

FIG. 1

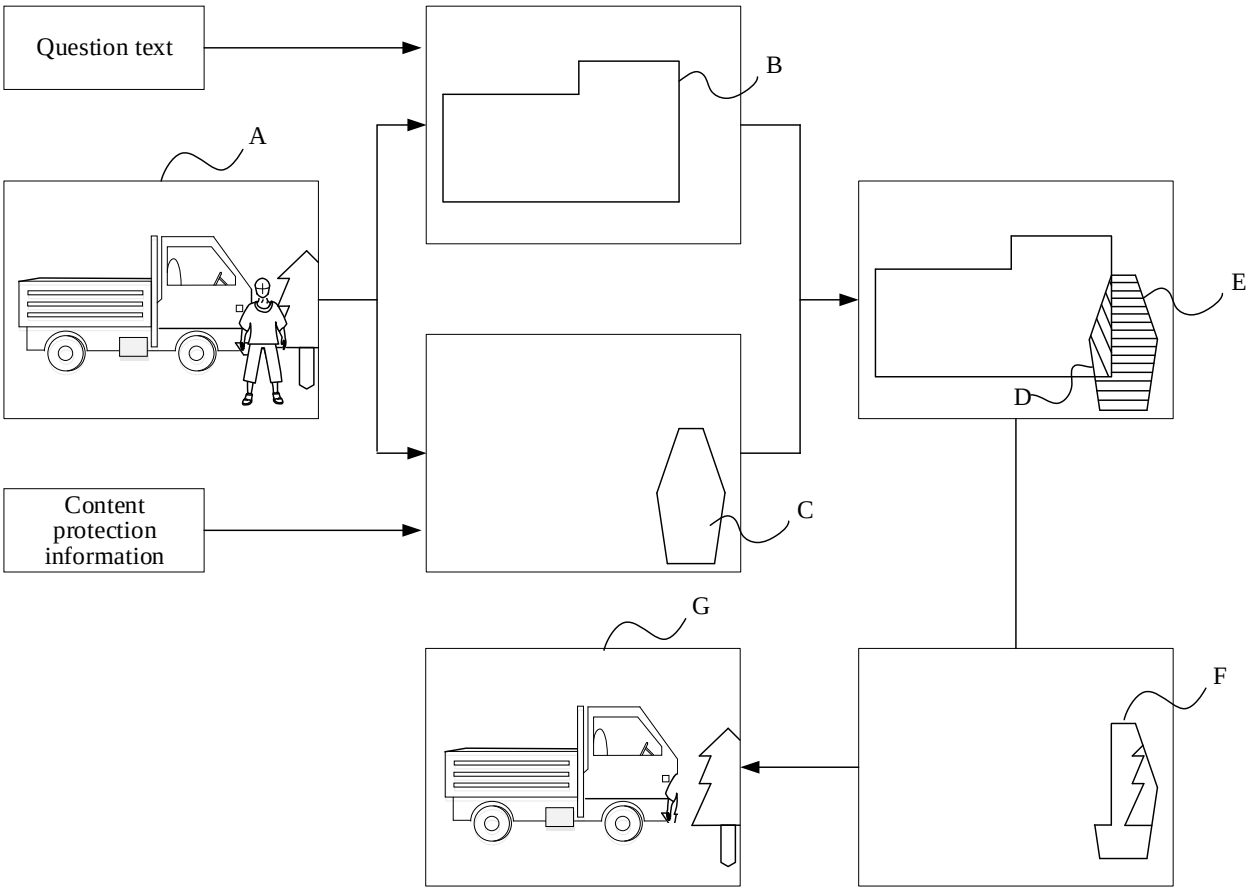


FIG. 2

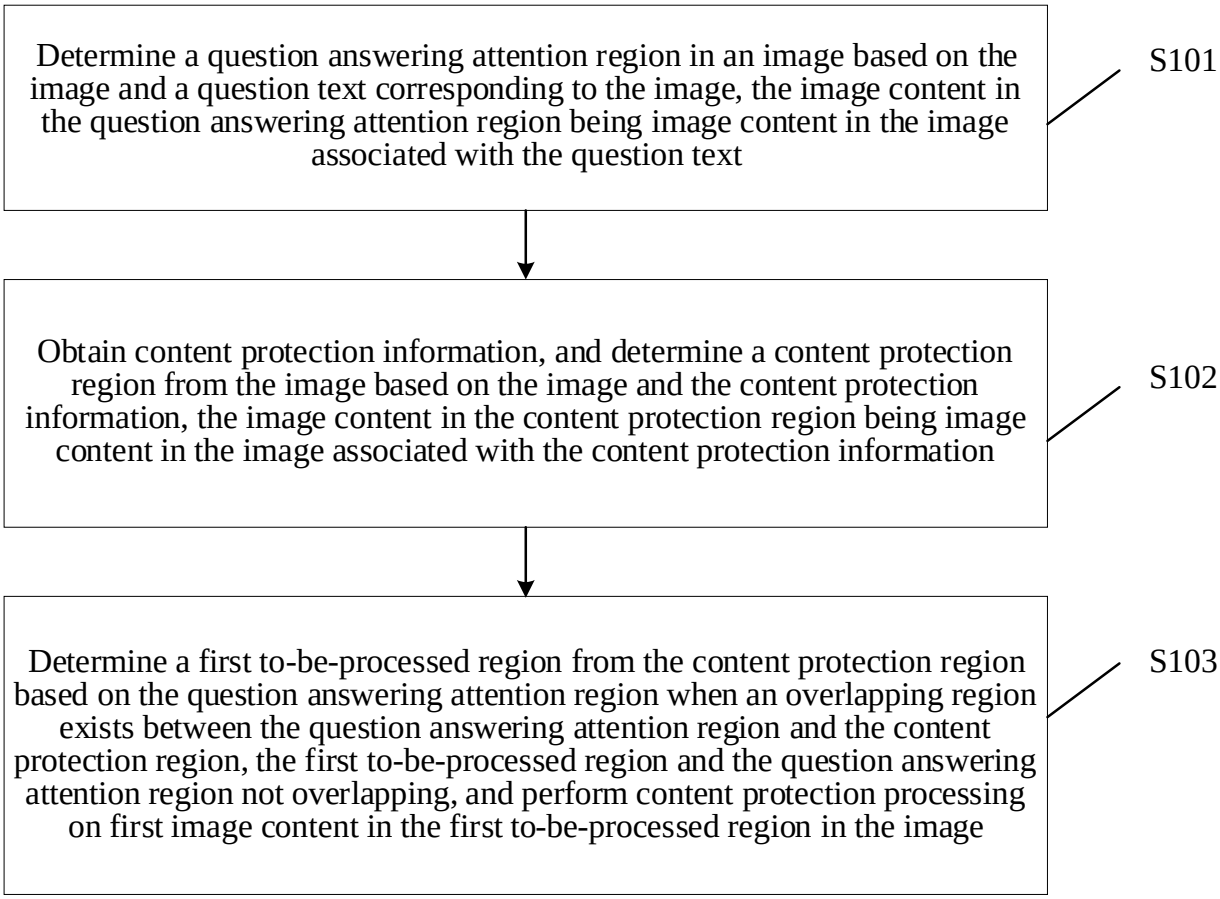

Determine a question answering attention region in an image based on the image and a question text corresponding to the image, the image content in the question answering attention region being image content in the image associated with the question text
S101
Obtain content protection information, and determine a content protection region from the image based on the image and the content protection information, the image content in the content protection region being image content in the image associated with the content protection information
S102
Determine a first to-be-processed region from the content protection region based on the question answering attention region when an overlapping region exists between the question answering attention region and the content protection region, the first to-be-processed region and the question answering attention region not overlapping, and perform content protection processing on first image content in the first to-be-processed region in the image
S103

