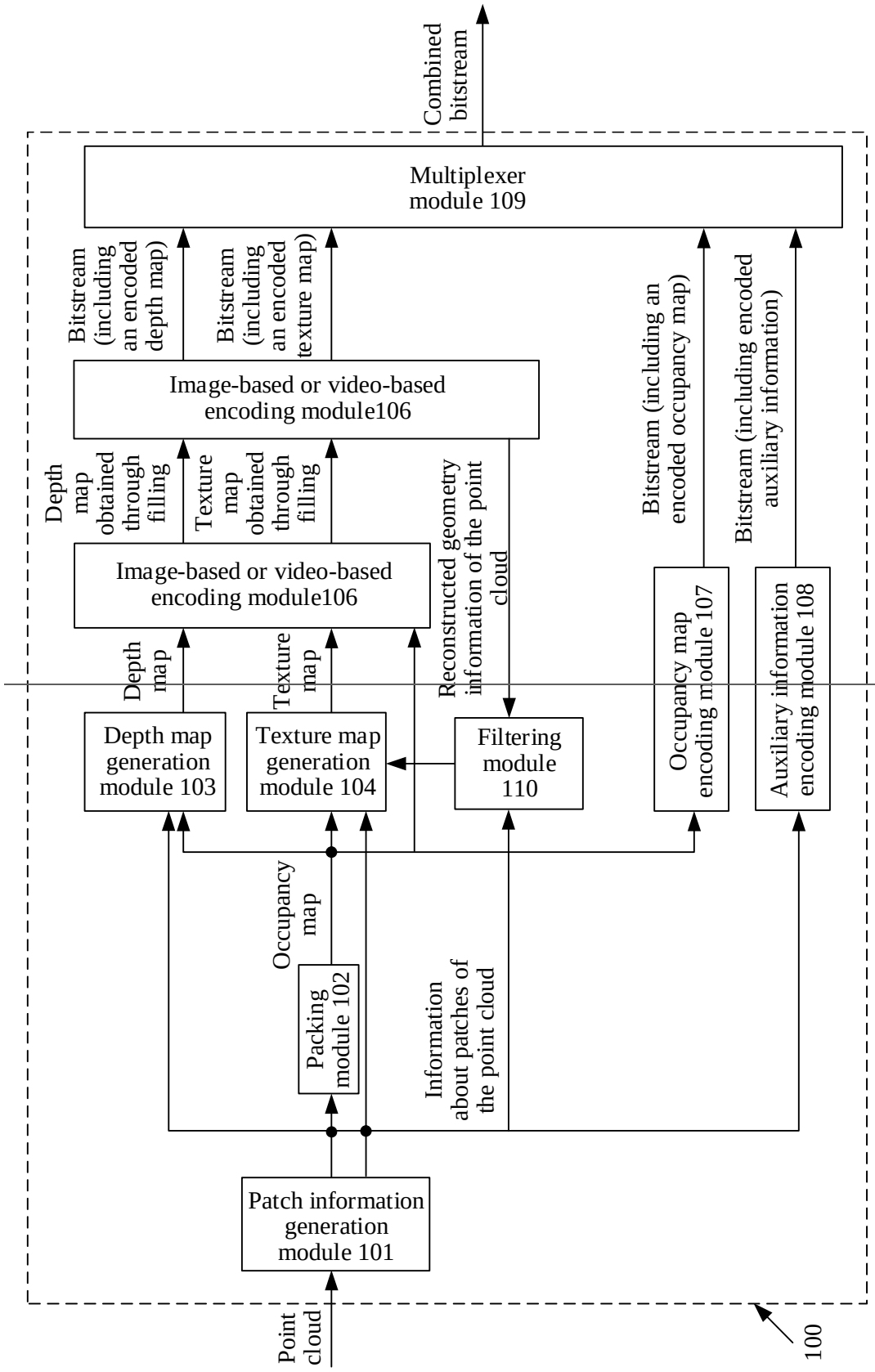

Combined bitstream
Multiplexer module 109
Bitstream (including an encoded depth map)
Bitstream (including an encoded texture map)
Image-based or video-based encoding module106
Depth map obtained through filling
Texture map obtained through filling
Image-based or video-based encoding module106
Reconstructed geometry information of the point cloud
Bitstream (including an encoded occupancy map)
Bitstream (including encoded auxiliary information)
Depth map
Texture map
Depth map generation module 103
Texture map generation module 104
Filtering module 110
Occupancy map encoding module 107
Auxiliary information encoding module 108
Occupancy map
Packing module 102
Information about patches of the point cloud
Patch information generation module 101
Point cloud
100

