FIG.1

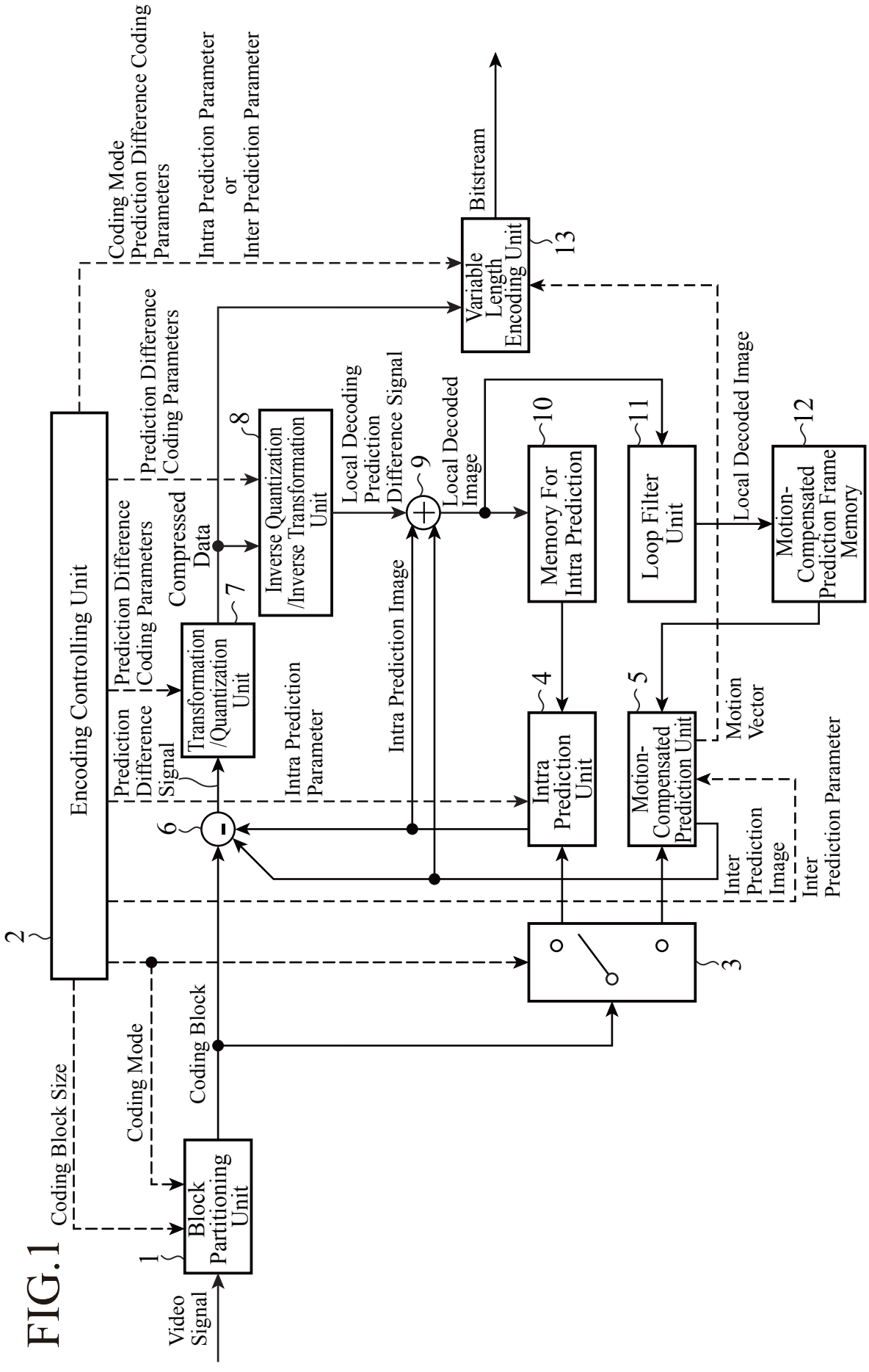

Video Signal
Block Partitioning Unit
1
Coding Block Size
Coding Mode
Coding Block
Encoding Controlling Unit
2
Coding Mode
Prediction Difference Coding Parameters
Intra Prediction Parameter or Inter Prediction Parameter
Prediction Difference Coding Parameters
Prediction Difference Signal
Transformation /Quantization Unit
7
Compressed Data
Inverse Quantization /Inverse Transformation Unit
8
Local Decoding Prediction Difference Signal
Local Decoded Image
9
Intra Prediction Image
Intra Prediction Parameter
Memory For Intra Prediction
10
Loop Filter Unit
11
Local Decoded Image
Motion-Compensated Prediction Frame Memory
12
Variable Length Encoding Unit
13
Bitstream
Intra Prediction Unit
4
Motion-Compensated Prediction Unit
5
Motion Vector
Inter Prediction Image
Inter Prediction Parameter
3
6

FIG.2

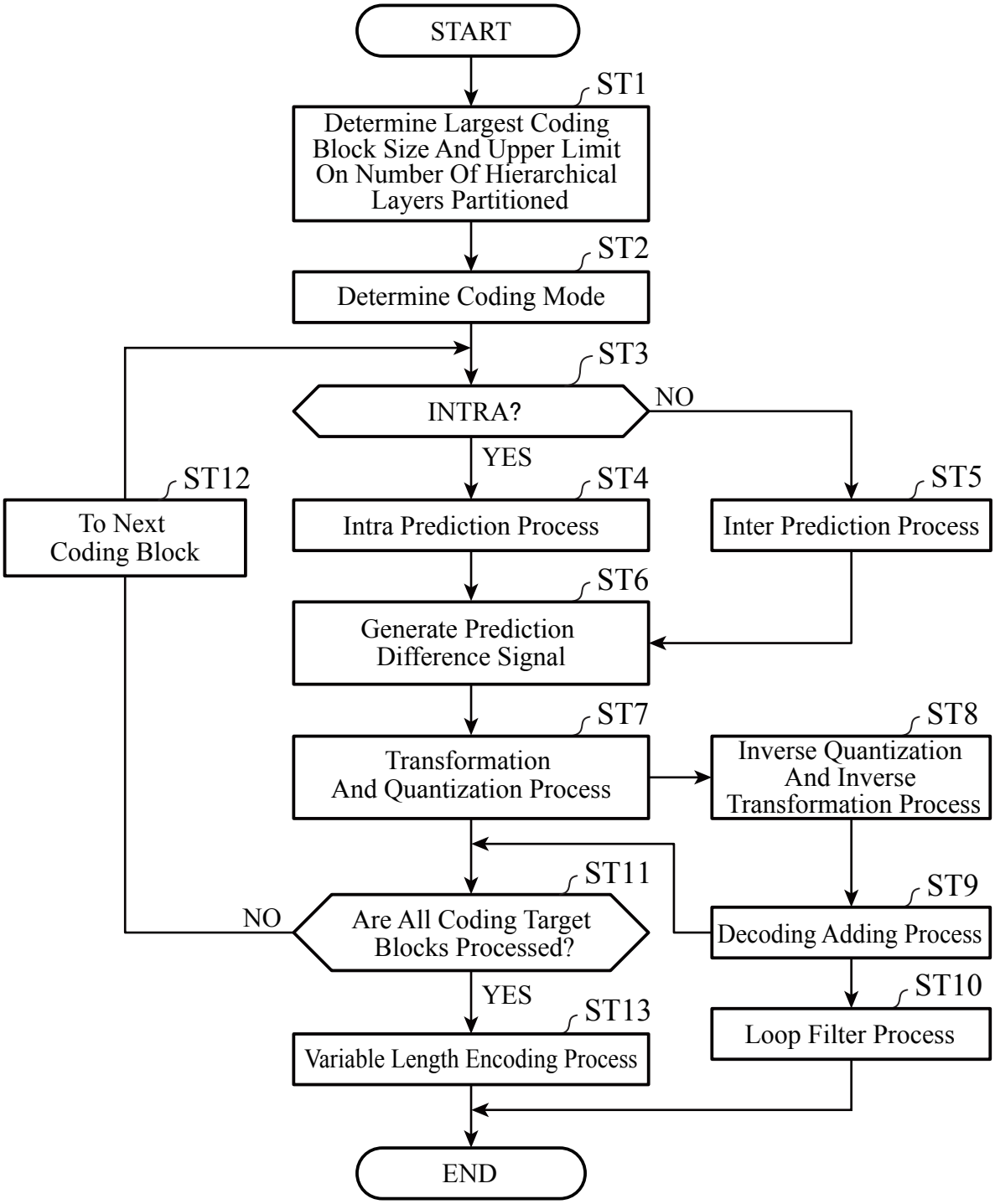

START
ST1
Determine Largest Coding Block Size And Upper Limit On Number Of Hierarchical Layers Partitioned
ST2
Determine Coding Mode
ST3
INTRA?
NO
YES
ST4
Intra Prediction Process
ST5
Inter Prediction Process
ST6
Generate Prediction Difference Signal
ST7
Transformation And Quantization Process
ST8
Inverse Quantization And Inverse Transformation Process
ST9
Decoding Adding Process
ST10
Loop Filter Process
ST11
Are All Coding Target Blocks Processed?
NO
YES
ST12
To Next Coding Block
ST13
Variable Length Encoding Process
END

