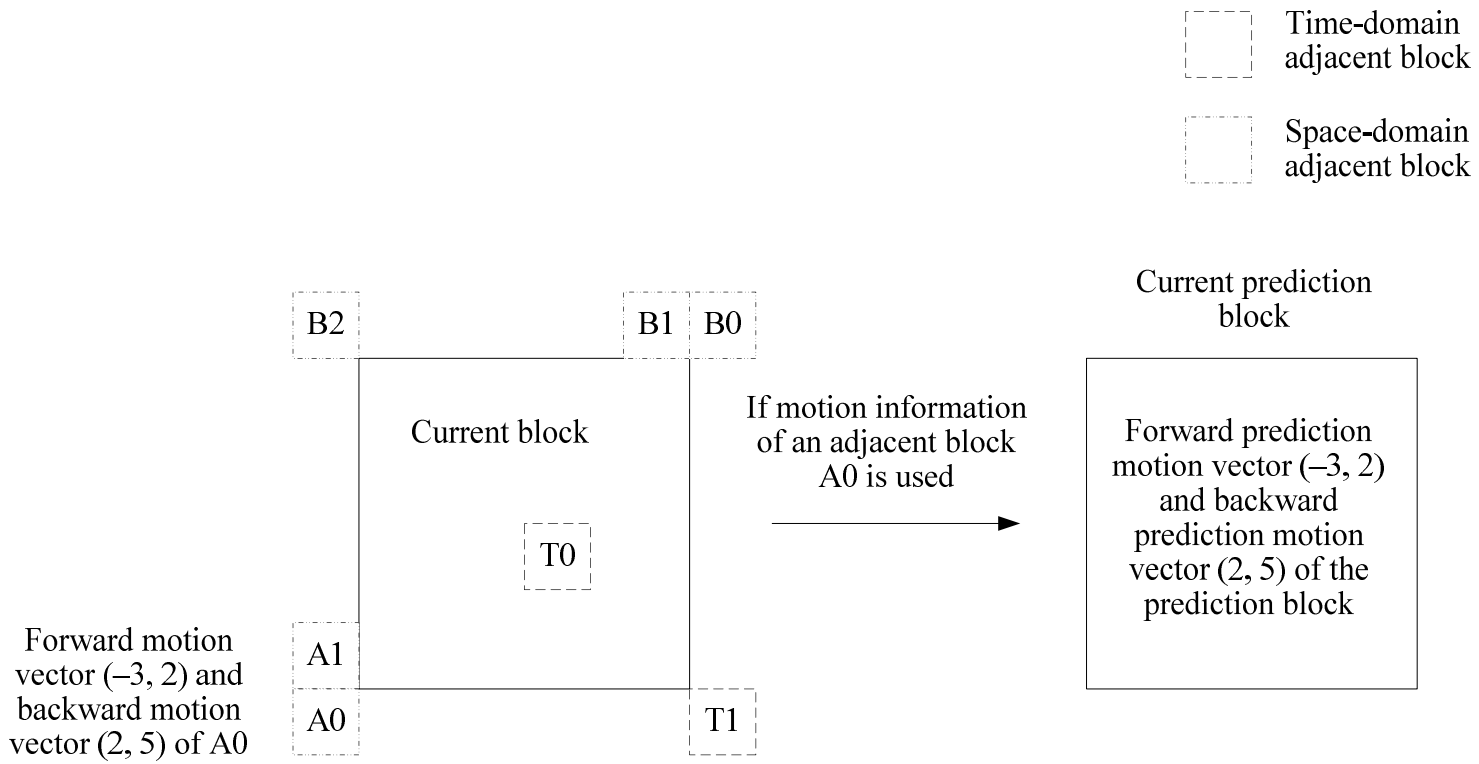
Time-domain adjacent block
Space-domain adjacent block
B2
B1
B0
Current block
T0
A1
A0
T1
Forward motion vector (–3, 2) and backward motion vector (2, 5) of A0
If motion information of an adjacent block A0 is used
Current prediction block
Forward prediction motion vector (–3, 2) and backward prediction motion vector (2, 5) of the prediction block

FIG. 1A

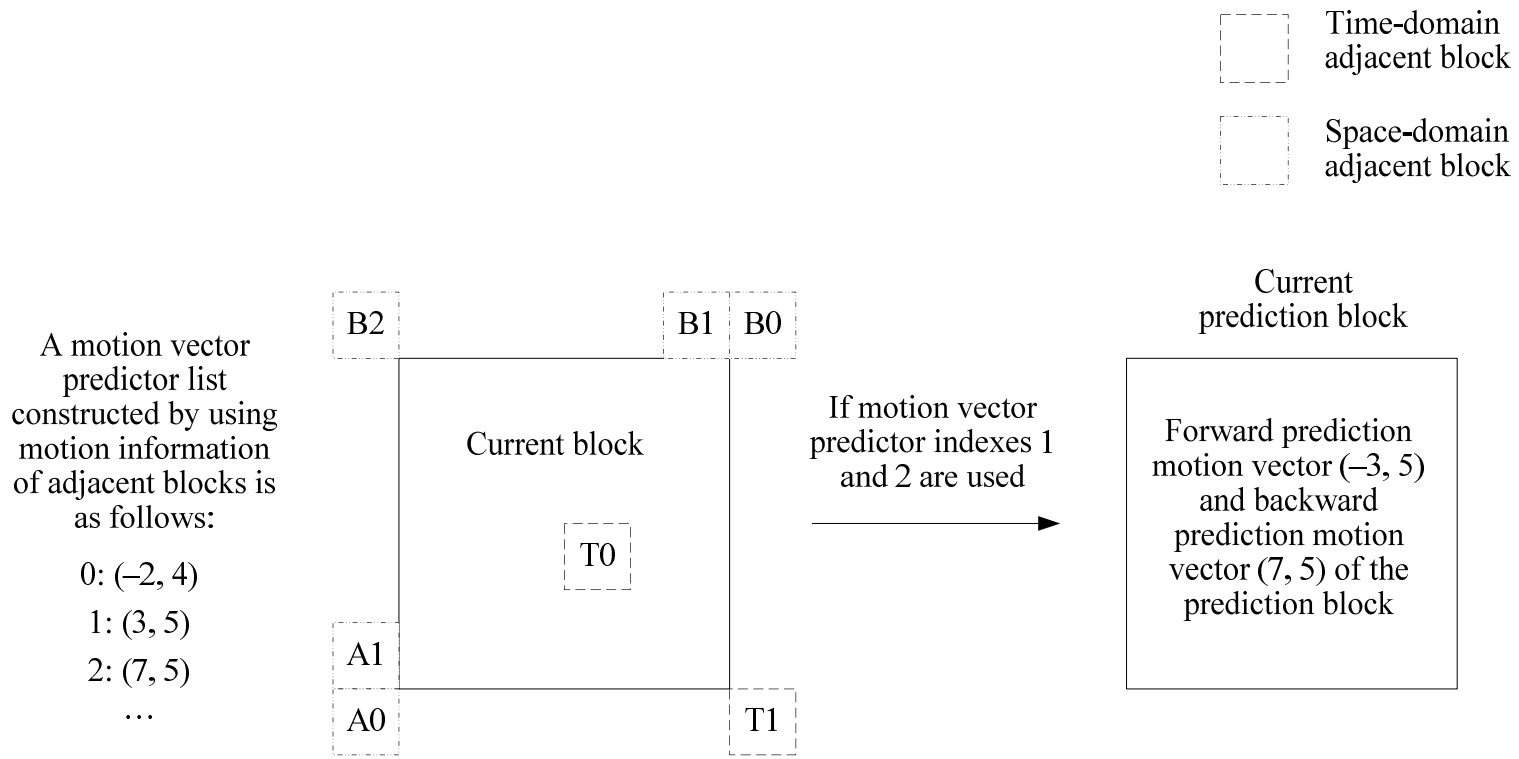
Time-domain adjacent block
Space-domain adjacent block
A motion vector predictor list constructed by using motion information of adjacent blocks is as follows:
0: (–2, 4)
1: (3, 5)
2: (7, 5)
…
B2
B1
B0
Current block
T0
A1
A0
T1
If motion vector predictor indexes 1 and 2 are used
Current prediction block
Forward prediction motion vector (–3, 5) and backward prediction motion vector (7, 5) of the prediction block