FIG. 2

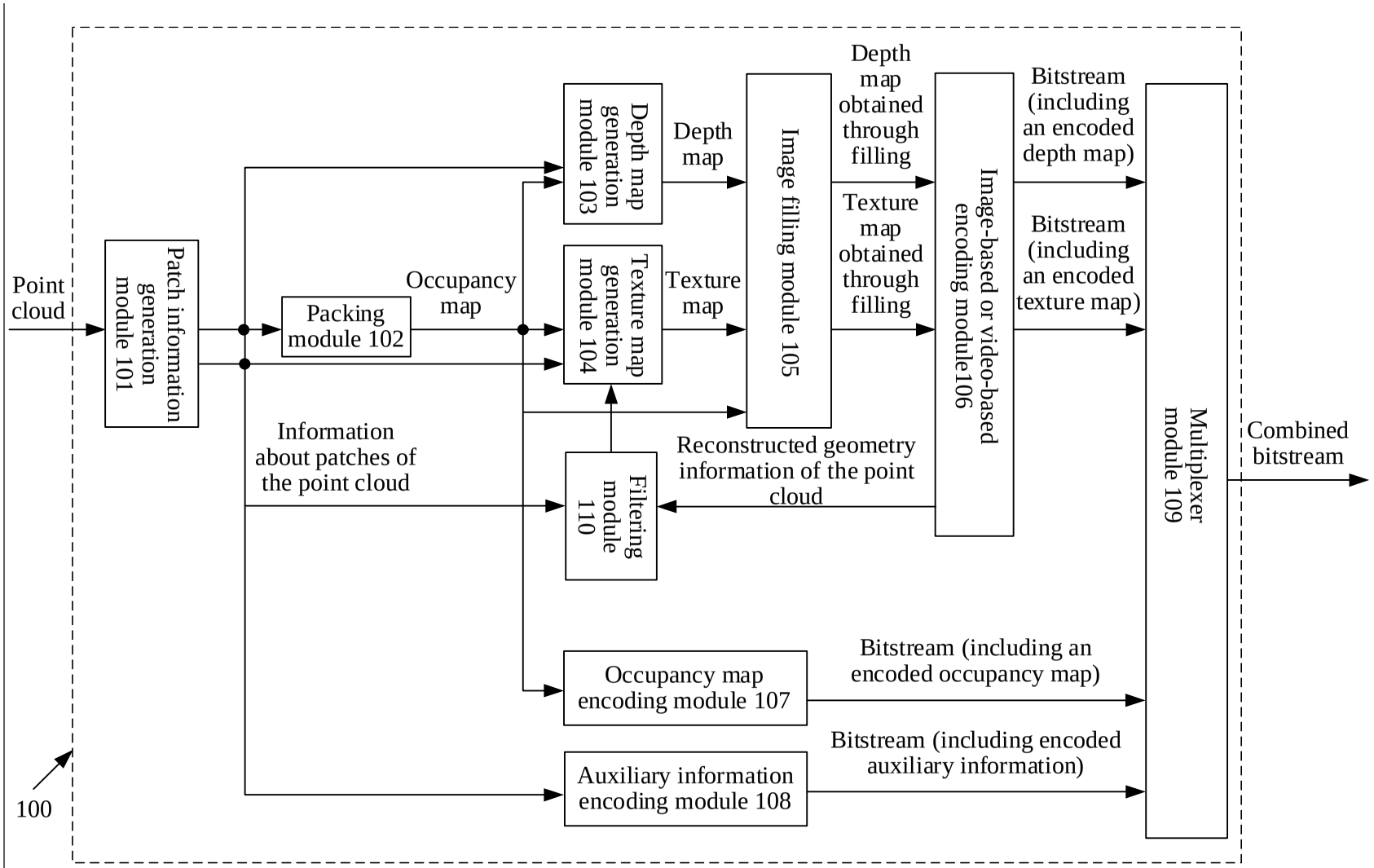

Point cloud
Patch information generation module 101
Packing module 102
Occupancy map
Depth map generation module 103
Texture map generation module 104
Depth map
Texture map
Image filling module 105
Depth map obtained through filling
Texture map obtained through filling
Image-based or video-based encoding module106
Bitstream (including an encoded depth map)
Bitstream (including an encoded texture map)
Multiplexer module 109
Combined bitstream
Information about patches of the point cloud
Filtering module 110
Reconstructed geometry information of the point cloud
Occupancy map encoding module 107
Bitstream (including an encoded occupancy map)
Auxiliary information encoding module 108
Bitstream (including encoded auxiliary information)
100

