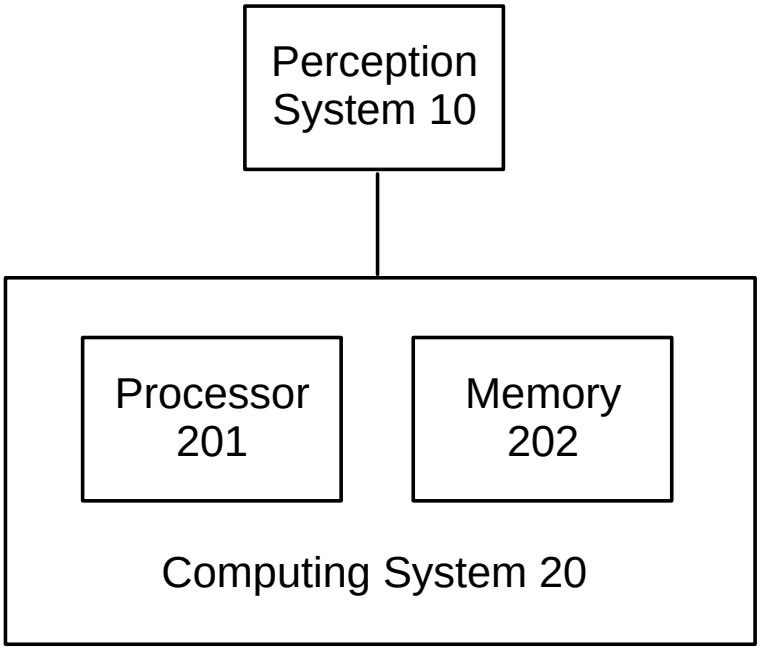

Perception System 10
Processor 201
Memory 202
Computing System 20

FIG. 1

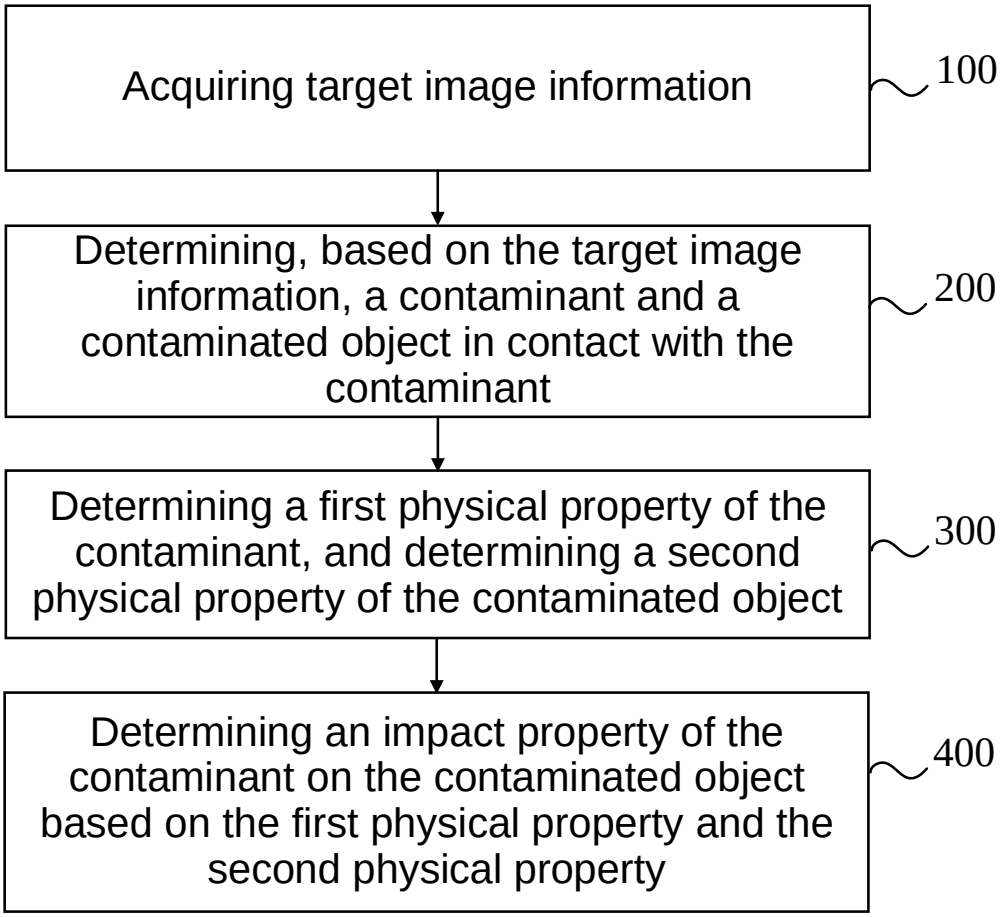

Acquiring target image information
100
Determining, based on the target image information, a contaminant and a contaminated object in contact with the contaminant
200
Determining a first physical property of the contaminant, and determining a second physical property of the contaminated object
300
Determining an impact property of the contaminant on the contaminated object based on the first physical property and the second physical property
400