FIG. 3

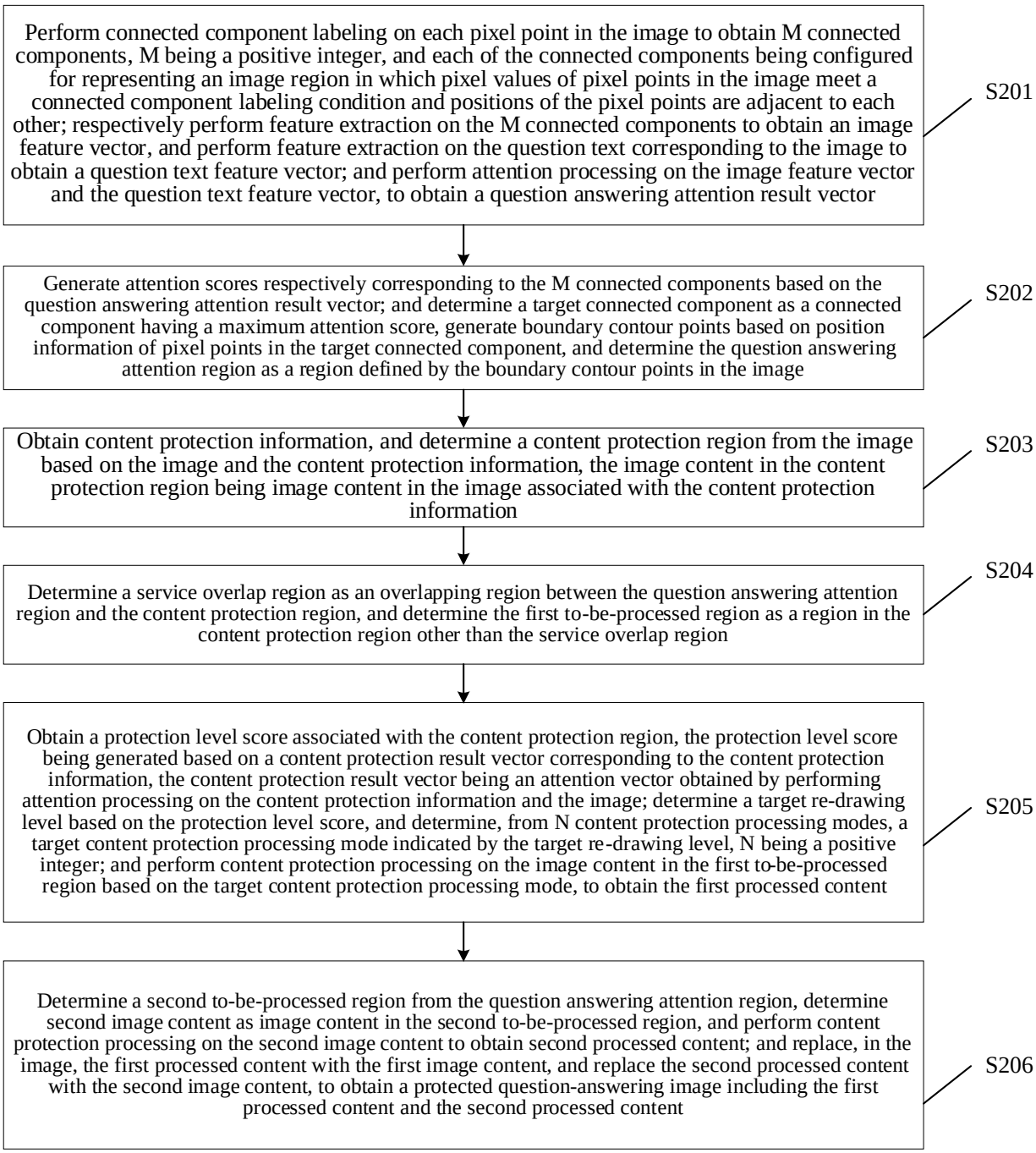

Perform connected component labeling on each pixel point in the image to obtain M connected components, M being a positive integer, and each of the connected components being configured for representing an image region in which pixel values of pixel points in the image meet a connected component labeling condition and positions of the pixel points are adjacent to each other; respectively perform feature extraction on the M connected components to obtain an image feature vector, and perform feature extraction on the question text corresponding to the image to obtain a question text feature vector; and perform attention processing on the image feature vector and the question text feature vector, to obtain a question answering attention result vector
S201
Generate attention scores respectively corresponding to the M connected components based on the question answering attention result vector; and determine a target connected component as a connected component having a maximum attention score, generate boundary contour points based on position information of pixel points in the target connected component, and determine the question answering attention region as a region defined by the boundary contour points in the image
S202
Obtain content protection information, and determine a content protection region from the image based on the image and the content protection information, the image content in the content protection region being image content in the image associated with the content protection information
S203
Determine a service overlap region as an overlapping region between the question answering attention region and the content protection region, and determine the first to-be-processed region as a region in the content protection region other than the service overlap region
S204
Obtain a protection level score associated with the content protection region, the protection level score being generated based on a content protection result vector corresponding to the content protection information, the content protection result vector being an attention vector obtained by performing attention processing on the content protection information and the image; determine a target re-drawing level based on the protection level score, and determine, from N content protection processing modes, a target content protection processing mode indicated by the target re-drawing level, N being a positive integer; and perform content protection processing on the image content in the first to-be-processed region based on the target content protection processing mode, to obtain the first processed content
S205
Determine a second to-be-processed region from the question answering attention region, determine second image content as image content in the second to-be-processed region, and perform content protection processing on the second image content to obtain second processed content; and replace, in the image, the first processed content with the first image content, and replace the second processed content with the second image content, to obtain a protected question-answering image including the first processed content and the second processed content
S206