FIG. 2

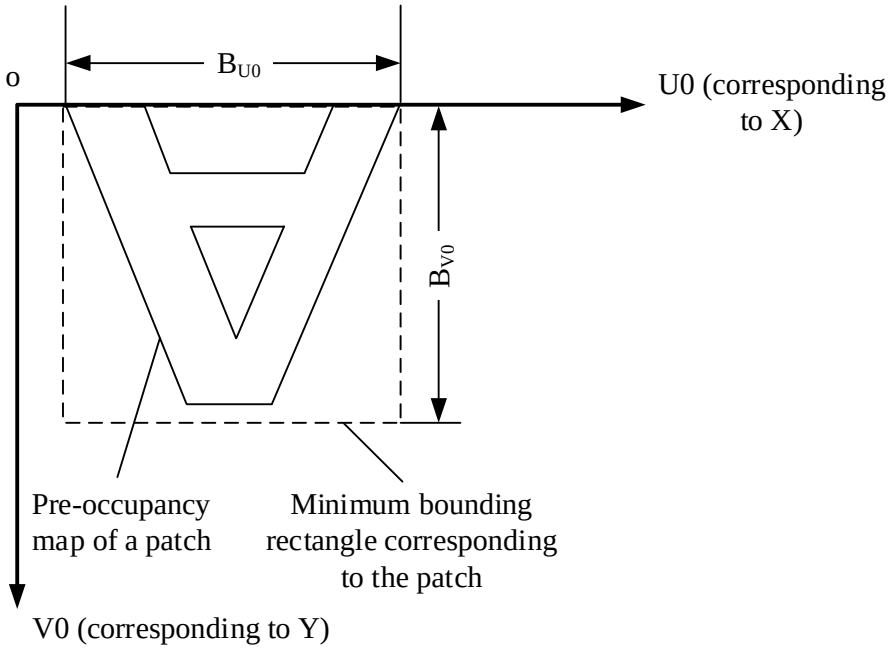
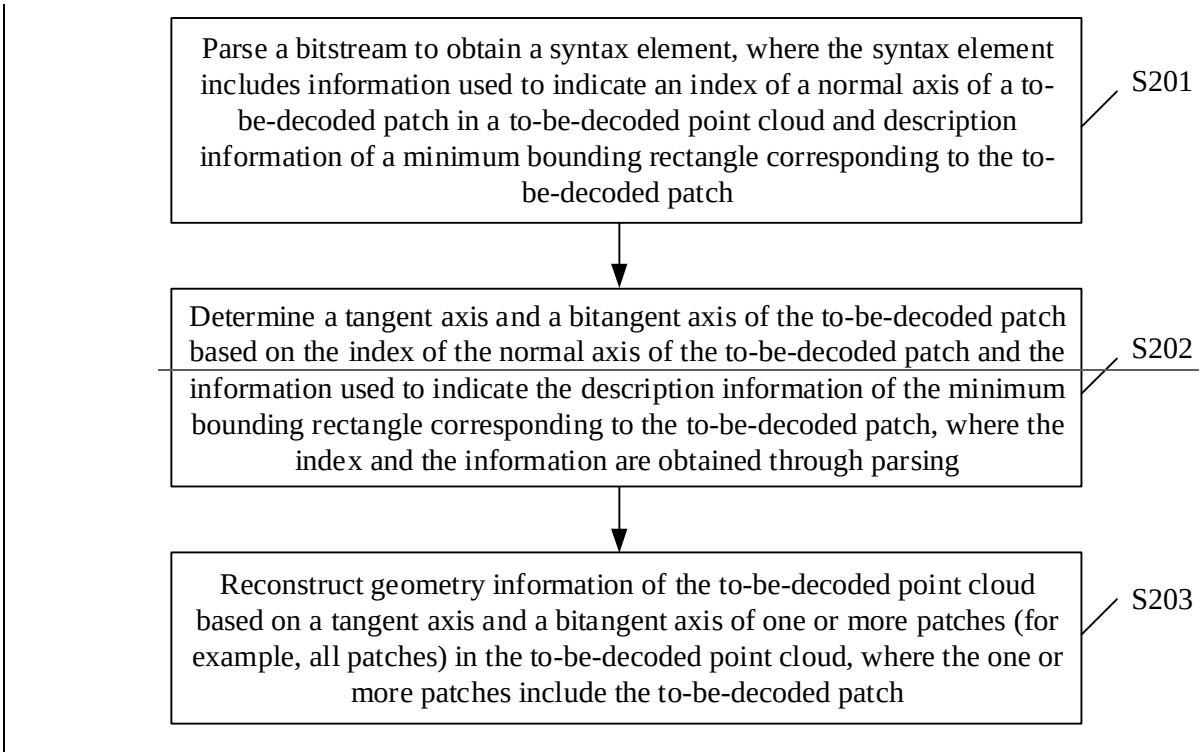
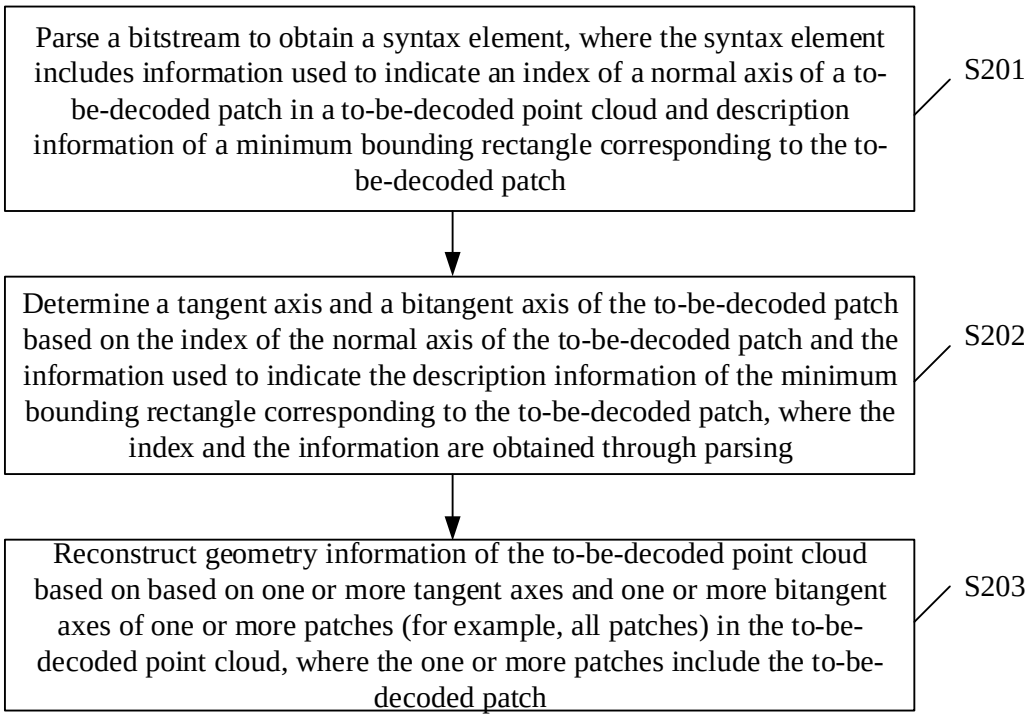

o
B_{U0}
U0 (corresponding to X)
B_{V0}
Pre-occupancy map of a patch
Minimum bounding rectangle corresponding to the patch
V0 (corresponding to Y)

