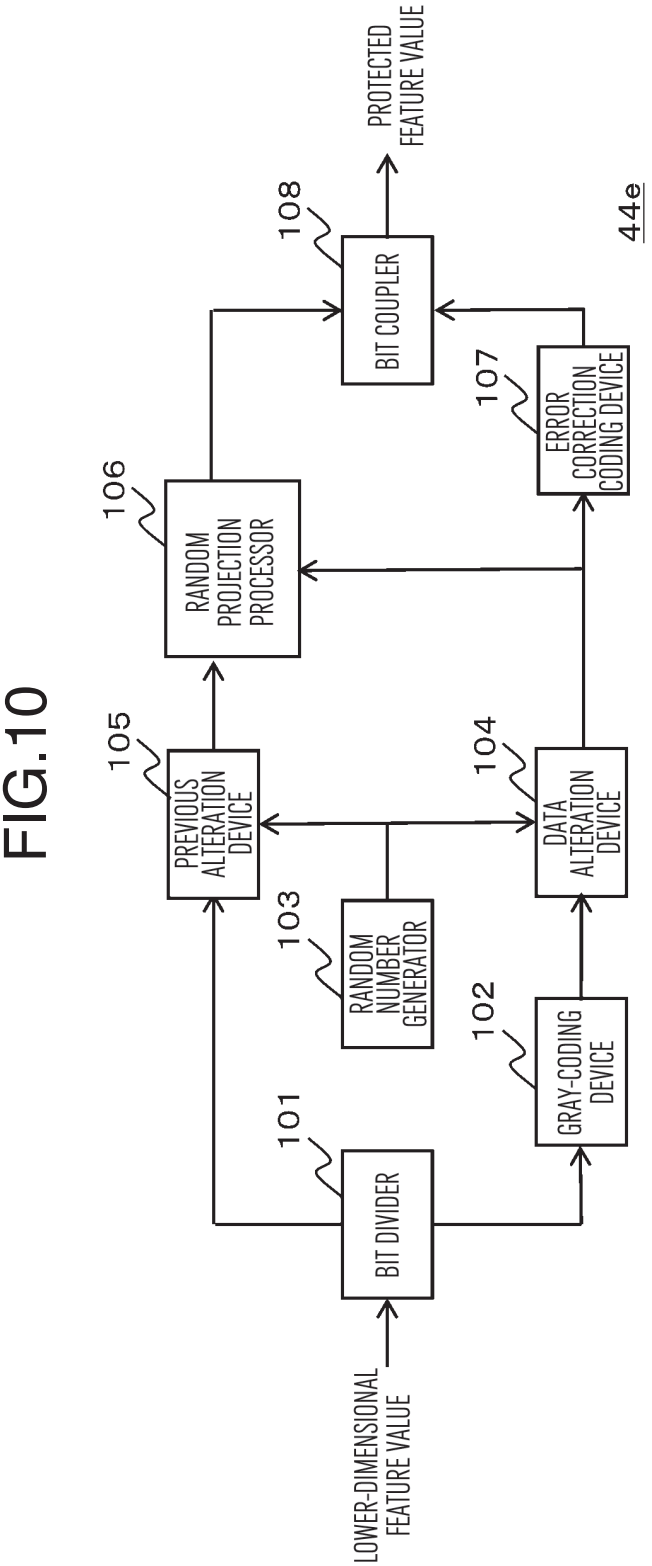

LOWER-DIMENSIONAL FEATURE VALUE
BIT DIVIDER
101
GRAY-CODING DEVICE
102
RANDOM NUMBER GENERATOR
103
DATA ALTERATION DEVICE
104
PREVIOUS ALTERATION DEVICE
105
RANDOM PROJECTION PROCESSOR
106
ERROR CORRECTION CODING DEVICE
107
BIT COUPLER
108
PROTECTED FEATURE VALUE
44e