FIG. 2

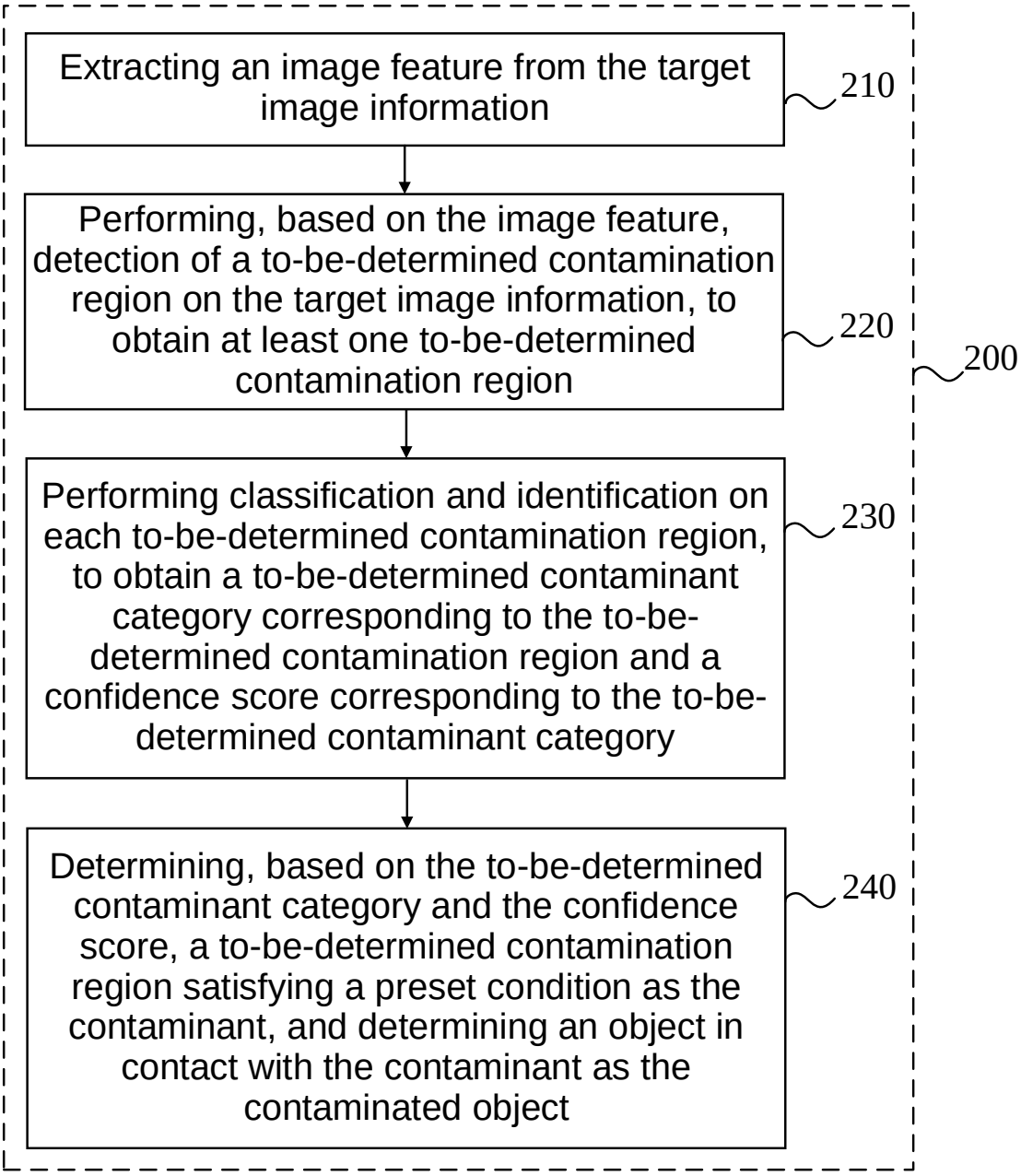

Extracting an image feature from the target image information
210
Performing, based on the image feature, detection of a to-be-determined contamination region on the target image information, to obtain at least one to-be-determined contamination region
220
200
Performing classification and identification on each to-be-determined contamination region, to obtain a to-be-determined contaminant category corresponding to the to-be-determined contamination region and a confidence score corresponding to the to-be-determined contaminant category
230
Determining, based on the to-be-determined contaminant category and the confidence score, a to-be-determined