FIG. 11


Parse a bitstream to obtain a syntax element, where the syntax element includes information used to indicate an index of a normal axis of a to-be-decoded patch in a to-be-decoded point cloud and description information of a minimum bounding rectangle corresponding to the to-be-decoded patch
S201
Determine a tangent axis and a bitangent axis of the to-be-decoded patch based on the index of the normal axis of the to-be-decoded patch and the information used to indicate the description information of the minimum bounding rectangle corresponding to the to-be-decoded patch, where the index and the information are obtained through parsing
S202
Reconstruct geometry information of the to-be-decoded point cloud based on a tangent axis and a bitangent axis of one or more patches (for example, all patches) in the to-be-decoded point cloud, where the one or more patches include the to-be-decoded patch
S203


Parse a bitstream to obtain a syntax element, where the syntax element includes information used to indicate an index of a normal axis of a to-be-decoded patch in a to-be-decoded point cloud and description information of a minimum bounding rectangle corresponding to the to-be-decoded patch
S201
Determine a tangent axis and a bitangent axis of the to-be-decoded patch based on the index of the normal axis of the to-be-decoded patch and the information used to indicate the description information of the minimum bounding rectangle corresponding to the to-be-decoded patch, where the index and the information are obtained through parsing
S202
Reconstruct geometry information of the to-be-decoded point cloud based on based on one or more tangent axes and one or more bitangent axes of one or more patches (for example, all patches) in the to-be-decoded point cloud, where the one or more patches include the to-be-decoded patch
S203