FIG. 1B

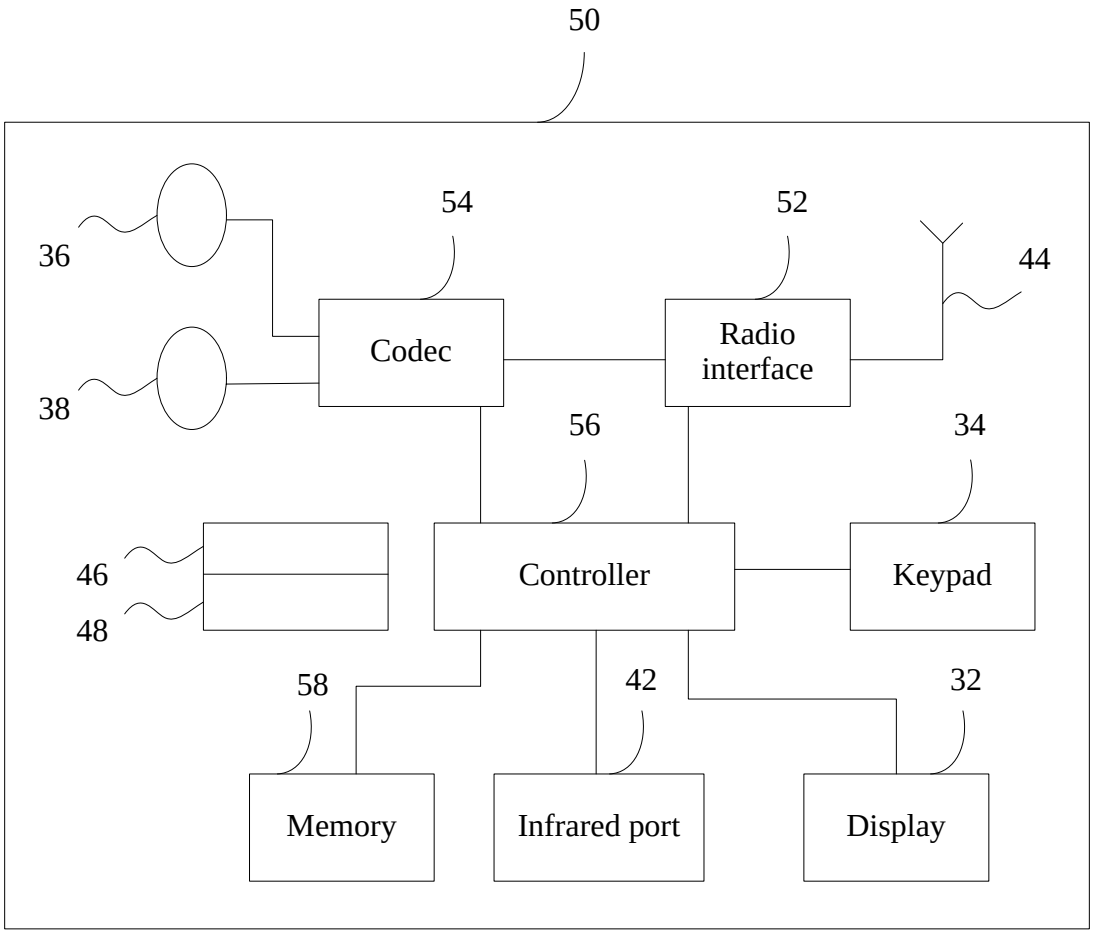
50
36
38
54
52
44
Codec
Radio interface
56
34
46
48
Controller
Keypad
58
42
32
Memory
Infrared port
Display

FIG. 2

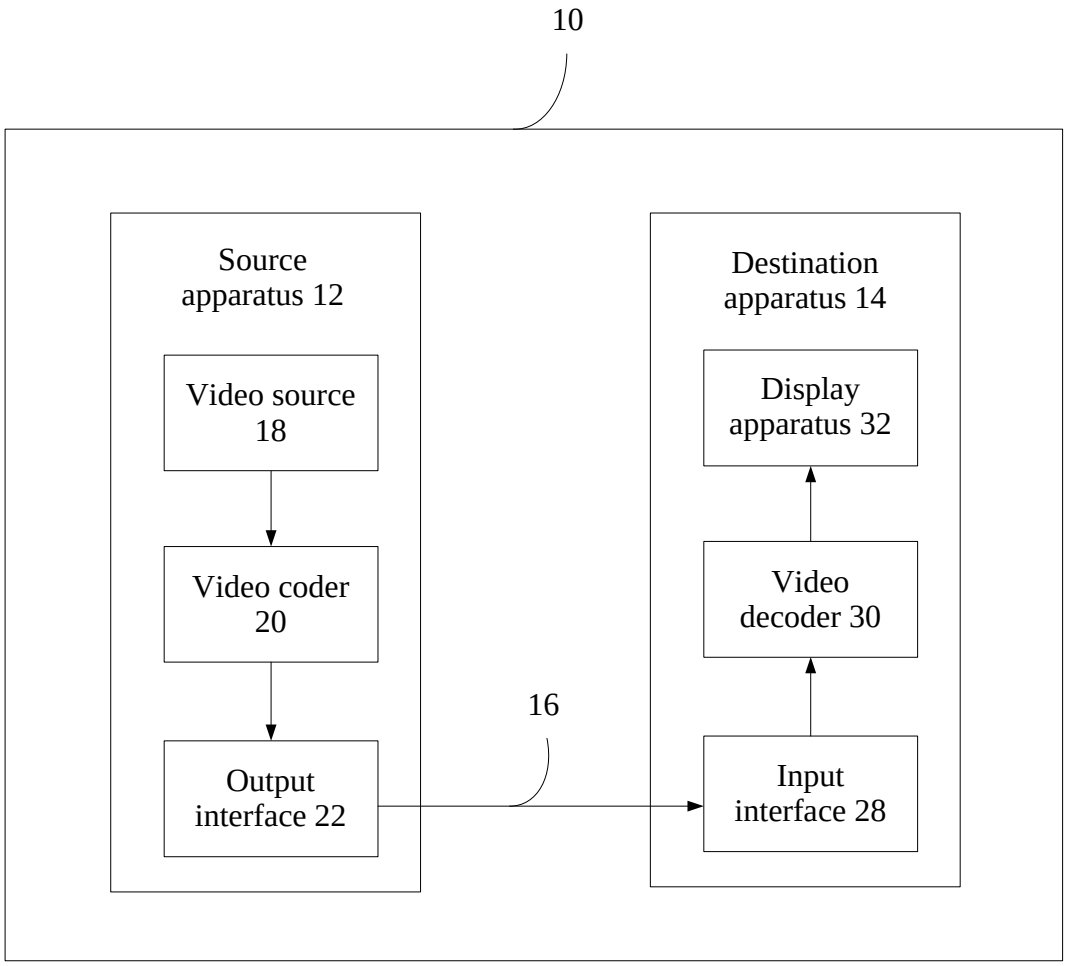
10
Source apparatus 12
Video source 18
Video coder 20
Output interface 22
16
Destination apparatus 14
Display apparatus 32
Video decoder 30
Input interface 28