FIG.3

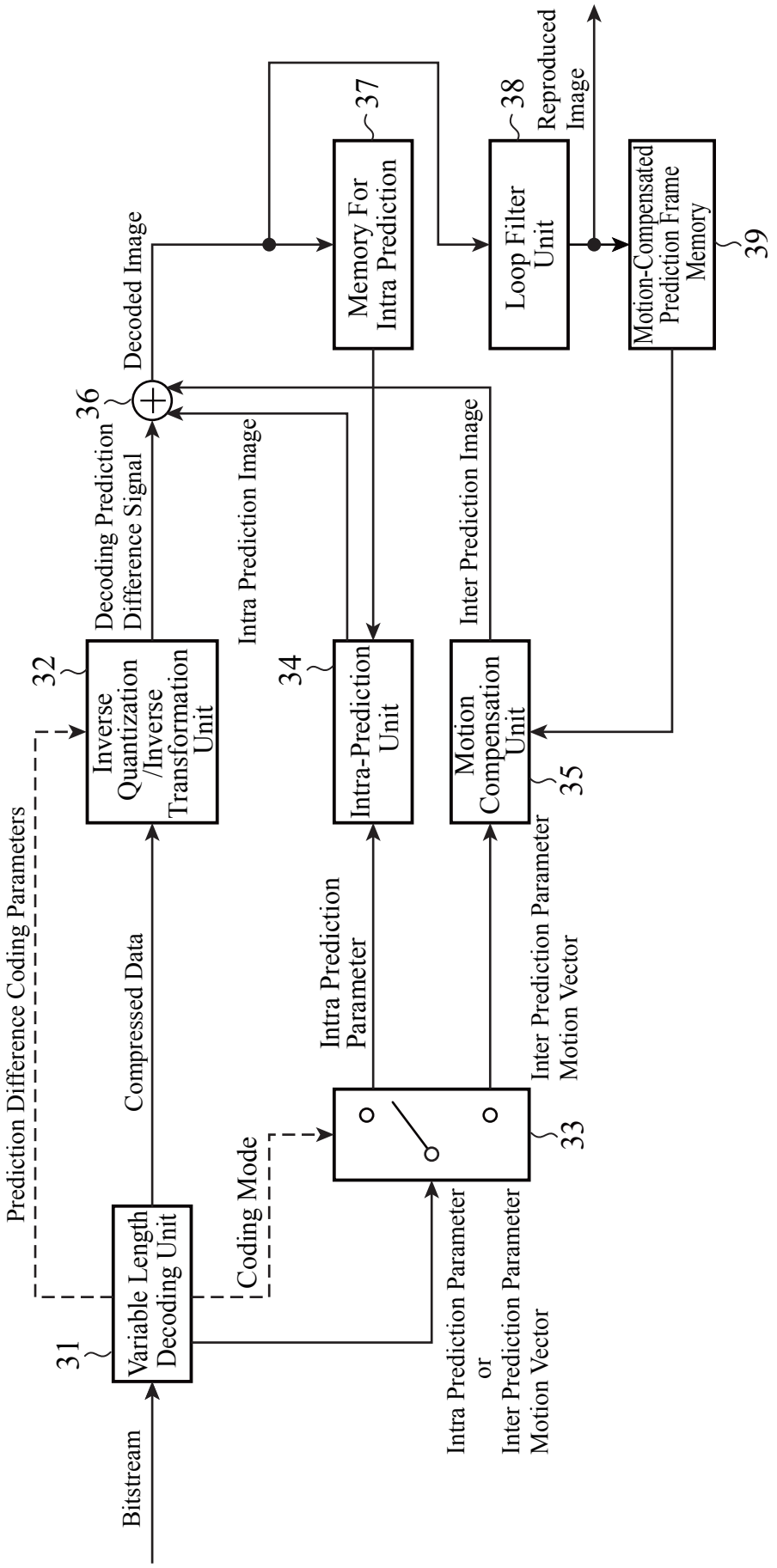

Bitstream
31
Variable Length Decoding Unit
Prediction Difference Coding Parameters
Coding Mode
Compressed Data
32
Inverse Quantization /Inverse Transformation Unit
Decoding Prediction Difference Signal
36
Decoded Image
Memory For Intra Prediction
37
Loop Filter Unit
38
Reproduced Image
Motion-Compensated Prediction Frame Memory
39
Intra Prediction Image
34
Intra-Prediction Unit
Intra Prediction Parameter
Inter Prediction Image
Motion Compensation Unit
35
Inter Prediction Parameter
Motion Vector
33
Intra Prediction Parameter
or
Inter Prediction Parameter
Motion Vector

FIG.4

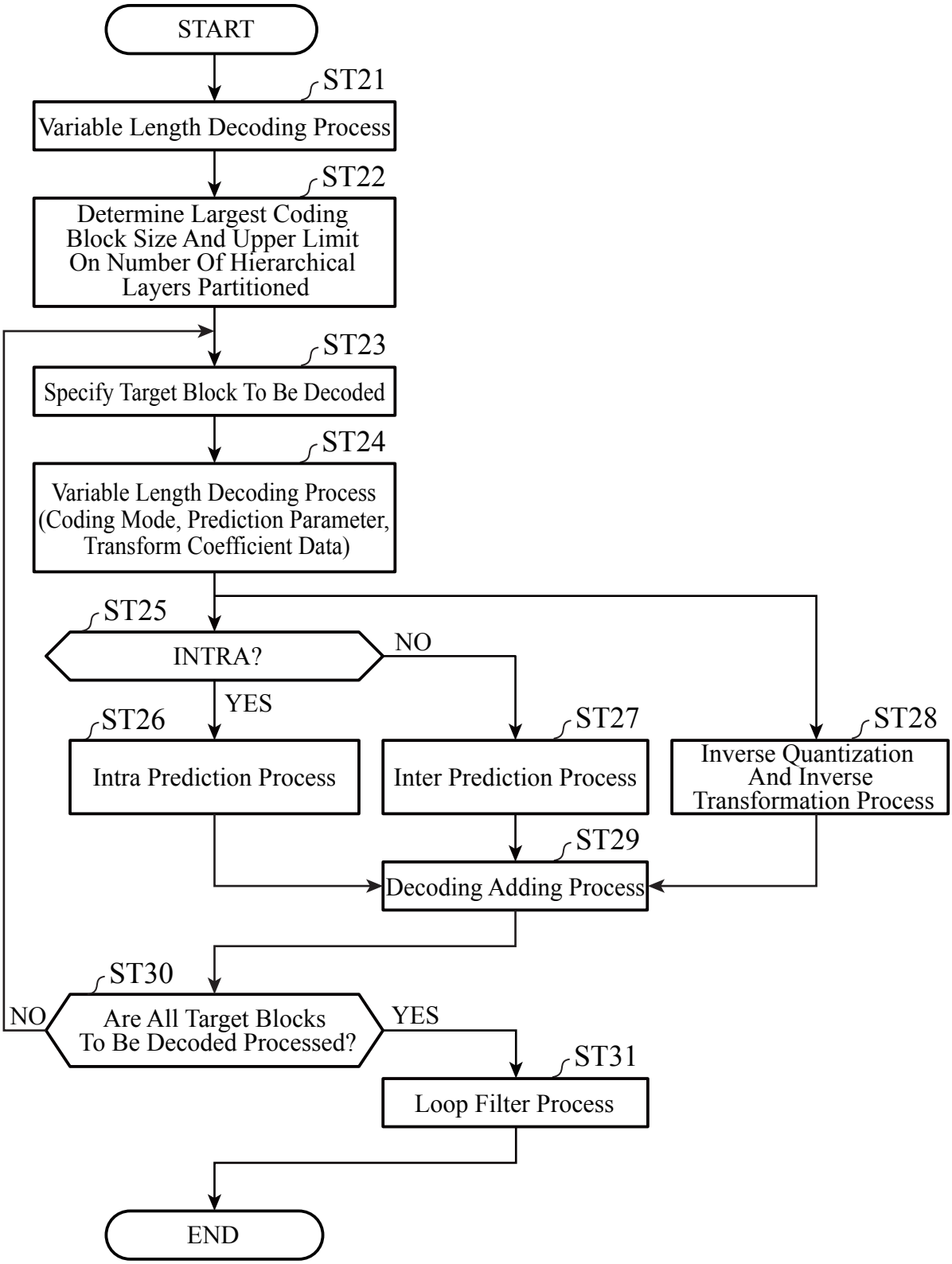

START
ST21
Variable Length Decoding Process
ST22
Determine Largest Coding Block Size And Upper Limit On Number Of Hierarchical Layers Partitioned
ST23
Specify Target Block To Be Decoded
ST24
Variable Length Decoding Process (Coding Mode, Prediction Parameter, Transform Coefficient Data)
ST25
INTRA?
NO
YES
ST26
Intra Prediction Process
ST27
Inter Prediction Process
ST28
Inverse Quantization And Inverse Transformation Process
ST29
Decoding Adding Process
ST30
Are All Target Blocks To Be Decoded Processed?
NO
YES
ST31
Loop Filter Process
END