FIG.11

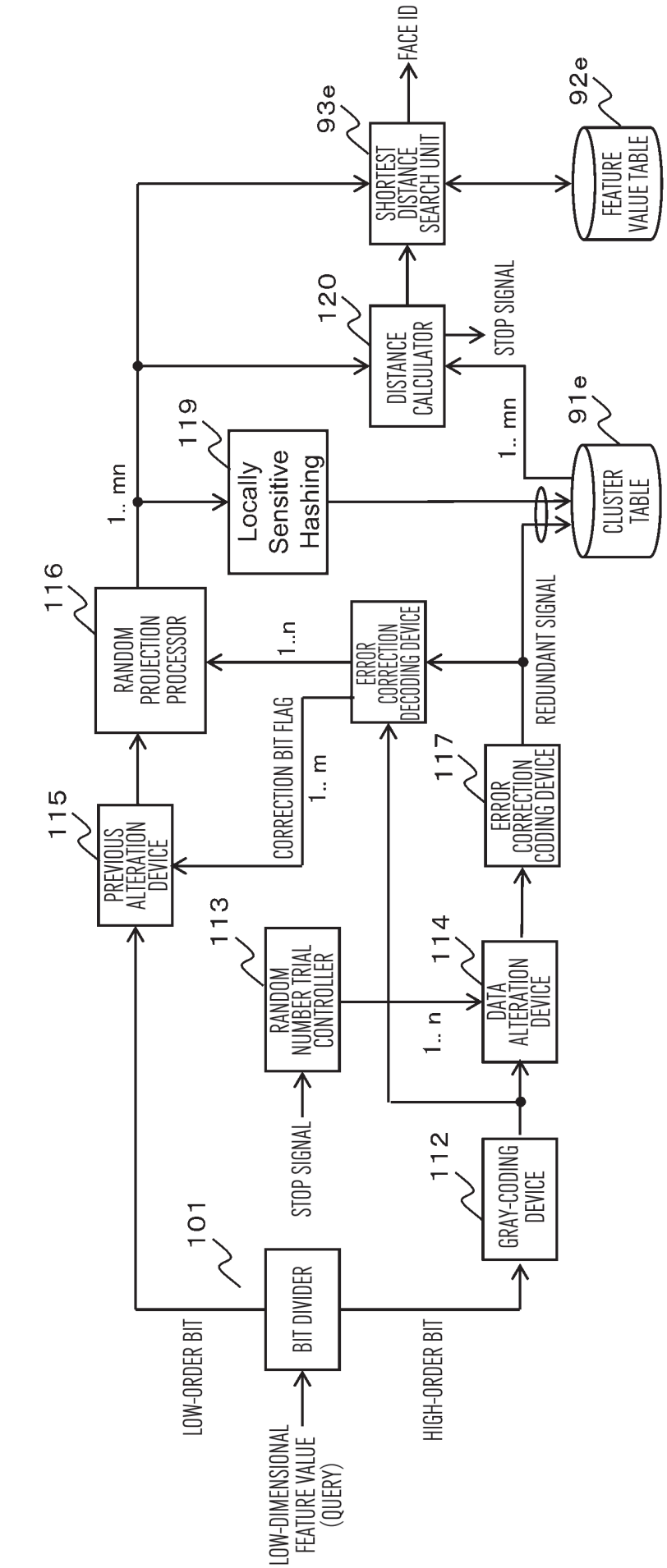
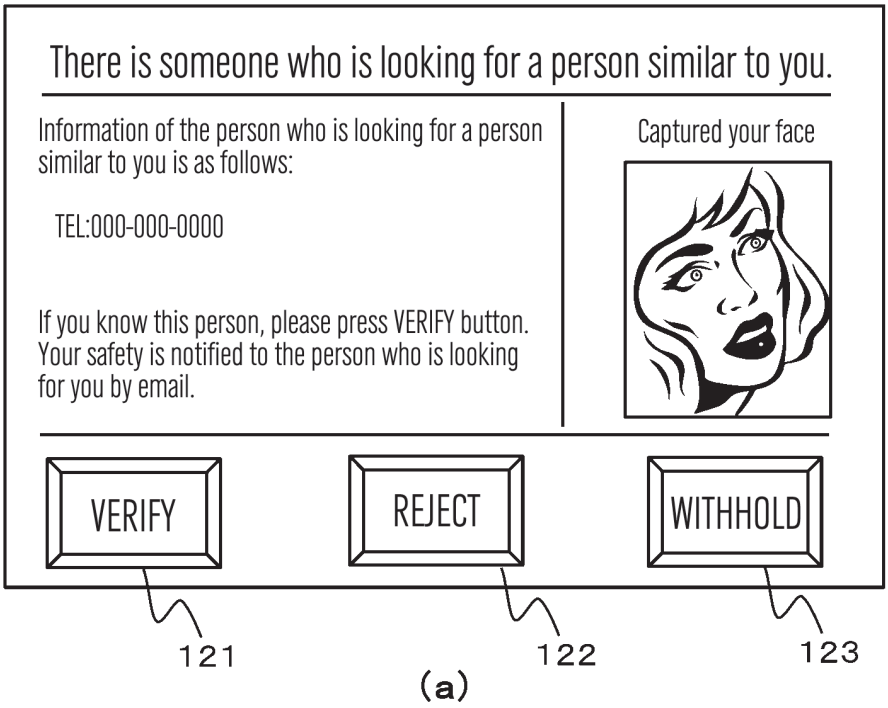
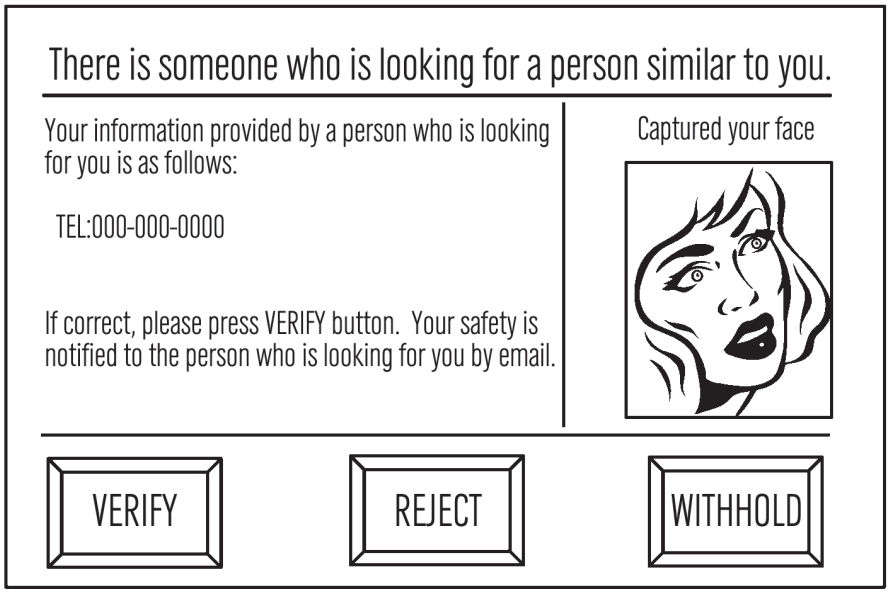