contamination region satisfying a preset condition as the contaminant, and determining an object in contact with the contaminant as the contaminated object
240

FIG. 3

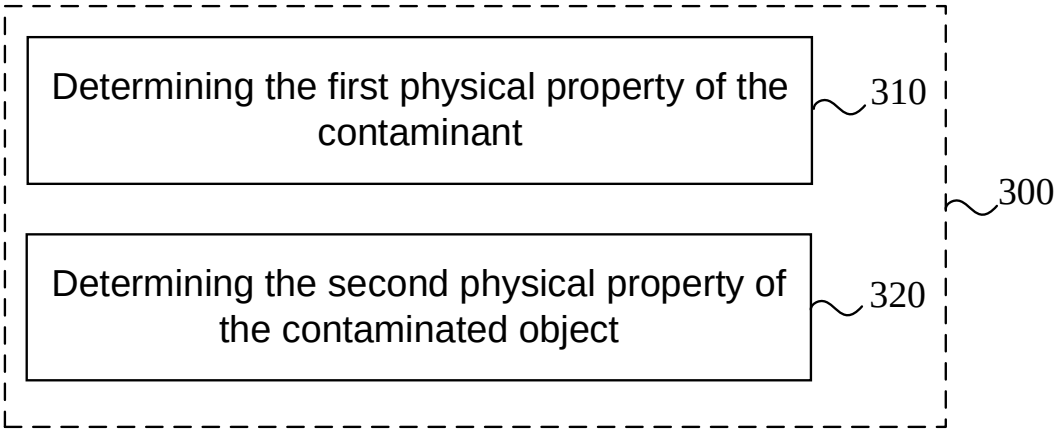

Determining the first physical property of the contaminant
310
Determining the second physical property of the contaminated object
320
300

FIG. 4

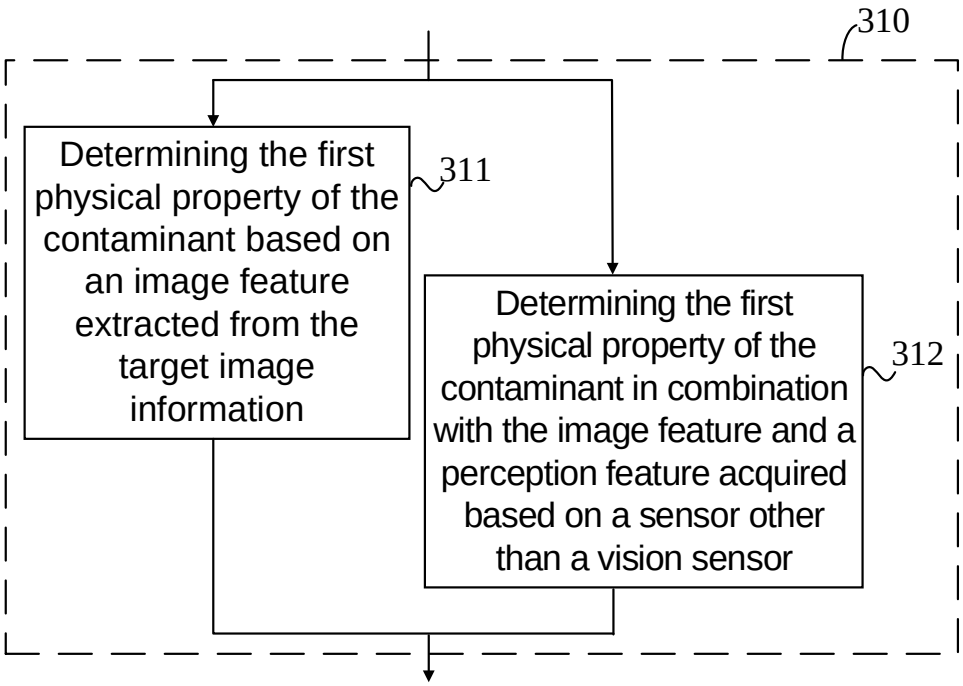

310
Determining the first physical property of the contaminant based on an image feature extracted from the target image information
311
Determining the first physical property of the contaminant in combination with the image feature and a perception feature acquired based on a sensor other than a vision sensor
312