FIG. 3

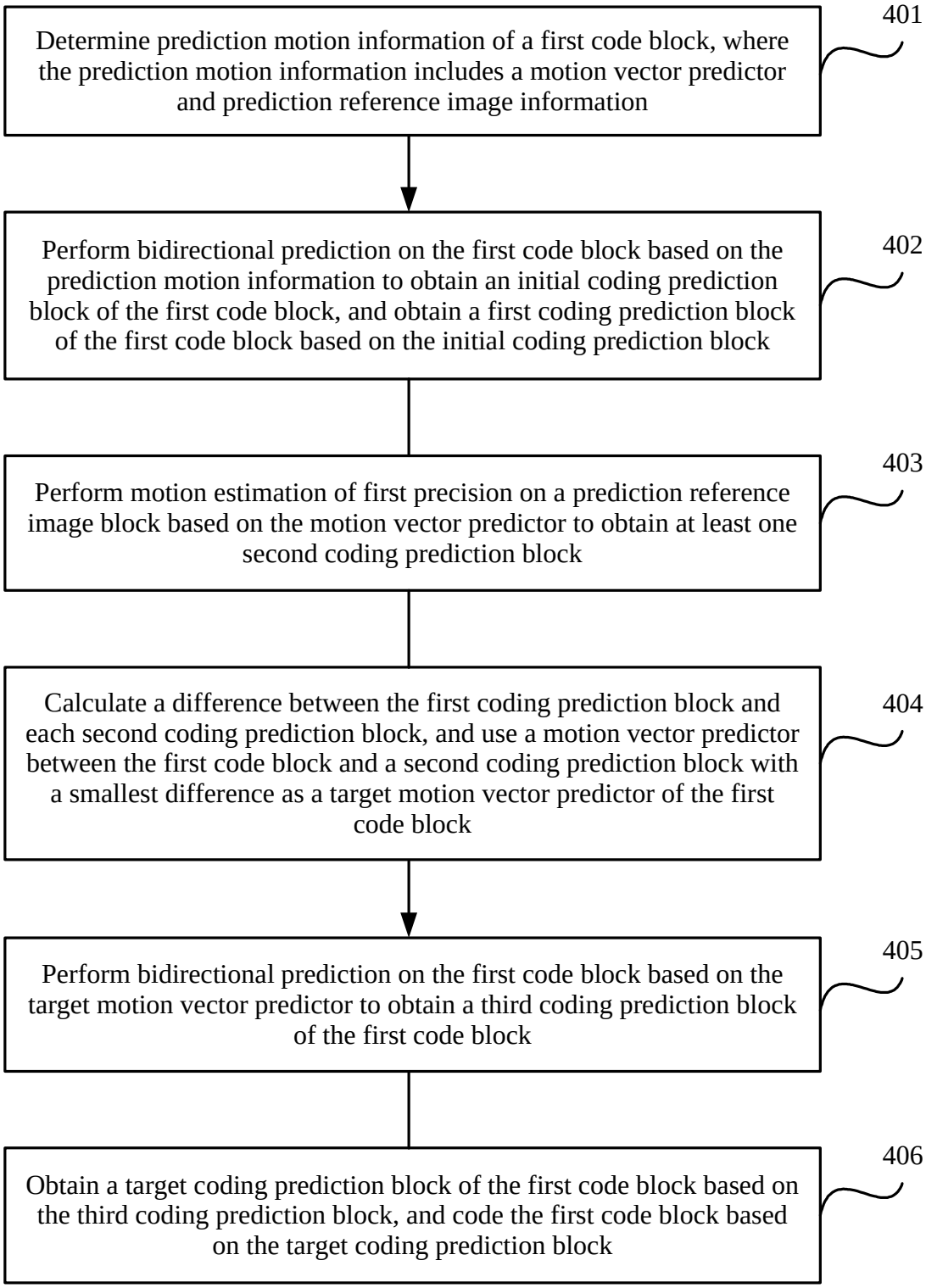
Determine prediction motion information of a first code block, where the prediction motion information includes a motion vector predictor and prediction reference image information
401
Perform bidirectional prediction on the first code block based on the prediction motion information to obtain an initial coding prediction block of the first code block, and obtain a first coding prediction block of the first code block based on the initial coding prediction block
402
Perform motion estimation of first precision on a prediction reference image block based on the motion vector predictor to obtain at least one second coding prediction block
403
Calculate a difference between the first coding prediction block and each second coding prediction block, and use a motion vector predictor between the first code block and a second coding prediction block with a smallest difference as a target motion vector predictor of the first code block
404
Perform bidirectional prediction on the first code block based on the target motion vector predictor to obtain a third coding prediction block of the first code block
405
Obtain a target coding prediction block of the first code block based on the third coding prediction block, and code the first code block based on the target coding prediction block
406

FIG. 4

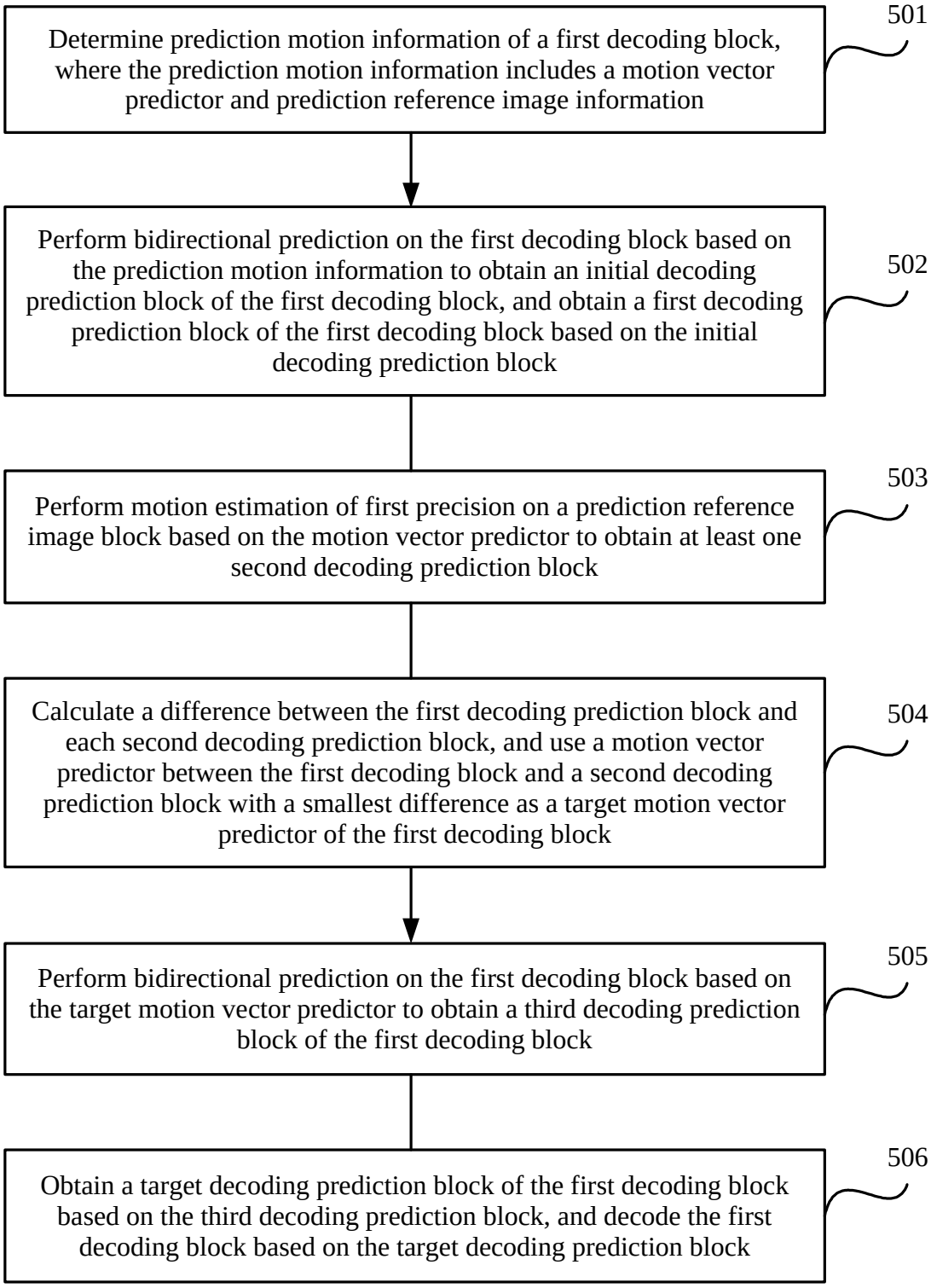
Determine prediction motion information of a first decoding block, where the prediction motion information includes a motion vector predictor and prediction reference image information
501
Perform bidirectional prediction on the first decoding block based on the prediction motion information to obtain an initial decoding prediction block of the first decoding block, and obtain a first decoding prediction block of the first decoding block based on the initial decoding prediction block
502
Perform motion estimation of first precision on a prediction reference image block based on the motion vector predictor to obtain at least one second decoding prediction block
503
Calculate a difference between the first decoding prediction block and each second decoding prediction block, and use a motion vector predictor between the first decoding block and a second decoding prediction block with a smallest difference as a target motion vector predictor of the first decoding block
504
Perform bidirectional prediction on the first decoding block based on the target motion vector predictor to obtain a third decoding prediction block of the first decoding block
505
Obtain a target decoding prediction block of the first decoding block based on the third decoding prediction block, and decode the first decoding block based on the target decoding prediction block
506