FIG.5

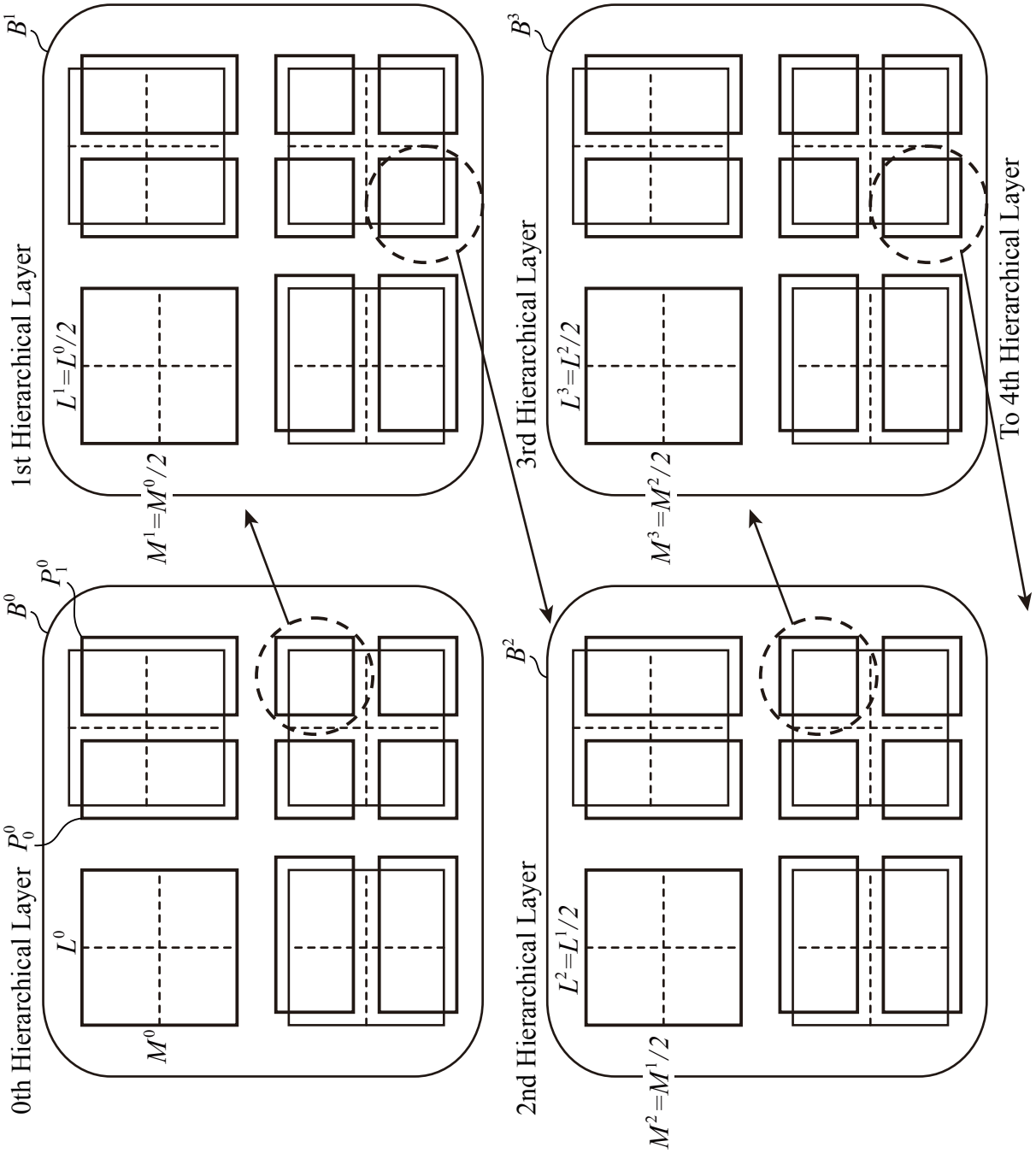

0th Hierarchical Layer
1st Hierarchical Layer
2nd Hierarchical Layer
3rd Hierarchical Layer
To 4th Hierarchical Layer
B^0
B^1
B^2
B^3
P_0^0
P_1^0
L^0
M^0
$L^1=L^0/2$
$M^1=M^0/2$
$L^2=L^1/2$
$M^2=M^1/2$
$L^3=L^2/2$
$M^3=M^2/2$

FIG.6

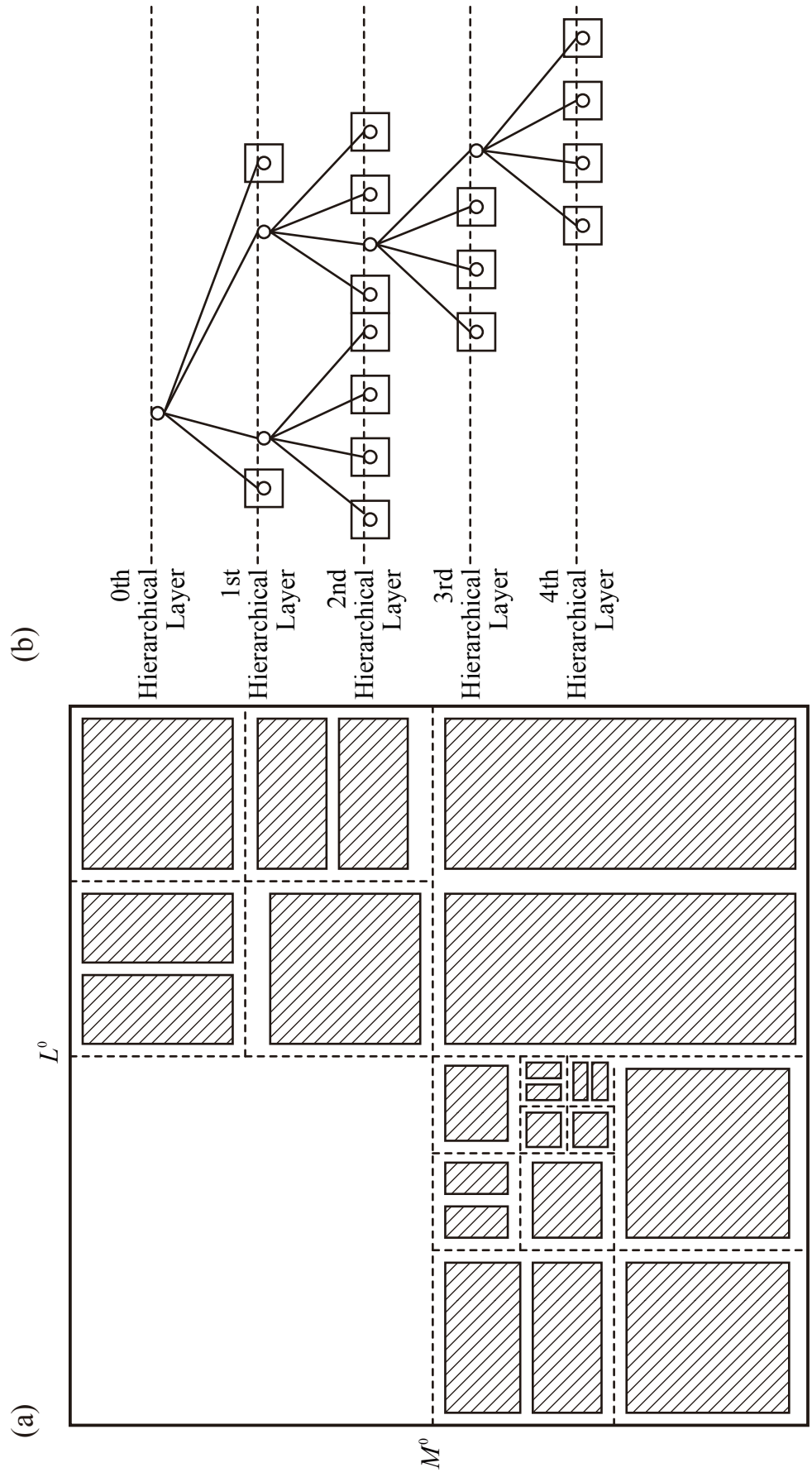

(a)
(b)
L^0
M^0
0th Hierarchical Layer
1st Hierarchical Layer
2nd Hierarchical Layer
3rd Hierarchical Layer
4th Hierarchical Layer