FIG. 5

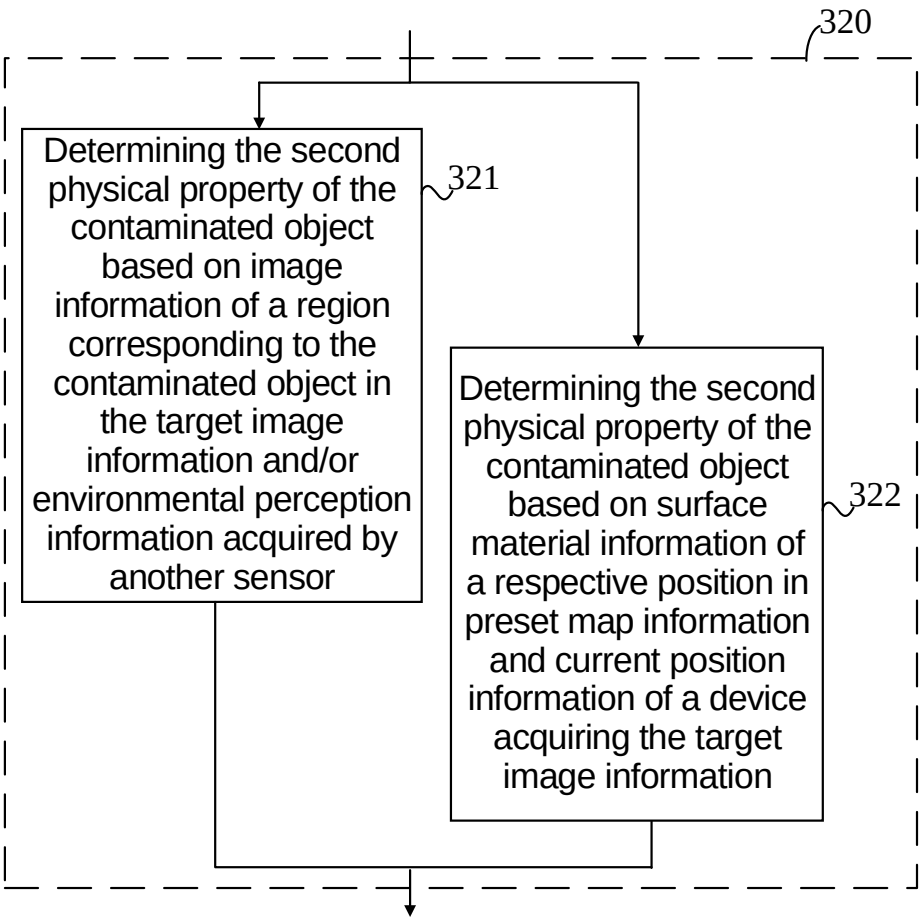

320
Determining the second physical property of the contaminated object based on image information of a region corresponding to the contaminated object in the target image information and/or environmental perception information acquired by another sensor
321
Determining the second physical property of the contaminated object based on surface material information of a respective position in preset map information and current position information of a device acquiring the target image information
322

FIG. 6

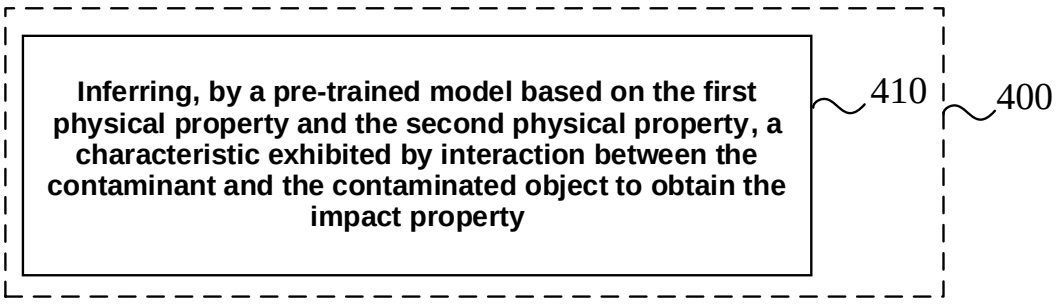

Inferring, by a pre-trained model based on the first physical property and the second physical property, a characteristic exhibited by interaction between the contaminant and the contaminated object to obtain the impact property
410
400