FIG. 5

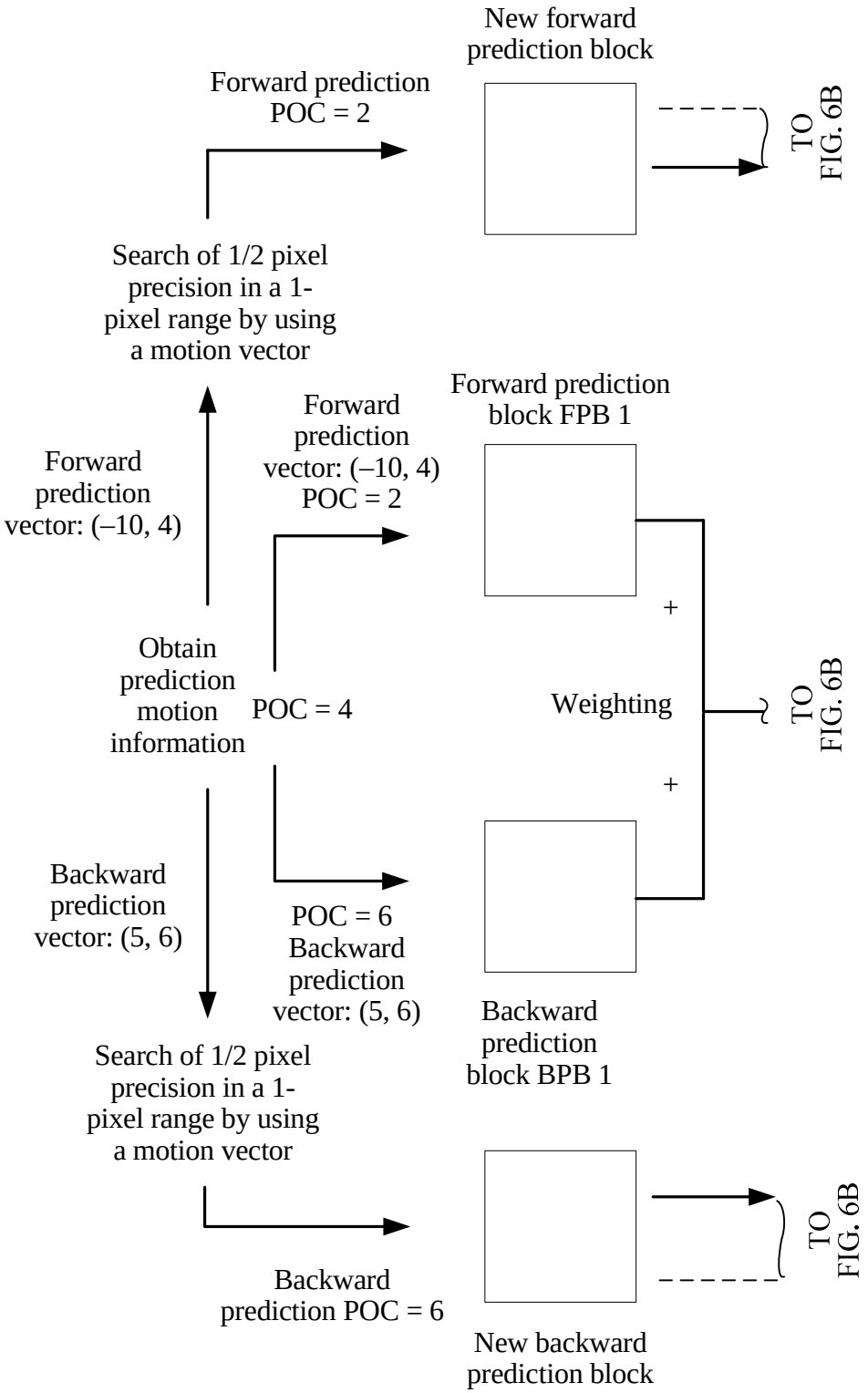
New forward prediction block
Forward prediction POC = 2
TO FIG. 6B
Search of 1/2 pixel precision in a 1-pixel range by using a motion vector
Forward prediction block FPB 1
Forward prediction vector: (–10, 4)
Forward prediction vector: (–10, 4) POC = 2
+
Obtain prediction motion information
POC = 4
Weighting
TO FIG. 6B
+
Backward prediction vector: (5, 6)
POC = 6 Backward prediction vector: (5, 6)
Backward prediction block BPB 1
Search of 1/2 pixel precision in a 1-pixel range by using a motion vector
Backward prediction POC = 6
TO FIG. 6B
New backward prediction block

FIG. 6A

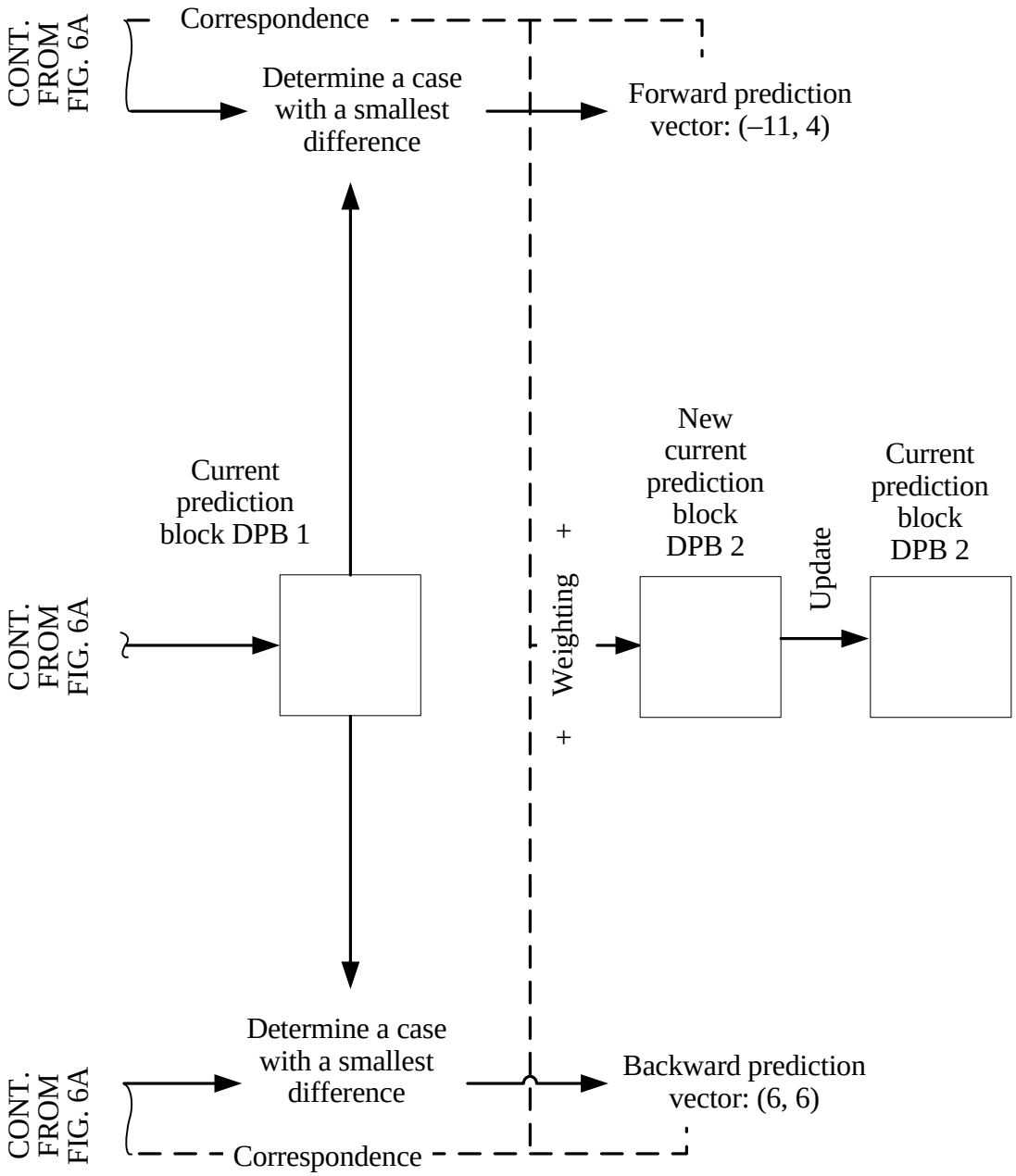
CONT. FROM FIG. 6A
Correspondence
Determine a case with a smallest difference
Forward prediction vector: (–11, 4)
Current prediction block DPB 1
CONT. FROM FIG. 6A
+
Weighting
+
New current prediction block DPB 2
Update
Current prediction block DPB 2
Determine a case with a smallest difference
CONT. FROM FIG. 6A
Backward prediction vector: (6, 6)
Correspondence