~~FIG. 12~~

FIG. 12

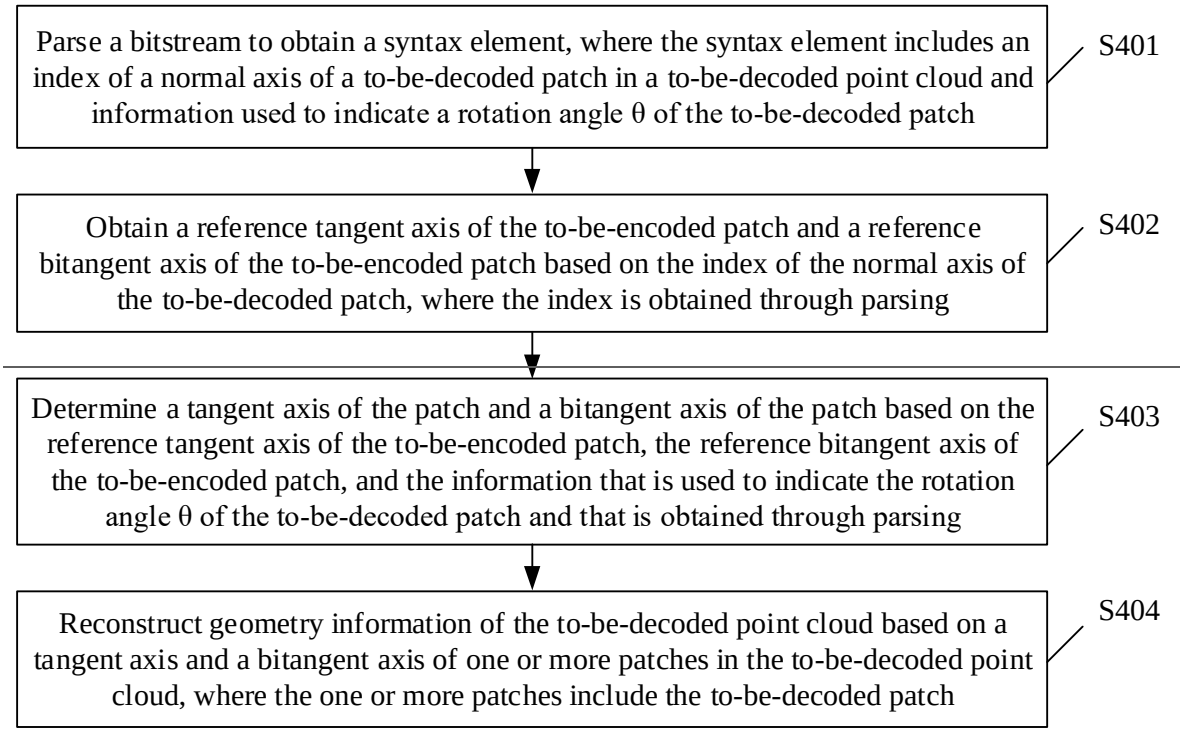

Parse a bitstream to obtain a syntax element, where the syntax element includes an index of a normal axis of a to-be-decoded patch in a to-be-decoded point cloud and information used to indicate a rotation angle θ of the to-be-decoded patch
S401
Obtain a reference tangent axis of the to-be-encoded patch and a reference bitangent axis of the to-be-encoded patch based on the index of the normal axis of the to-be-decoded patch, where the index is obtained through parsing
S402
Determine a tangent axis of the patch and a bitangent axis of the patch based on the reference tangent axis of the to-be-encoded patch, the reference bitangent axis of the to-be-encoded patch, and the information that is used to indicate the rotation angle θ of the to-be-decoded patch and that is obtained through parsing
S403
Reconstruct geometry information of the to-be-decoded point cloud based on a tangent axis and a bitangent axis of one or more patches in the to-be-decoded point cloud, where the one or more patches include the to-be-decoded patch
S404