FIG.7

Intra Prediction Mode Index	Intra Prediction Mode
0	Planar Prediction
1	Vertical Prediction
2	Horizontal Prediction
3	Average (DC) Prediction
4 ~ N_I-1	Diagonal Prediction

N_I:Intra Prediction Mode Number

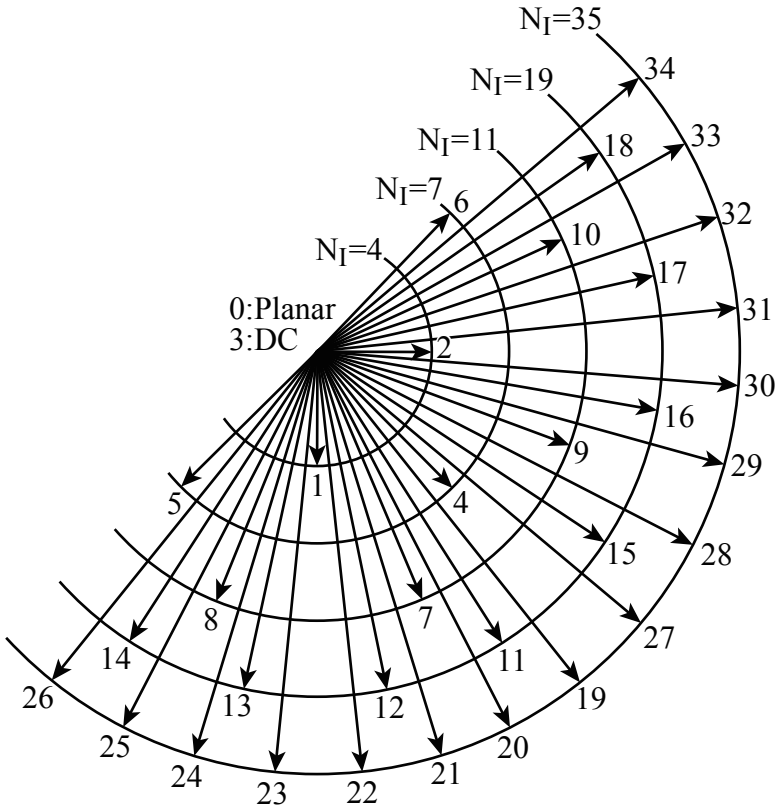


FIG.8

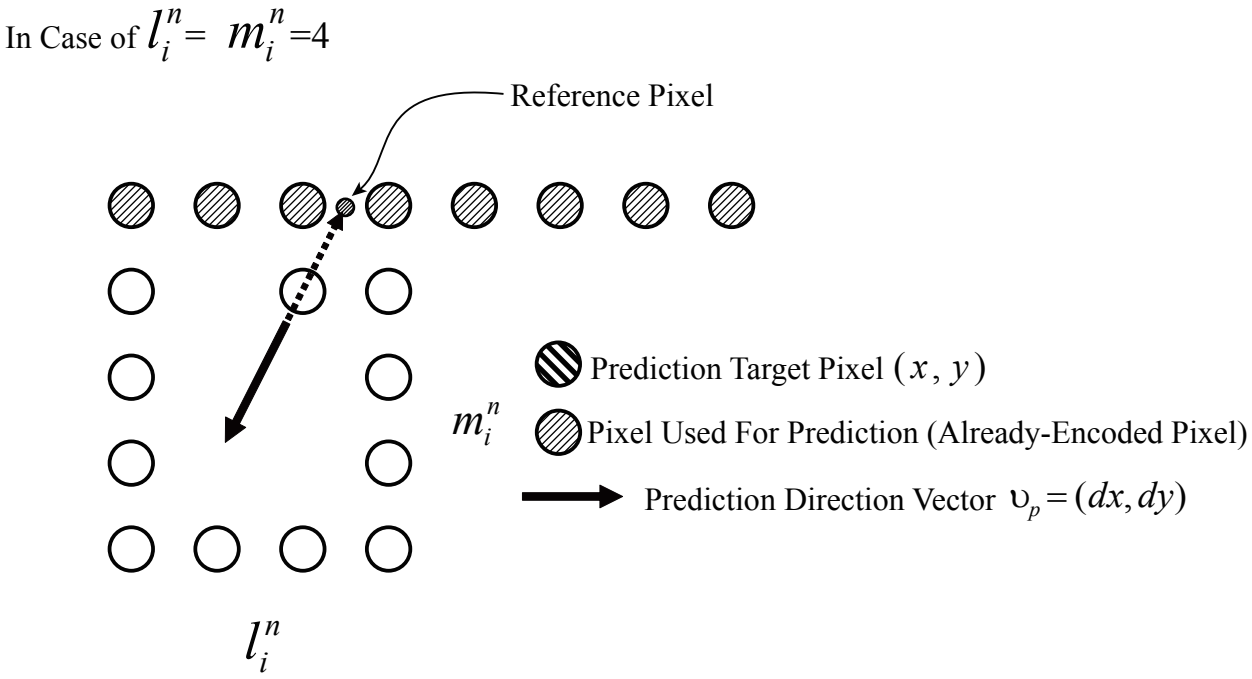

In Case of $l_i^n = m_i^n = 4$
Reference Pixel
m_i^n
l_i^n
Prediction Target Pixel (x, y)
Pixel Used For Prediction (Already-Encoded Pixel)
Prediction Direction Vector $\upsilon_p = (dx, dy)$