FIG. 6B

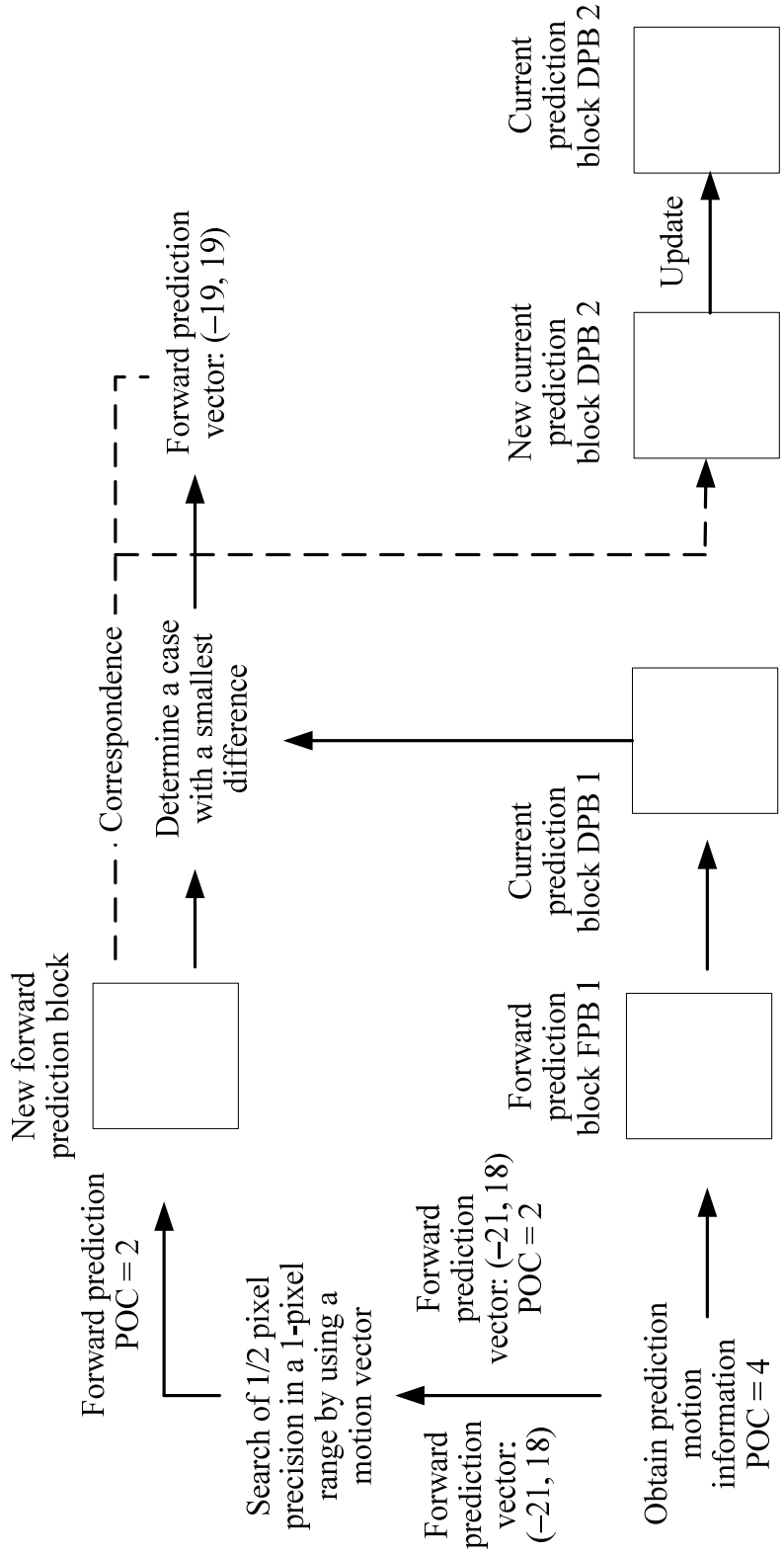
Obtain prediction motion information POC = 4
Forward prediction vector: (–21, 18)
Search of 1/2 pixel precision in a 1-pixel range by using a motion vector
Forward prediction POC = 2
Forward prediction vector: (–21, 18) POC = 2
Forward prediction block FPB 1
Current prediction block DPB 1
Correspondence
Determine a case with a smallest difference
Forward prediction vector: (–19, 19)
New forward prediction block
New current prediction block DPB 2
Update
Current prediction block DPB 2

FIG. 7

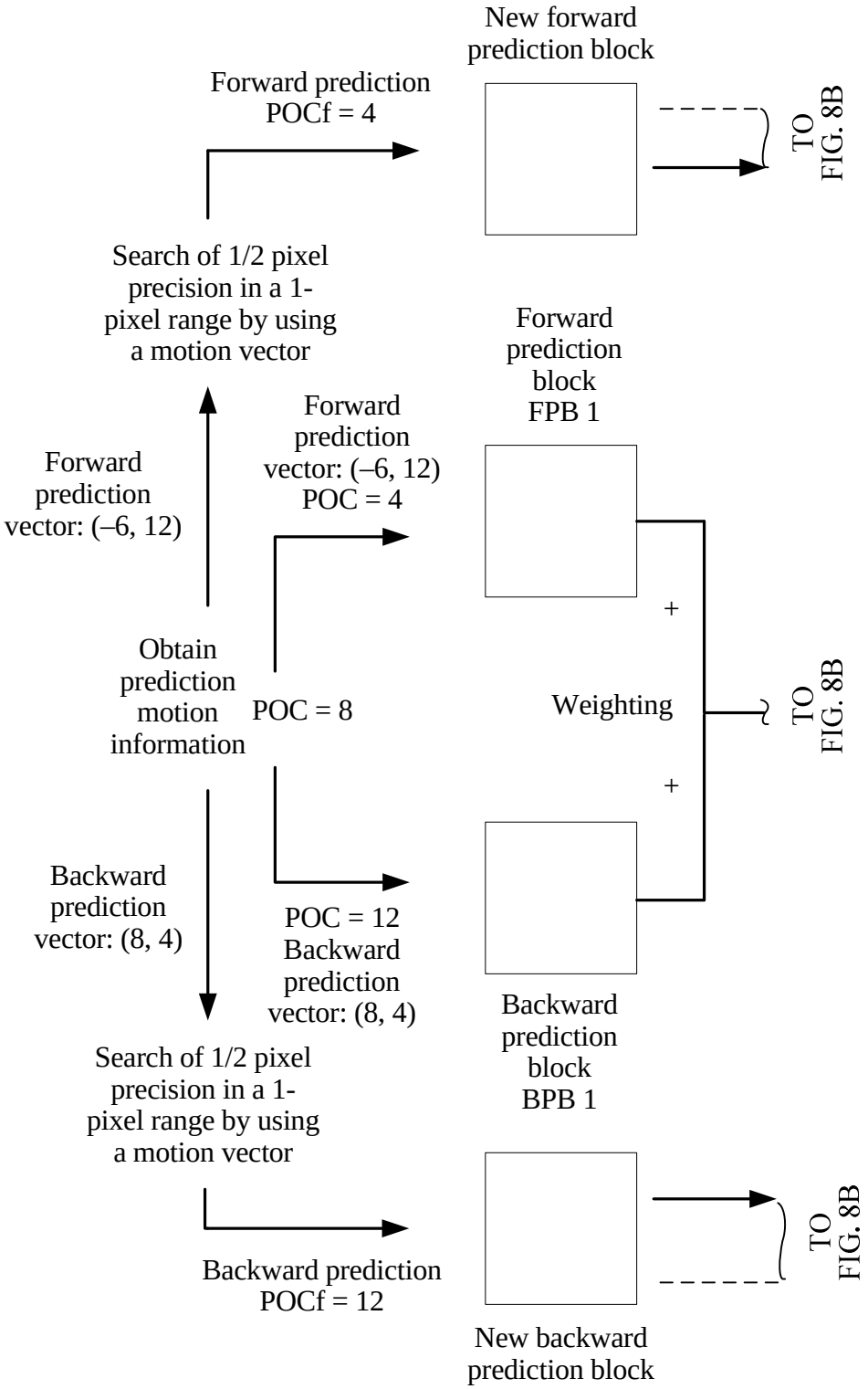
New forward prediction block
Forward prediction POCf = 4
TO FIG. 8B
Search of 1/2 pixel precision in a 1-pixel range by using a motion vector
Forward prediction block FPB 1
Forward prediction vector: (–6, 12)
Forward prediction vector: (–6, 12) POC = 4
+
Obtain prediction motion information
POC = 8
Weighting
TO FIG. 8B
+
Backward prediction vector: (8, 4)
POC = 12 Backward prediction vector: (8, 4)
Backward prediction block BPB 1
Search of 1/2 pixel precision in a 1-pixel range by using a motion vector
Backward prediction POCf = 12
TO FIG. 8B
New backward prediction block