LOW-DIMENSIONAL FEATURE VALUE (QUERY)
BIT DIVIDER
101
LOW-ORDER BIT
HIGH-ORDER BIT
STOP SIGNAL
GRAY-CODING DEVICE
112
RANDOM NUMBER TRIAL CONTROLLER
113
DATA ALTERATION DEVICE
114
1.. n
PREVIOUS ALTERATION DEVICE
115
CORRECTION BIT FLAG
1.. m
ERROR CORRECTION CODING DEVICE
117
REDUNDANT SIGNAL
RANDOM PROJECTION PROCESSOR
116
1.. mn
ERROR CORRECTION DECODING DEVICE
1..n
Locally Sensitive Hashing
119
CLUSTER TABLE
91e
1.. mn
DISTANCE CALCULATOR
120
STOP SIGNAL
SHORTEST DISTANCE SEARCH UNIT
93e
FEATURE VALUE TABLE
92e
FACE ID

FIG.12


There is someone who is looking for a person similar to you.
Information of the person who is looking for a person similar to you is as follows:
TEL:000-000-0000
If you know this person, please press VERIFY button. Your safety is notified to the person who is looking for you by email.
Captured your face
VERIFY
REJECT
WITHHOLD
121
122
123

(a)


There is someone who is looking for a person similar to you.
Your information provided by a person who is looking for you is as follows:
TEL:000-000-0000
If correct, please press VERIFY button. Your safety is notified to the person who is looking for you by email.
Captured your face
VERIFY
REJECT
WITHHOLD

(b)