FIG.9

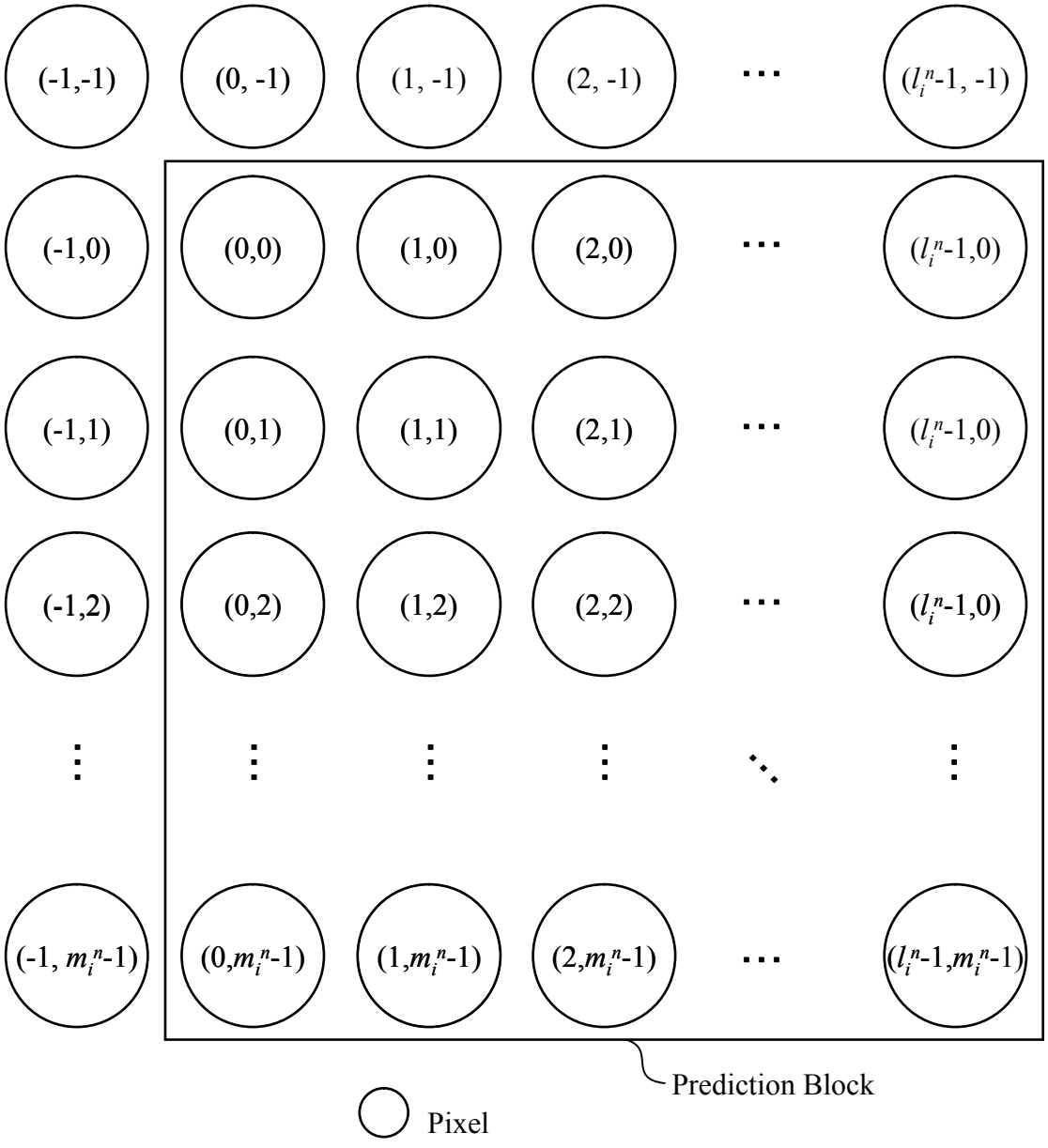

(-1,-1)
(0, -1)
(1, -1)
(2, -1)
(l_i^n-1, -1)
(-1,0)
(0,0)
(1,0)
(2,0)
(l_i^n-1,0)
(-1,1)
(0,1)
(1,1)
(2,1)
(l_i^n-1,0)
(-1,2)
(0,2)
(1,2)
(2,2)
(l_i^n-1,0)
(-1, m_i^n-1)
(0,m_i^n-1)
(1,m_i^n-1)
(2,m_i^n-1)
(l_i^n-1,m_i^n-1)
Prediction Block
Pixel

FIG.10

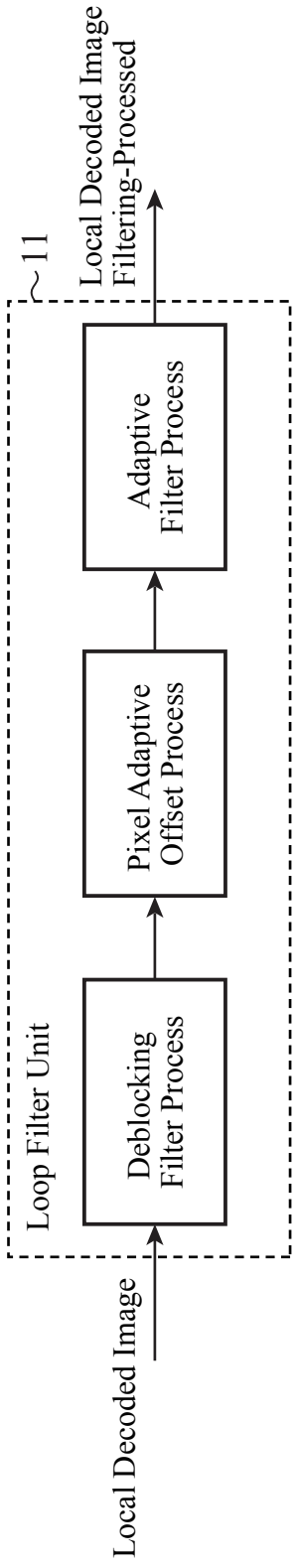

Local Decoded Image
Loop Filter Unit
11
Deblocking Filter Process
Pixel Adaptive Offset Process
Adaptive Filter Process
Local Decoded Image Filtering-Processed

FIG.11

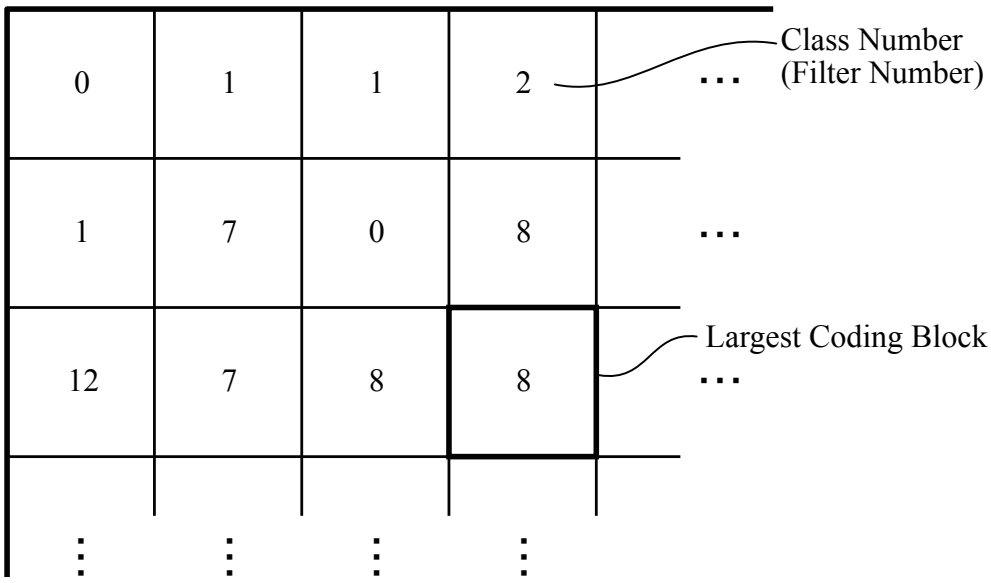

0
1
1
2
Class Number
(Filter Number)
1
7
0
8
12
7
8
8
Largest Coding Block

FIG.12

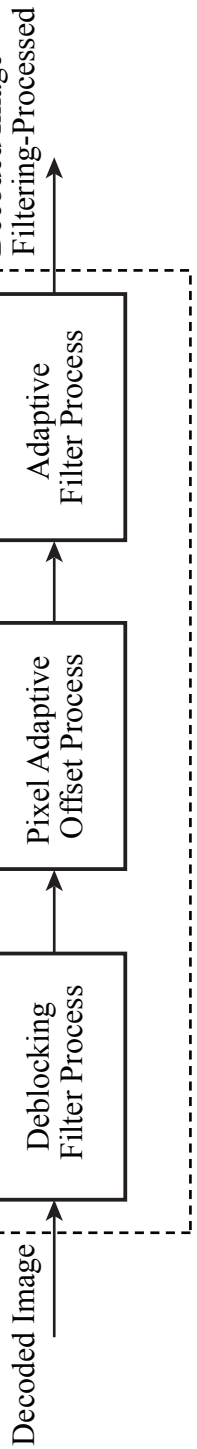

Decoded Image
Loop Filter Unit
38
Deblocking Filter Process
Pixel Adaptive Offset Process
Adaptive Filter Process
Decoded Image Filtering-Processed