FIG. 8A

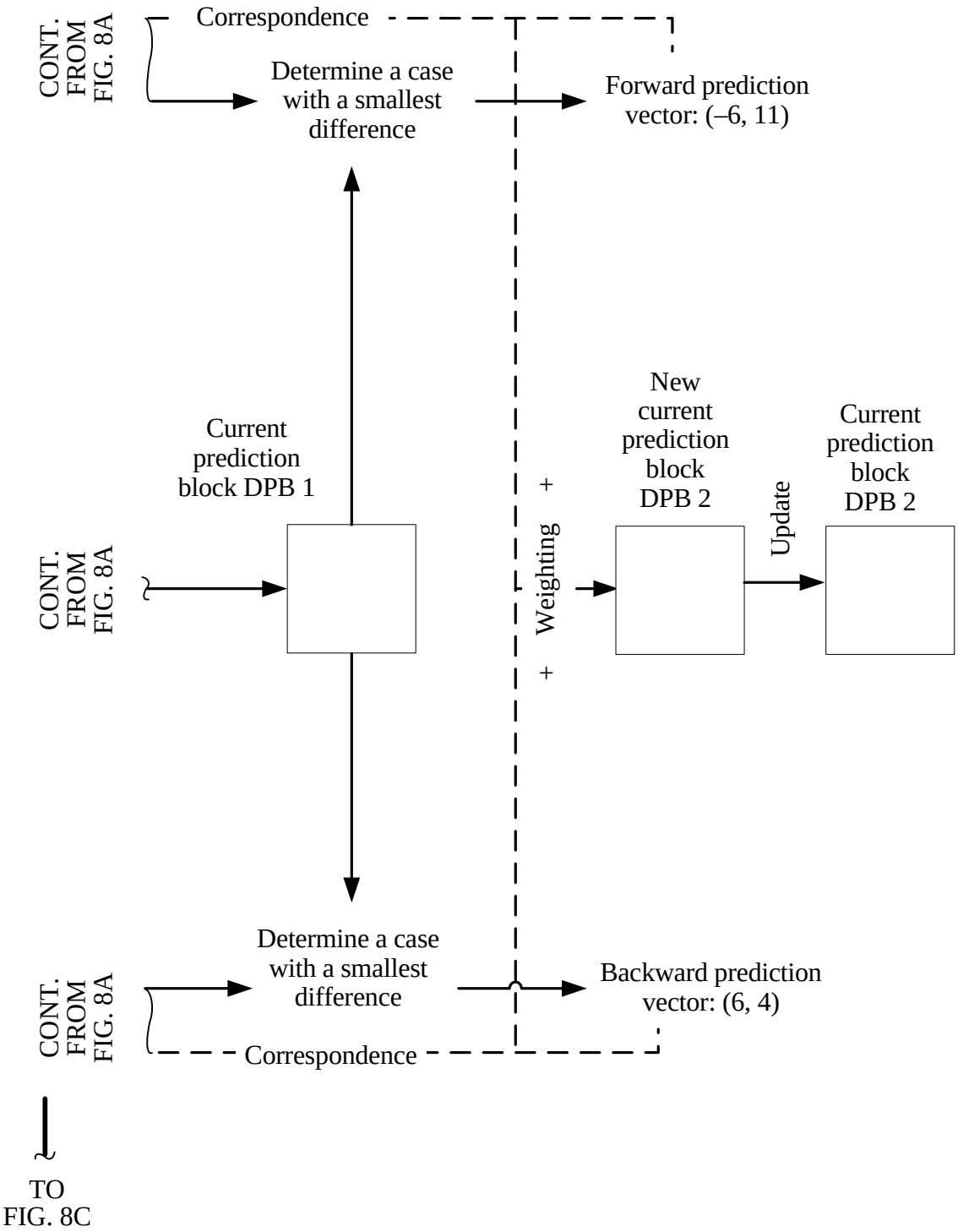
CONT. FROM FIG. 8A
Correspondence
Determine a case with a smallest difference
Forward prediction vector: (–6, 11)
Current prediction block DPB 1
CONT. FROM FIG. 8A
+
Weighting
+
New current prediction block DPB 2
Update
Current prediction block DPB 2
Determine a case with a smallest difference
Backward prediction vector: (6, 4)
CONT. FROM FIG. 8A
Correspondence
TO FIG. 8C

FIG. 8B

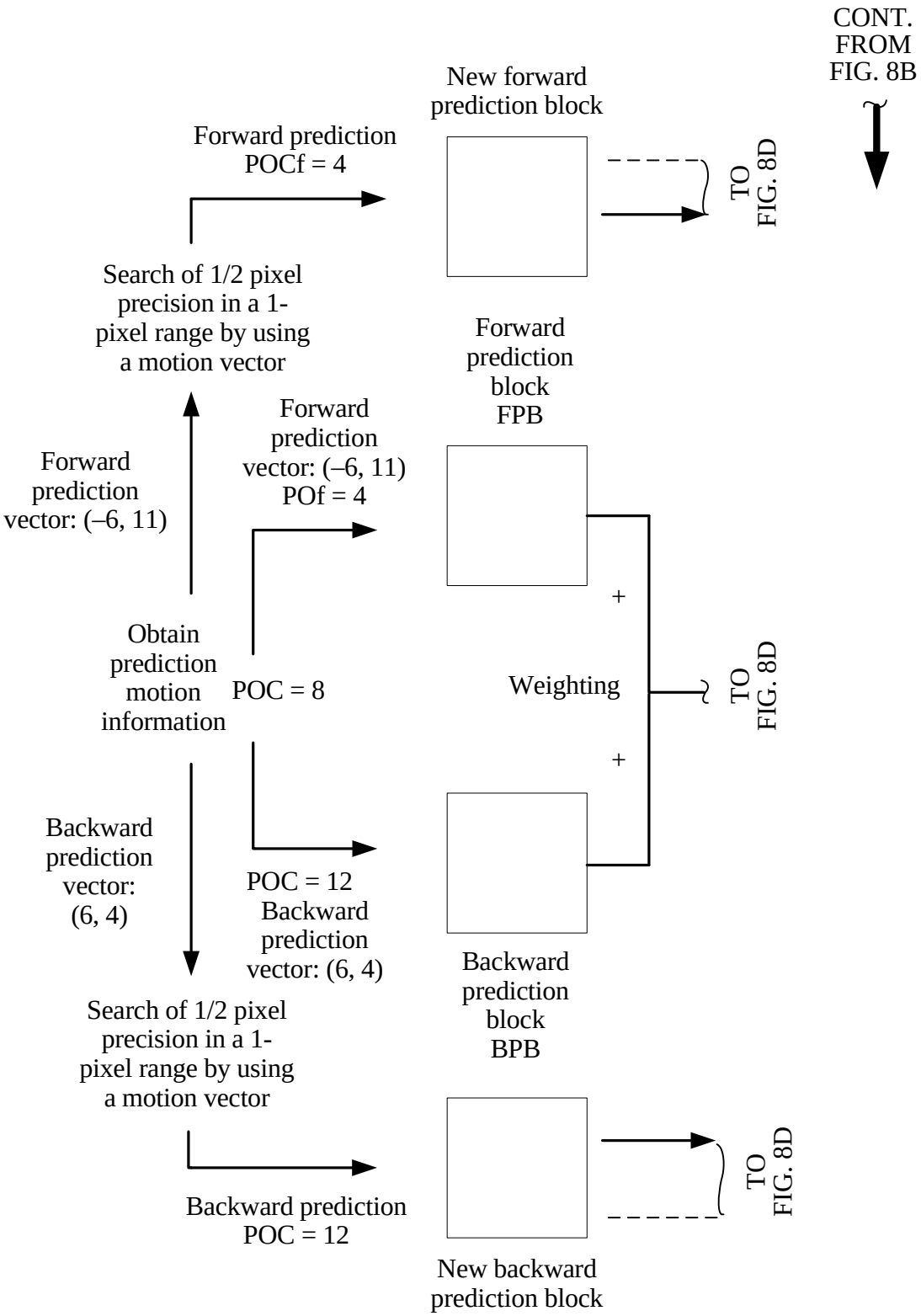
CONT. FROM FIG. 8B
New forward prediction block
Forward prediction POCf = 4
TO FIG. 8D
Search of 1/2 pixel precision in a 1-pixel range by using a motion vector
Forward prediction block FPB
Forward prediction vector: (–6, 11)
Forward prediction vector: (–6, 11) POf = 4
+
Obtain prediction motion information
POC = 8
Weighting
TO FIG. 8D
+
Backward prediction vector: (6, 4)
POC = 12
Backward prediction vector: (6, 4)
Backward prediction block BPB
Search of 1/2 pixel precision in a 1-pixel range by using a motion vector
Backward prediction POC = 12
TO FIG. 8D
New backward prediction block