FIG. 4

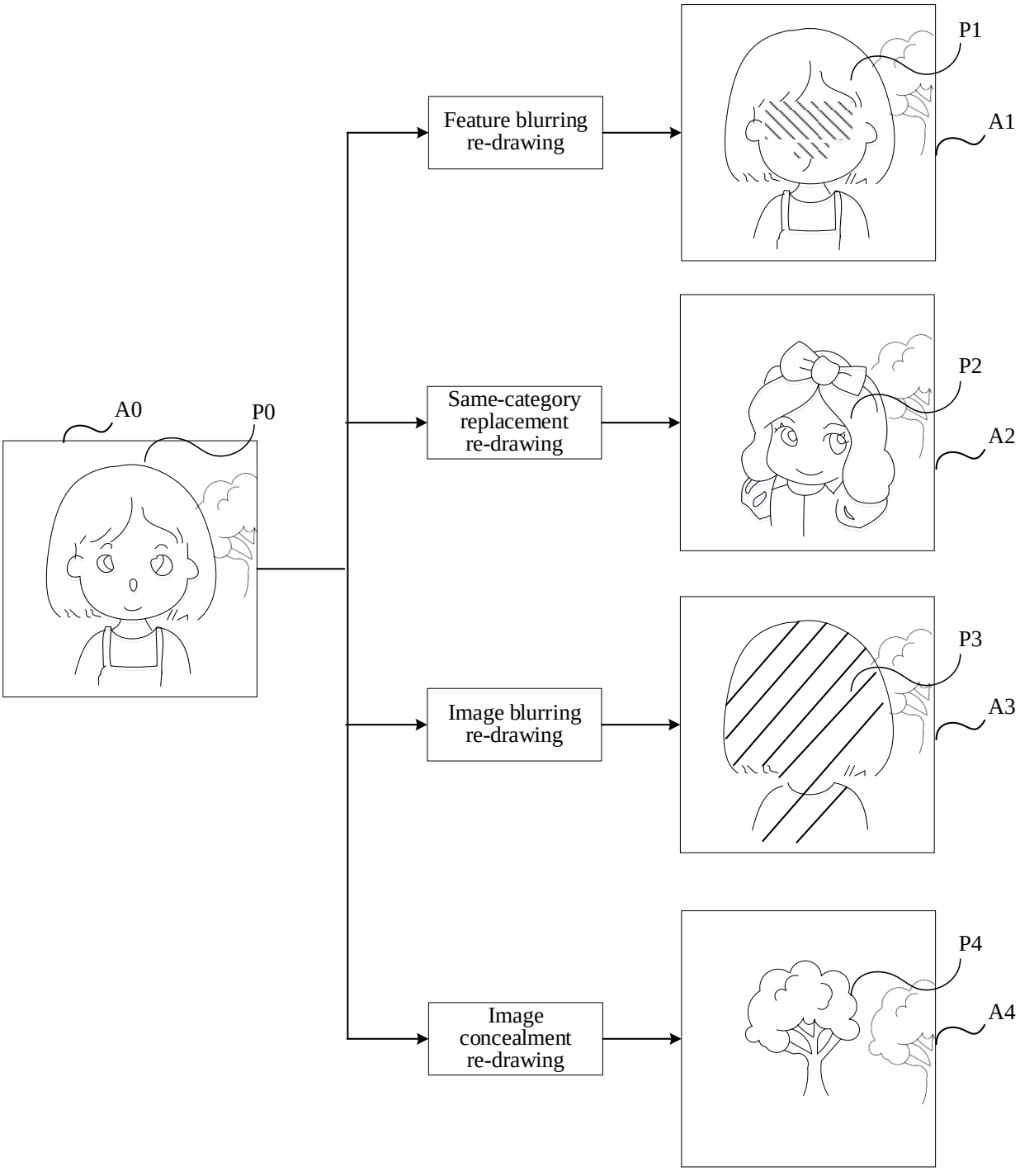

A0
P0
Feature blurring re-drawing
Same-category replacement re-drawing
Image blurring re-drawing
Image concealment re-drawing
P1
A1
P2
A2
P3
A3
P4
A4