FIG.13

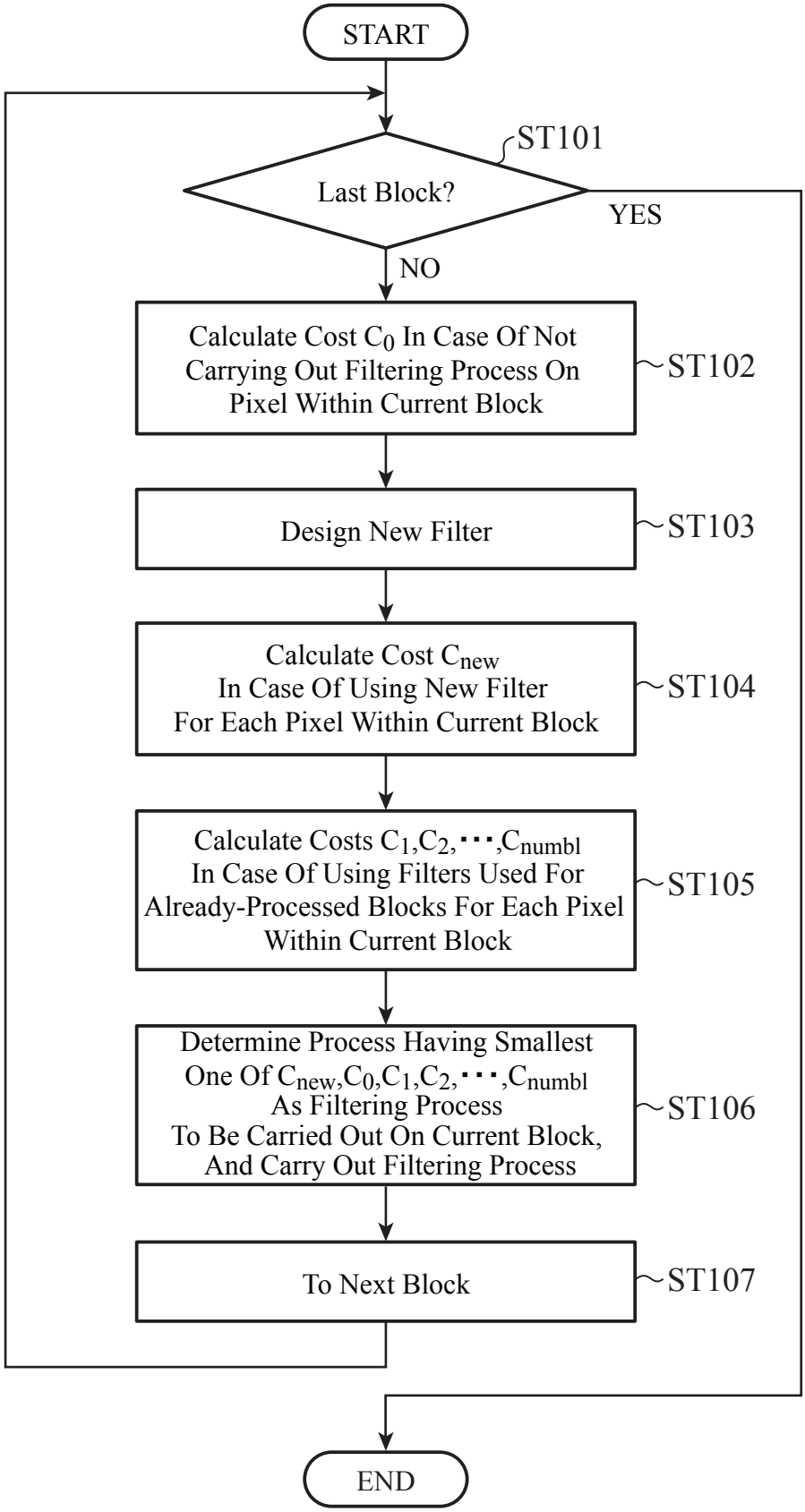

START
ST101
Last Block?
YES
NO
Calculate Cost C_0 In Case Of Not Carrying Out Filtering Process On Pixel Within Current Block
ST102
Design New Filter
ST103
Calculate Cost C_{new} In Case Of Using New Filter For Each Pixel Within Current Block
ST104
Calculate Costs $C_1,C_2,\cdots,C_{numbl}$ In Case Of Using Filters Used For Already-Processed Blocks For Each Pixel Within Current Block
ST105
Determine Process Having Smallest One Of $C_{new},C_0,C_1,C_2,\cdots,C_{numbl}$ As Filtering Process To Be Carried Out On Current Block, And Carry Out Filtering Process
ST106
To Next Block
ST107
END

FIG.14

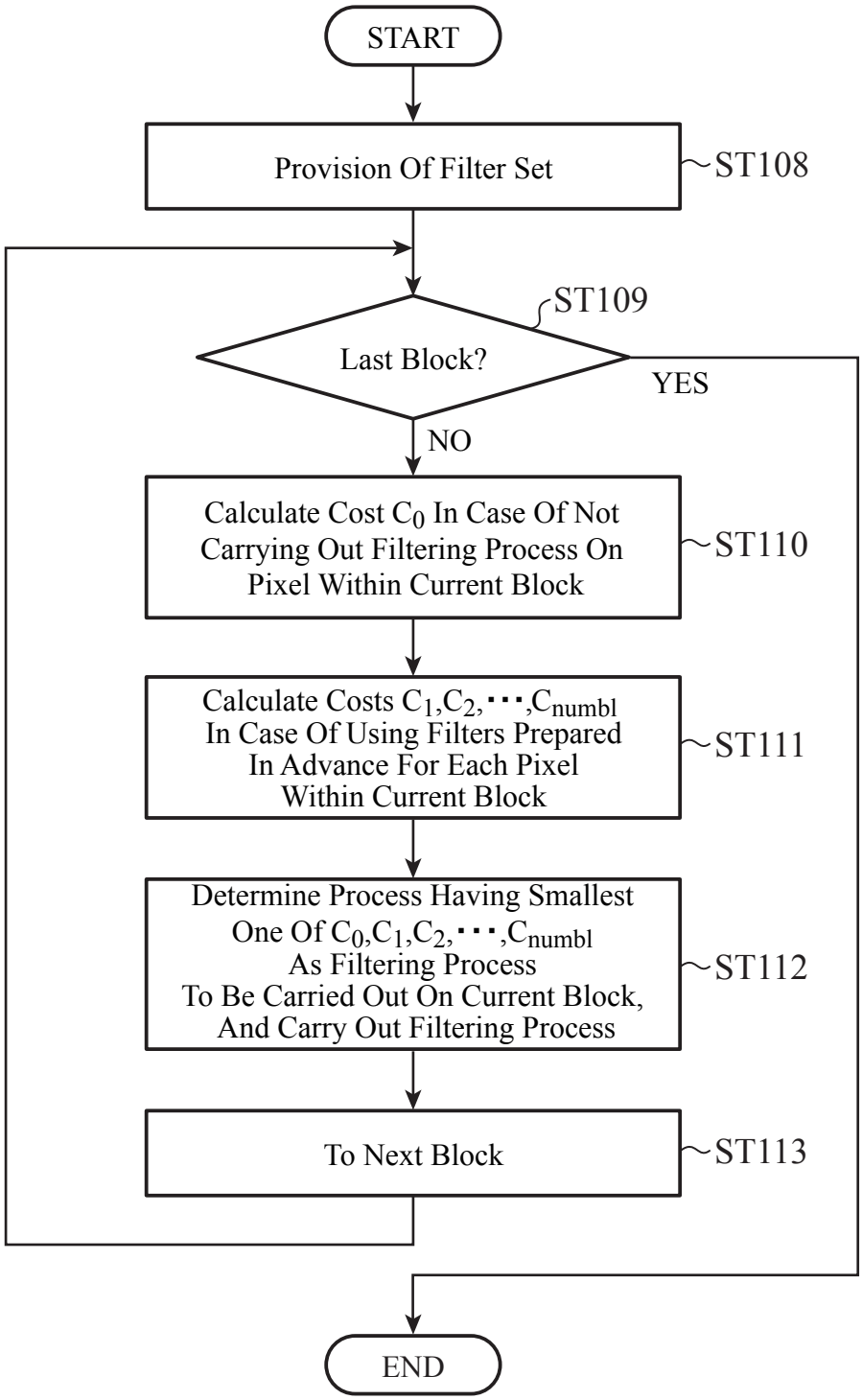

START
Provision Of Filter Set
ST108
ST109
Last Block?
YES
NO
Calculate Cost C_0 In Case Of Not Carrying Out Filtering Process On Pixel Within Current Block
ST110
Calculate Costs $C_1, C_2, \cdots, C_{numbl}$ In Case Of Using Filters Prepared In Advance For Each Pixel Within Current Block
ST111
Determine Process Having Smallest One Of $C_0, C_1, C_2, \cdots, C_{numbl}$ As Filtering Process To Be Carried Out On Current Block, And Carry Out Filtering Process
ST112
To Next Block
ST113
END