FIG. 8C

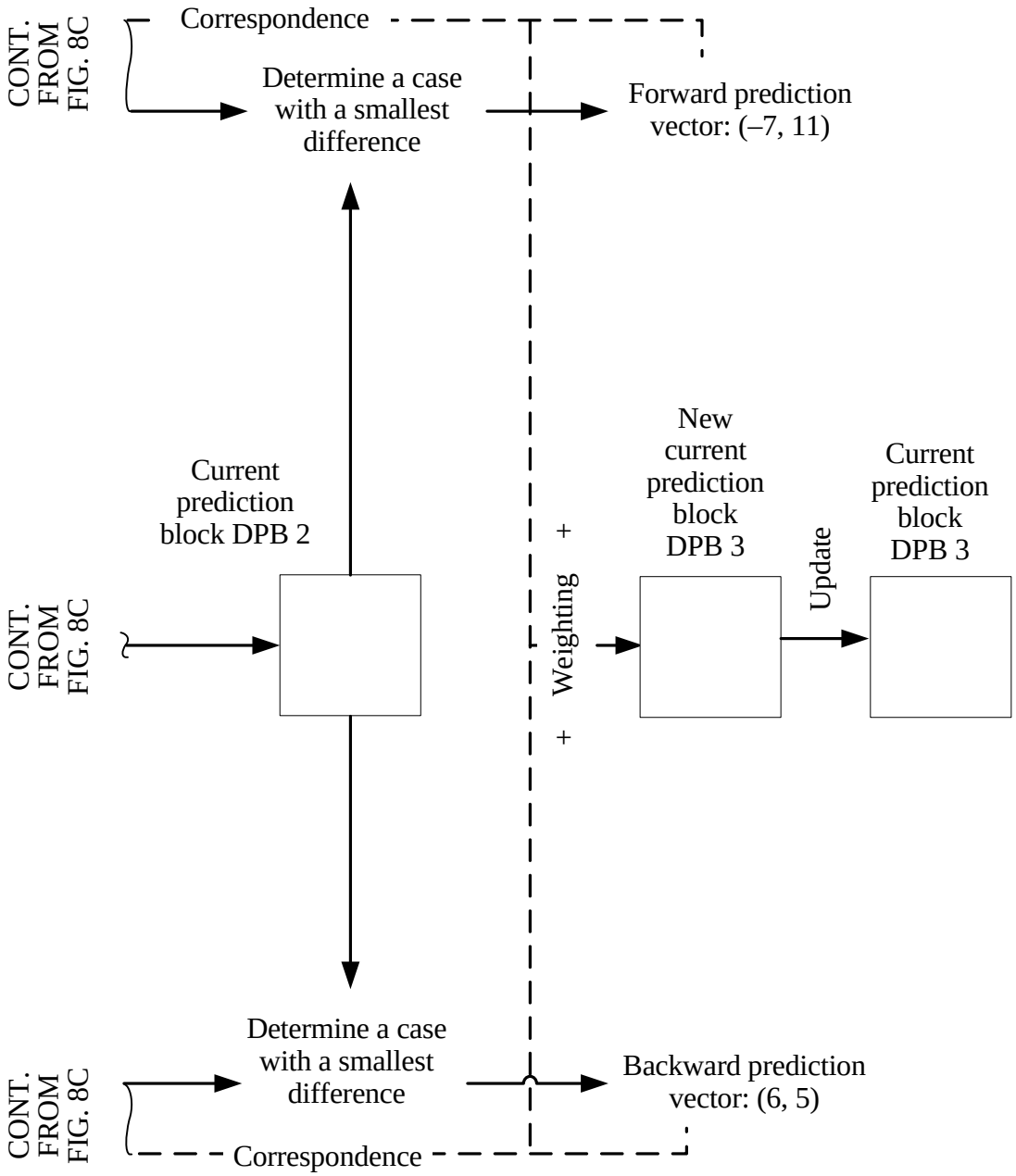
CONT. FROM FIG. 8C
Correspondence
Determine a case with a smallest difference
Forward prediction vector: (–7, 11)
Current prediction block DPB 2
CONT. FROM FIG. 8C
+
Weighting
+
New current prediction block DPB 3
Update
Current prediction block DPB 3
Determine a case with a smallest difference
CONT. FROM FIG. 8C
Backward prediction vector: (6, 5)
Correspondence

FIG. 8D

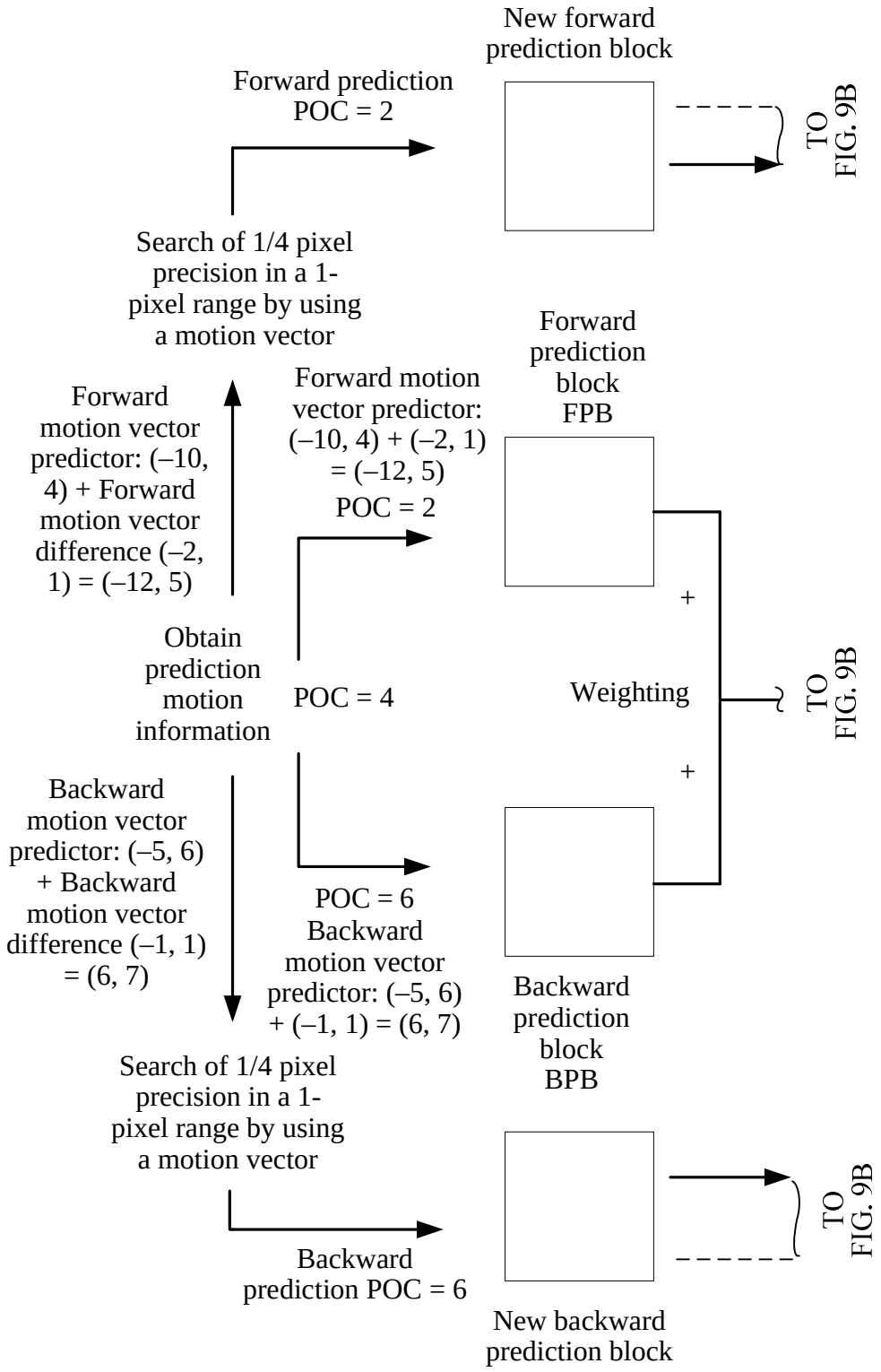
New forward prediction block
Forward prediction POC = 2
TO FIG. 9B
Search of 1/4 pixel precision in a 1-pixel range by using a motion vector
Forward prediction block FPB
Forward motion vector predictor: (–10, 4) + (–2, 1) = (–12, 5)
POC = 2
Forward motion vector predictor: (–10, 4) + Forward motion vector difference (–2, 1) = (–12, 5)
+
Obtain prediction motion information
POC = 4
Weighting
TO FIG. 9B
+
Backward motion vector predictor: (–5, 6) + Backward motion vector difference (–1, 1) = (6, 7)
POC = 6
Backward motion vector predictor: (–5, 6) + (–1, 1) = (6, 7)
Backward prediction block BPB
Search of 1/4 pixel precision in a 1-pixel range by using a motion vector
TO FIG. 9B
Backward prediction POC = 6
New backward prediction block