FIG. 5

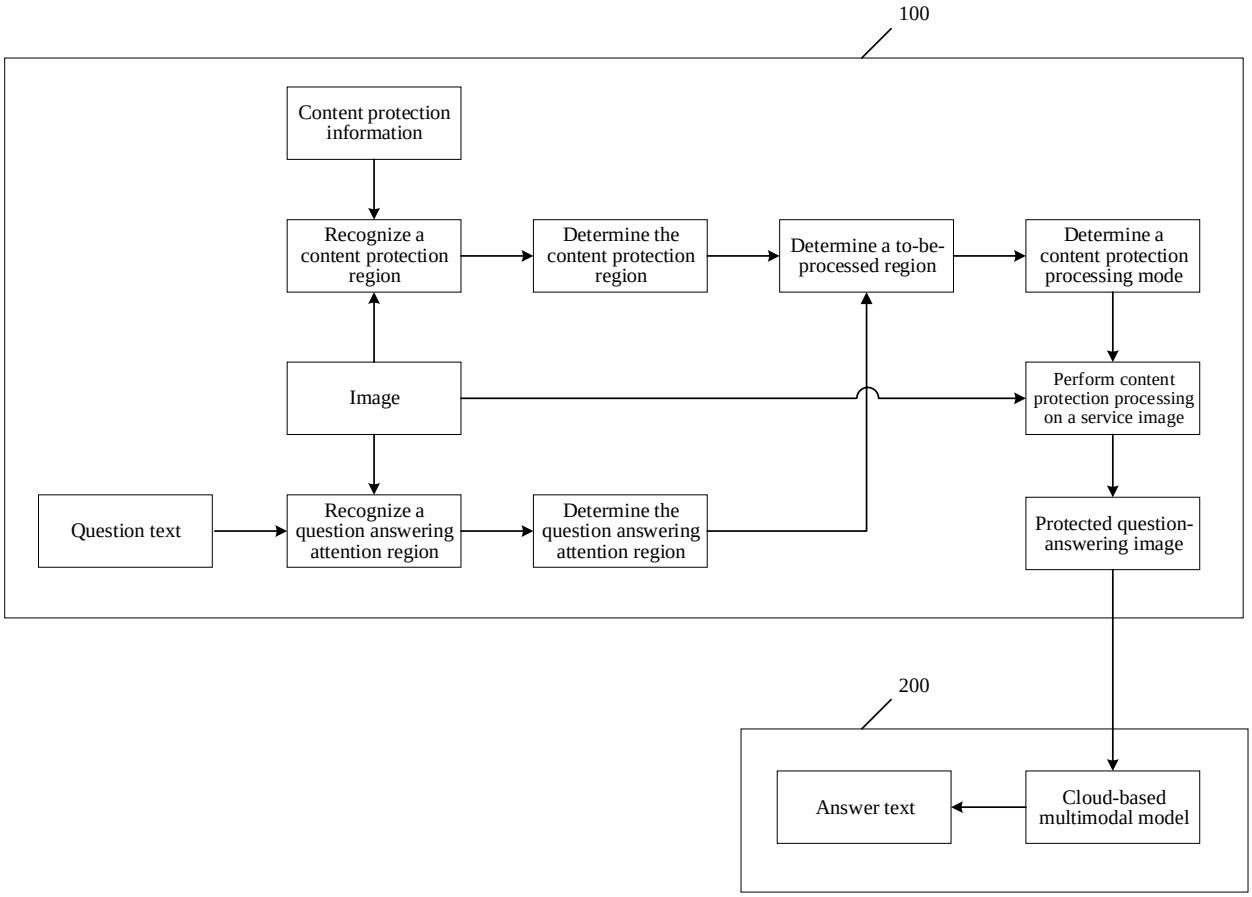

100
Content protection information
Recognize a content protection region
Determine the content protection region
Determine a to-be-processed region
Determine a content protection processing mode
Image
Perform content protection processing on a service image
Question text
Recognize a question answering attention region
Determine the question answering attention region
Protected question-answering image
200
Answer text
Cloud-based multimodal model