FIG.15

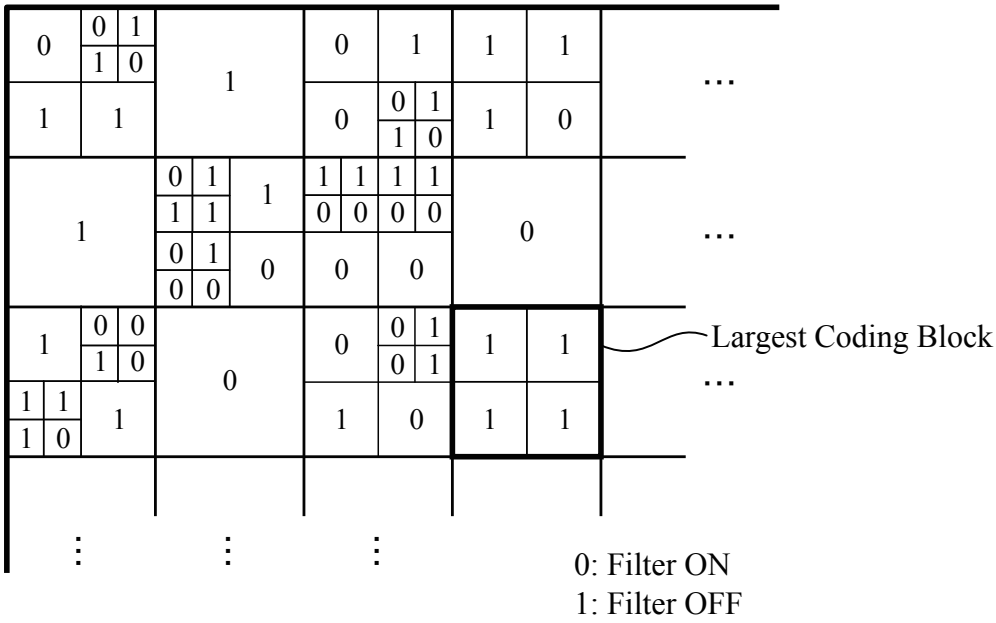

Largest Coding Block
0: Filter ON
1: Filter OFF

FIG.16

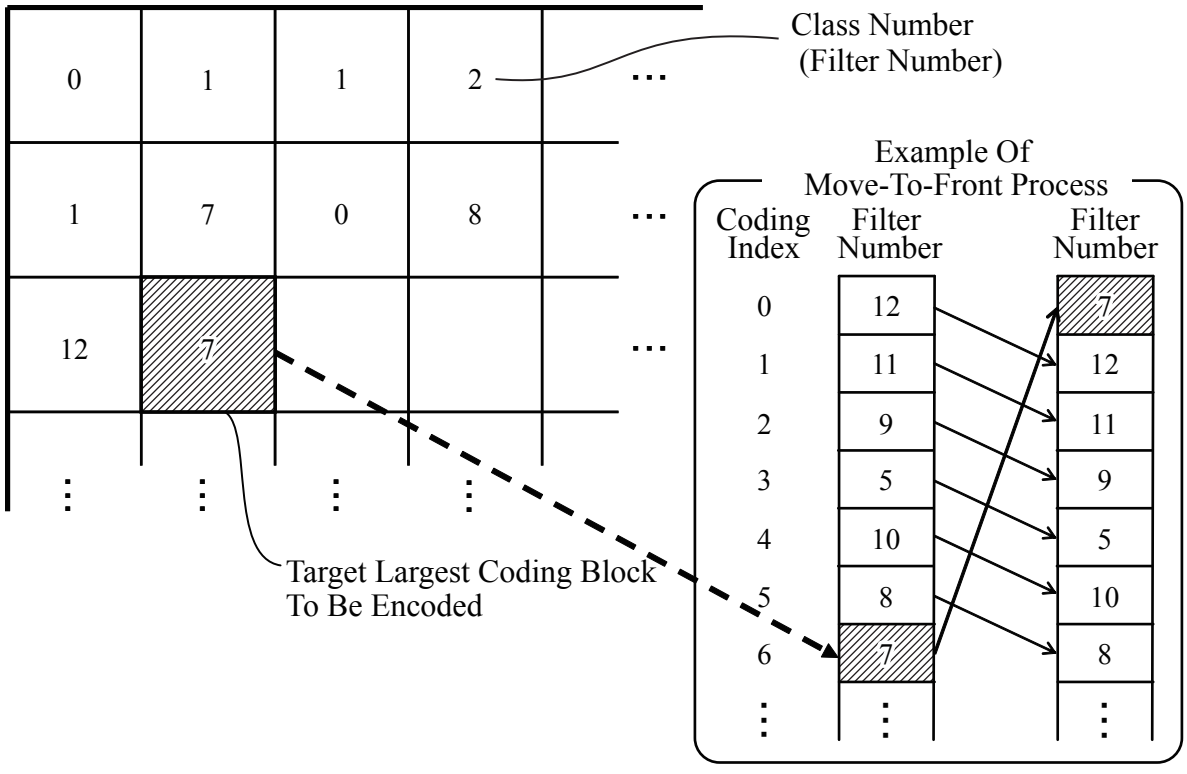

Class Number
(Filter Number)
Example Of
Move-To-Front Process
Coding Index
Filter Number
Filter Number
Target Largest Coding Block
To Be Encoded

FIG.17

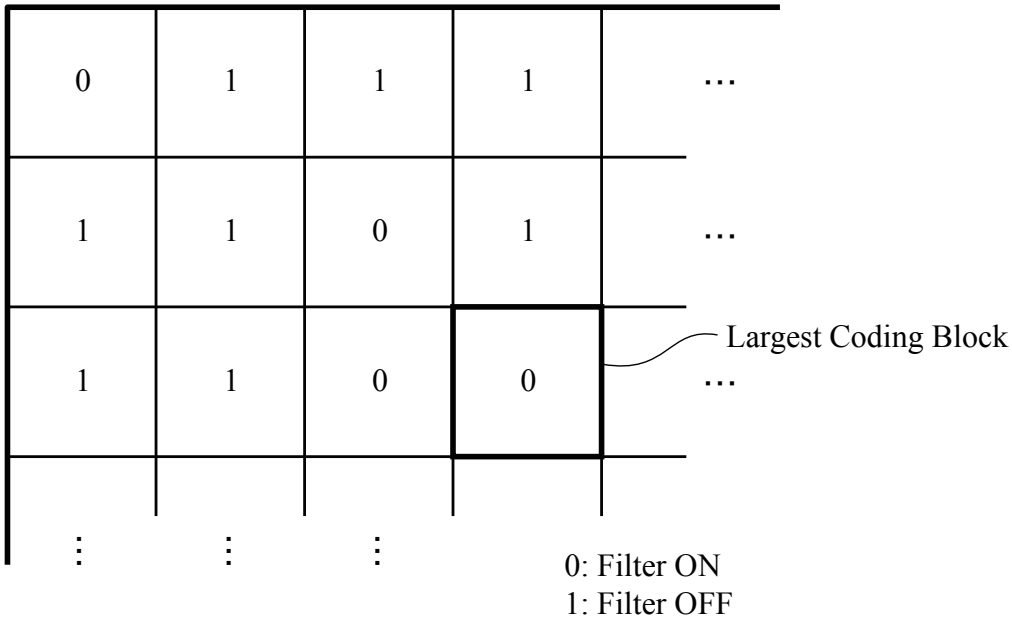


FIG.18

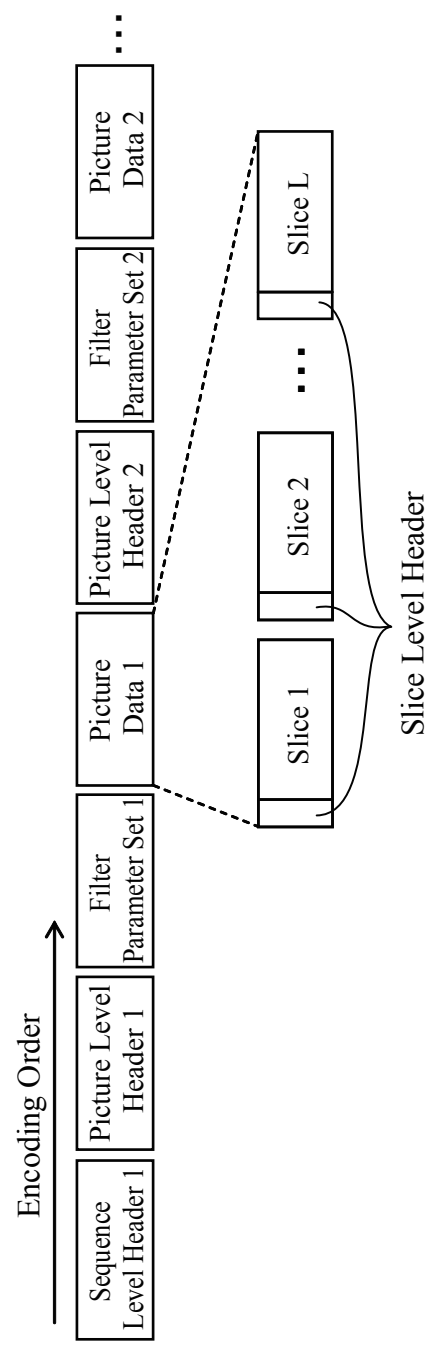

Encoding Order
Sequence Level Header 1
Picture Level Header 1
Filter Parameter Set 1
Picture Data 1
Picture Level Header 2
Filter Parameter Set 2
Picture Data 2
...
Slice 1
Slice 2
...
Slice L
Slice Level Header