FIG. 9A

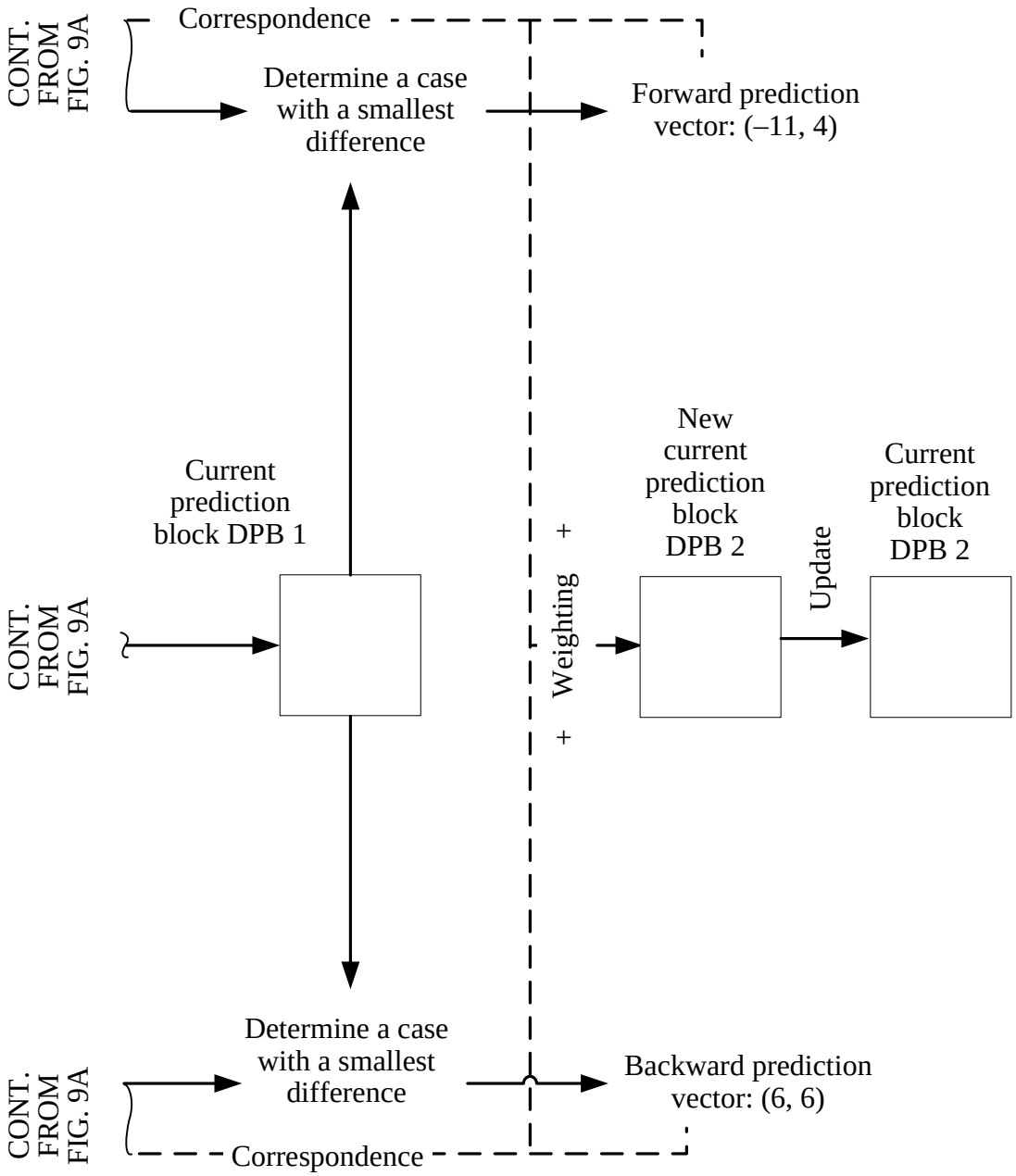
CONT. FROM FIG. 9A
Correspondence
Determine a case with a smallest difference
Forward prediction vector: (–11, 4)
Current prediction block DPB 1
CONT. FROM FIG. 9A
+
Weighting
+
New current prediction block DPB 2
Update
Current prediction block DPB 2
Determine a case with a smallest difference
CONT. FROM FIG. 9A
Backward prediction vector: (6, 6)
Correspondence

FIG. 9B

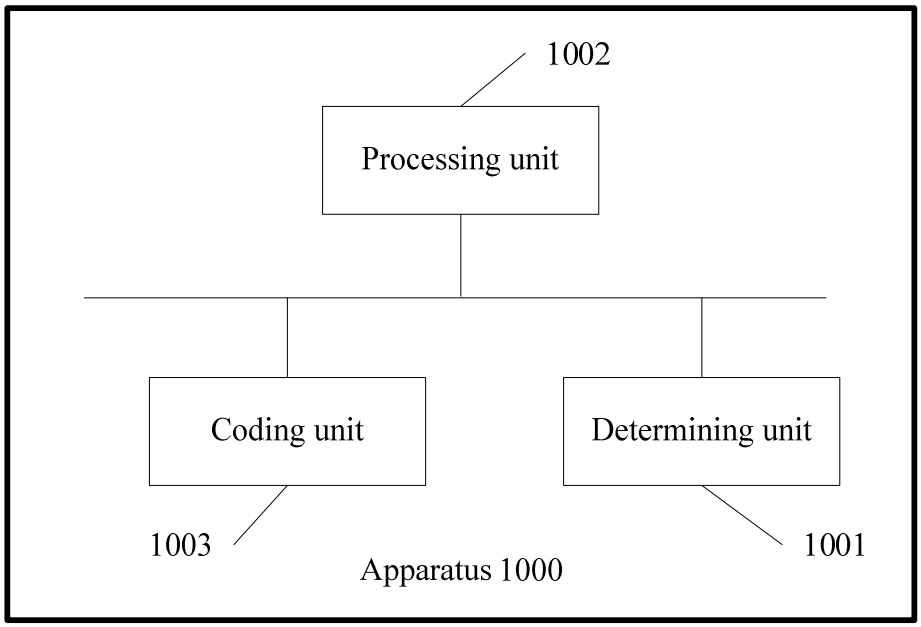
1002
Processing unit
Coding unit
Determining unit
1003
1001
Apparatus 1000

FIG. 10

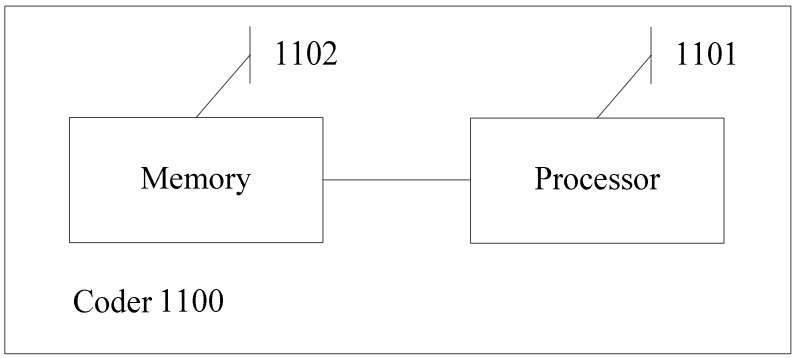
1102
1101
Memory
Processor
Coder 1100

FIG. 11

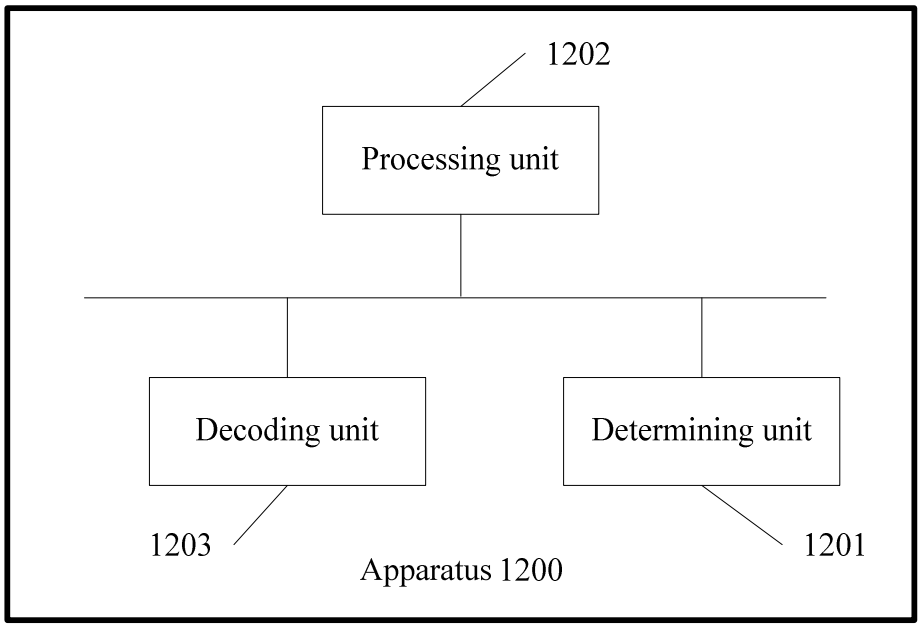
1202
Processing unit
Decoding unit
Determining unit
1203
1201
Apparatus 1200

FIG. 12

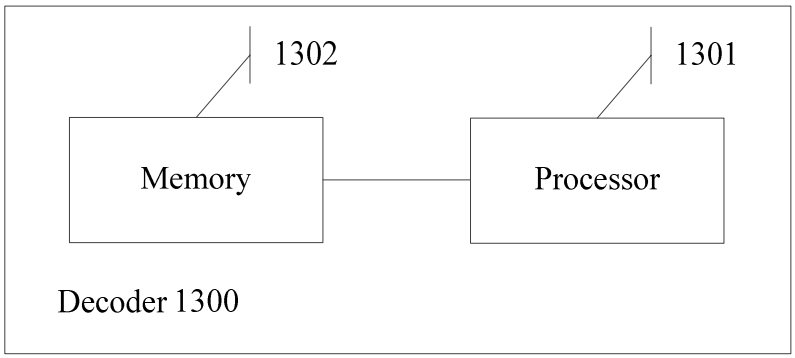
1302
1301
Memory
Processor
Decoder 1300

FIG. 13