FIG. 15

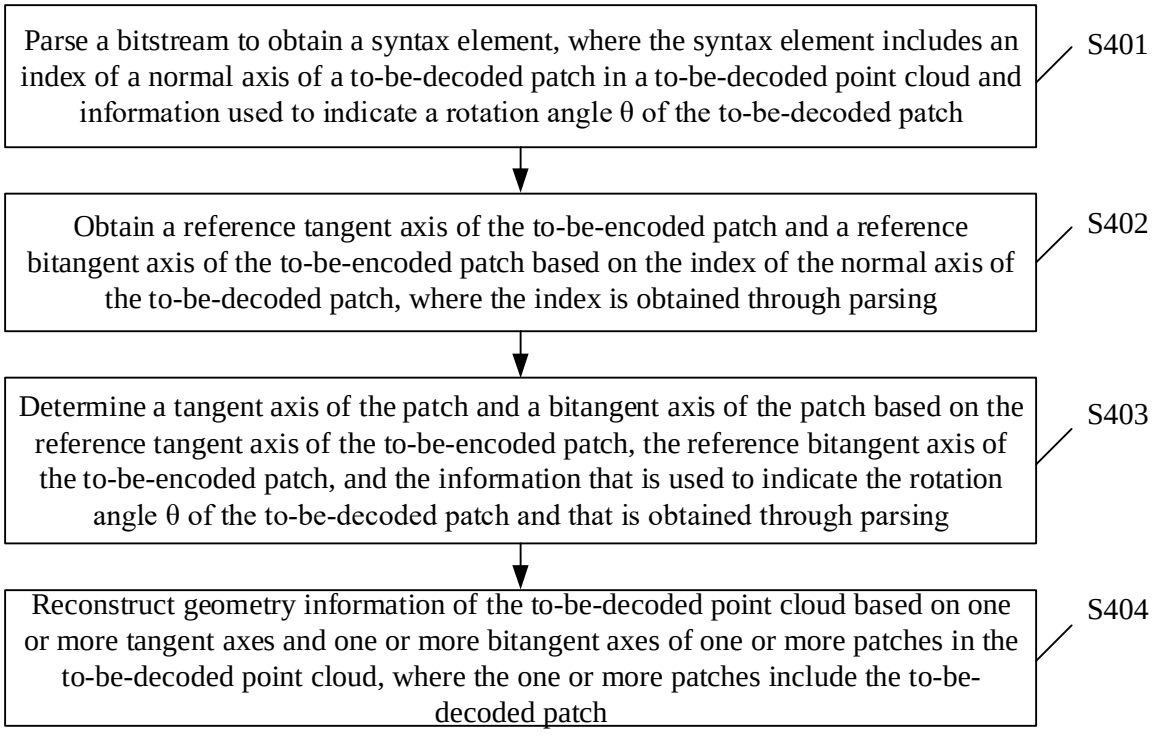

Parse a bitstream to obtain a syntax element, where the syntax element includes an index of a normal axis of a to-be-decoded patch in a to-be-decoded point cloud and information used to indicate a rotation angle θ of the to-be-decoded patch
S401
Obtain a reference tangent axis of the to-be-encoded patch and a reference bitangent axis of the to-be-encoded patch based on the index of the normal axis of the to-be-decoded patch, where the index is obtained through parsing
S402
Determine a tangent axis of the patch and a bitangent axis of the patch based on the reference tangent axis of the to-be-encoded patch, the reference bitangent axis of the to-be-encoded patch, and the information that is used to indicate the rotation angle θ of the to-be-decoded patch and that is obtained through parsing
S403
Reconstruct geometry information of the to-be-decoded point cloud based on one or more tangent axes and one or more bitangent axes of one or more patches in the to-be-decoded point cloud, where the one or more patches include the to-be-decoded patch
S404

FIG. 15

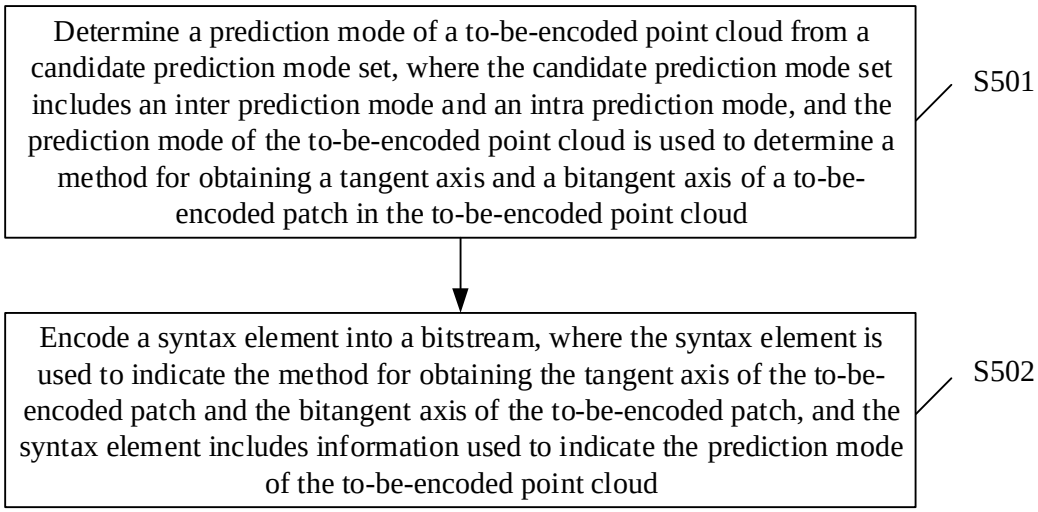

Determine a prediction mode of a to-be-encoded point cloud from a candidate prediction mode set, where the candidate prediction mode set includes an inter prediction mode and an intra prediction mode, and the prediction mode of the to-be-encoded point cloud is used to determine a method for obtaining a tangent axis and a bitangent axis of a to-be-encoded patch in the to-be-encoded point cloud
S501
Encode a syntax element into a bitstream, where the syntax element is used to indicate the method for obtaining the tangent axis of the to-be-encoded patch and the bitangent axis of the to-be-encoded patch, and the syntax element includes information used to indicate the prediction mode of the to-be-encoded point cloud
S502

FIG. 16