FIG.19

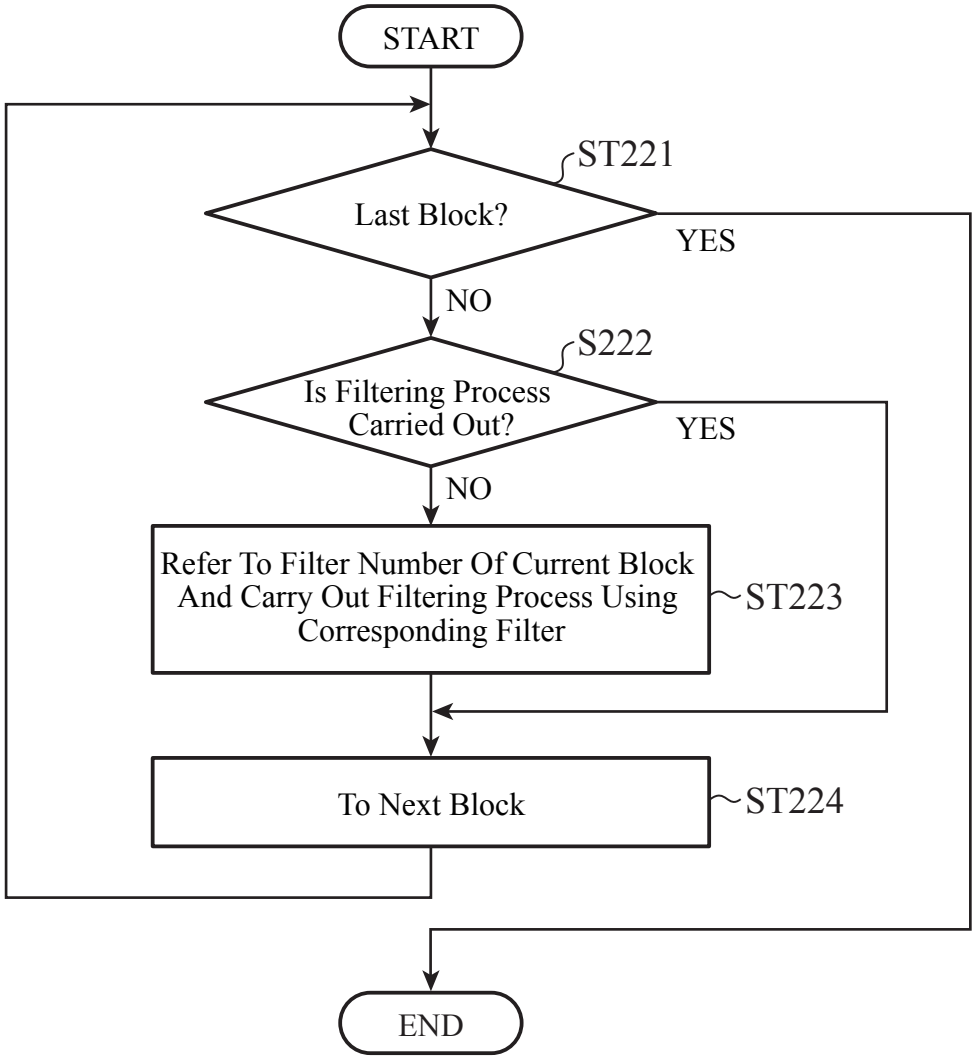
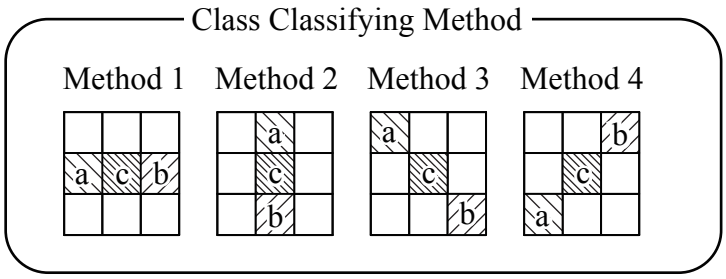

START
ST221
Last Block?
YES
NO
S222
Is Filtering Process Carried Out?
YES
NO
Refer To Filter Number Of Current Block And Carry Out Filtering Process Using Corresponding Filter
ST223
To Next Block
ST224
END

FIG.20



Classification Criteria In Each Class Classifying Method

Class	Criterion
1	c< a && c < b
2	(c < a&& c = b) || (c < b&& c = a)
3	(c > a&& c = b) || (c > b&& c = a)
4	c>a && c > b
0	Other Than Classes 1 To 4

A, B, C: Brightness Value Of Each Pixel

FIG.21

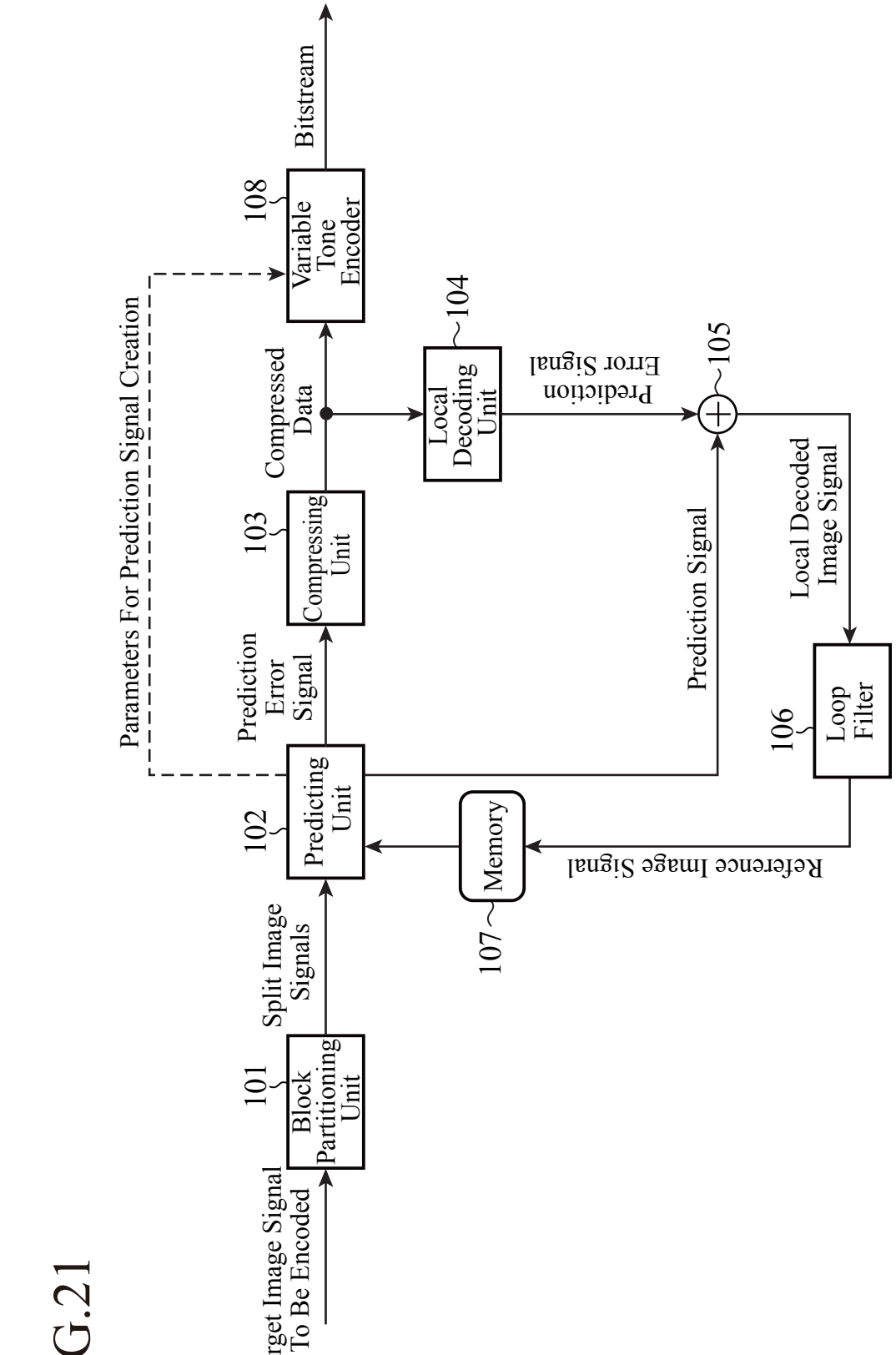

Target Image Signal To Be Encoded
101
Block Partitioning Unit
Split Image Signals
102
Predicting Unit
Parameters For Prediction Signal Creation
Prediction Error Signal
103
Compressing Unit
Compressed Data
108
Variable Tone Encoder
Bitstream
104
Local Decoding Unit
Prediction Error Signal
105
Prediction Signal
Local Decoded Image Signal
106
Loop Filter
107
Memory
Reference Image Signal

FIG.22

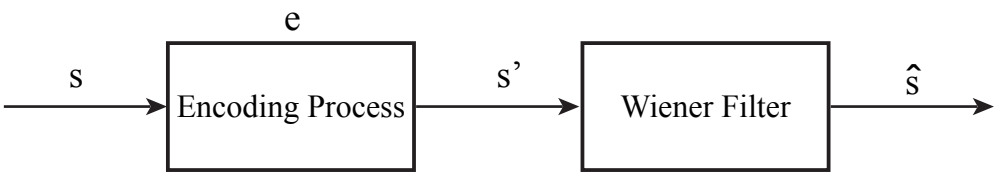


FIG.23

Filter1 run =2 no merge-above	Filter1	Filter1	Filter2 run =1 no merge-above	Filter2
Filter3 run=2 merge-above=0	Filter3	Filter3	Filter2 run=1 merge-above=1	Filter2
Filter4 run=4 merge-above=0	Filter4	Filter4	Filter4	Filter4

Target Picture For Filtering Process