FIG. 6

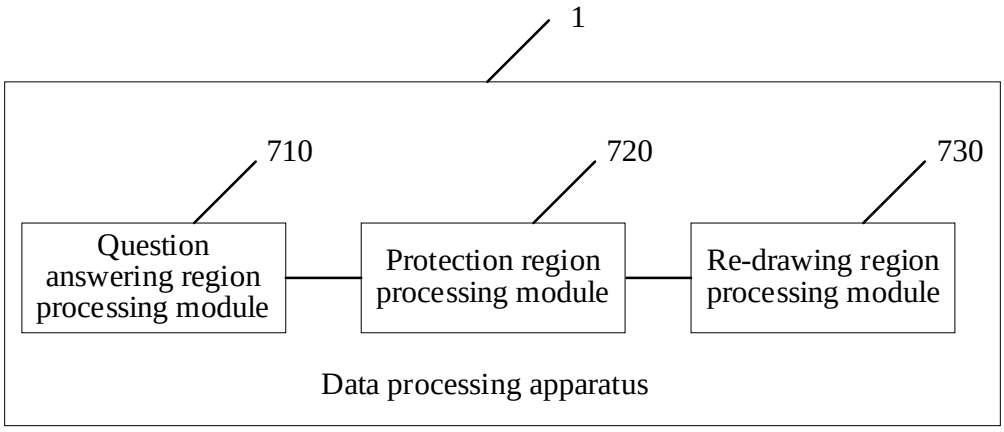

1
710
720
730
Question answering region processing module
Protection region processing module
Re-drawing region processing module
Data processing apparatus

FIG. 7

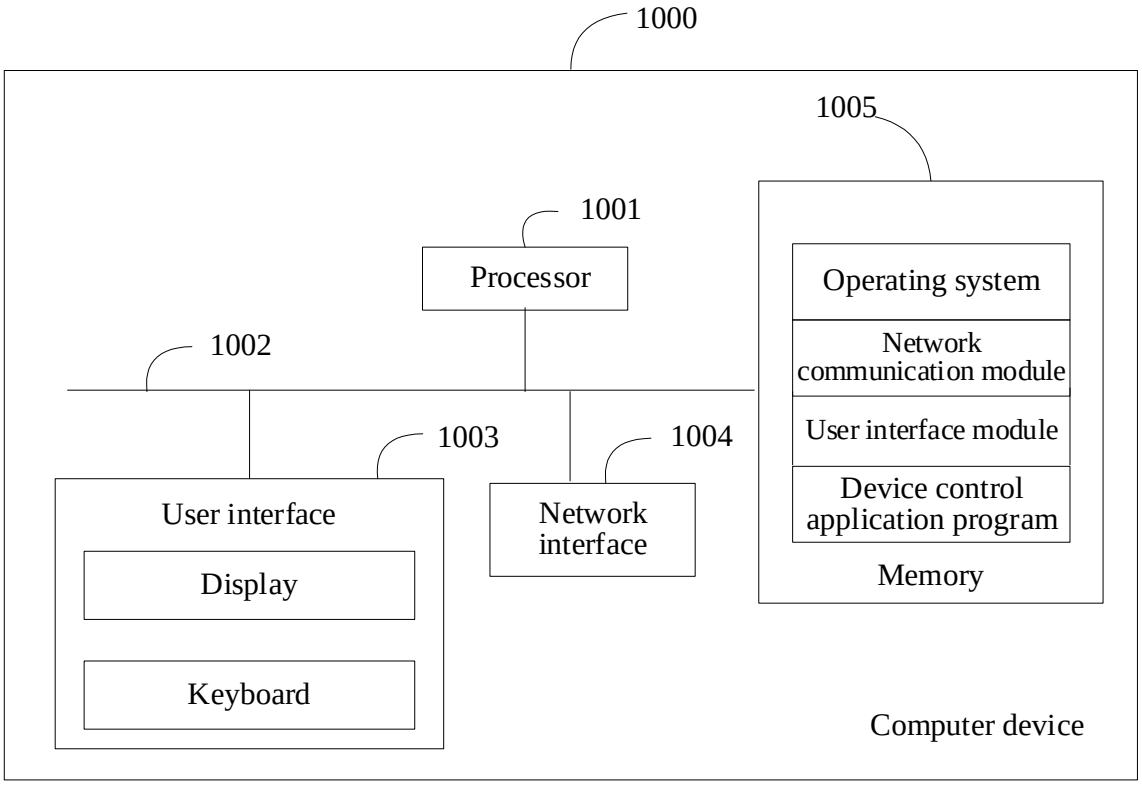

1000
1005
1001
Processor
Operating system
Network communication module
User interface module
Device control application program
Memory
1002
1003
1004
User interface
Display
Keyboard
Network interface
Computer device

FIG. 8