FIG. 7

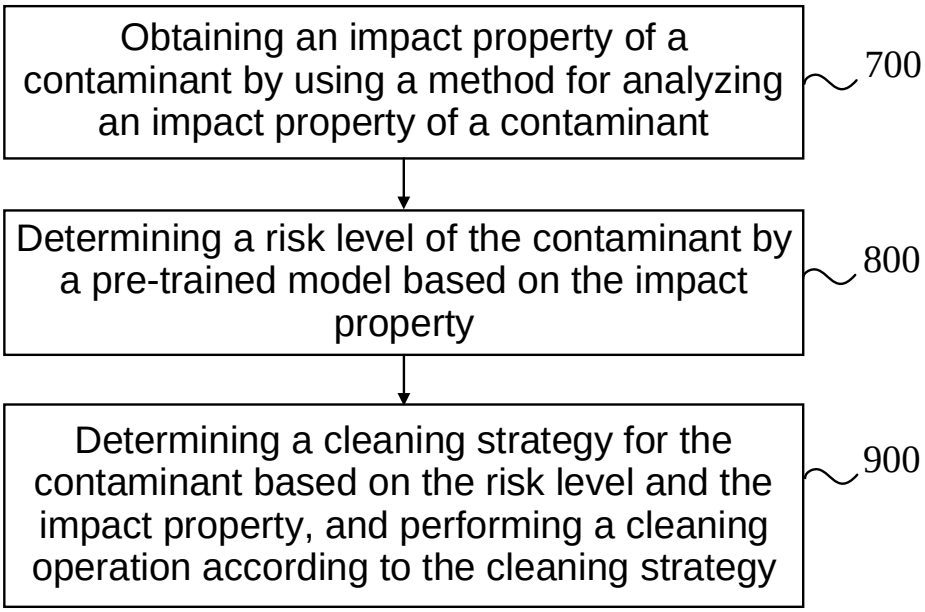

Obtaining an impact property of a contaminant by using a method for analyzing an impact property of a contaminant
700
Determining a risk level of the contaminant by a pre-trained model based on the impact property
800
Determining a cleaning strategy for the contaminant based on the risk level and the impact property, and performing a cleaning operation according to the cleaning strategy
900

FIG. 8

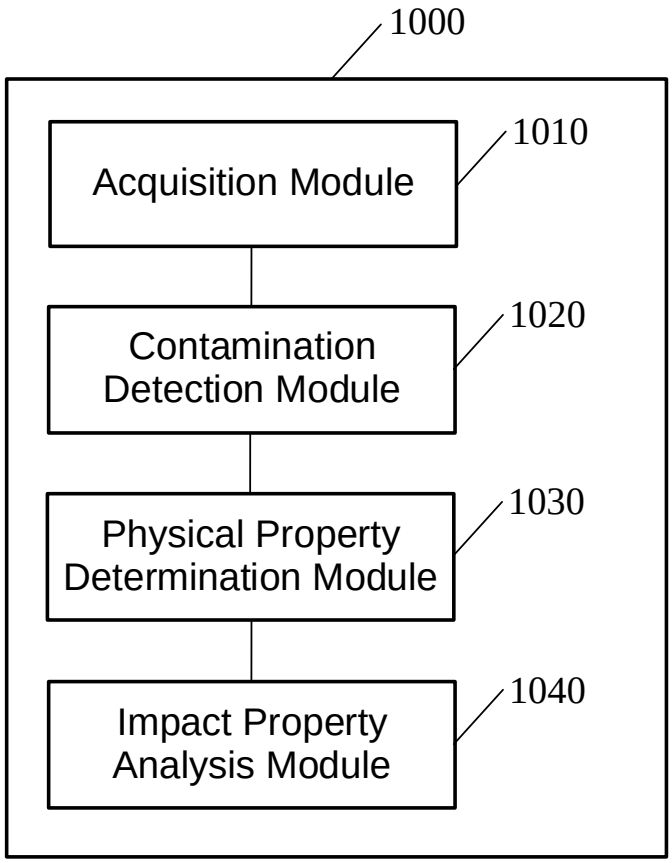

1000
Acquisition Module
1010
Contamination Detection Module
1020
Physical Property Determination Module
1030
Impact Property Analysis Module
1040

FIG. 9

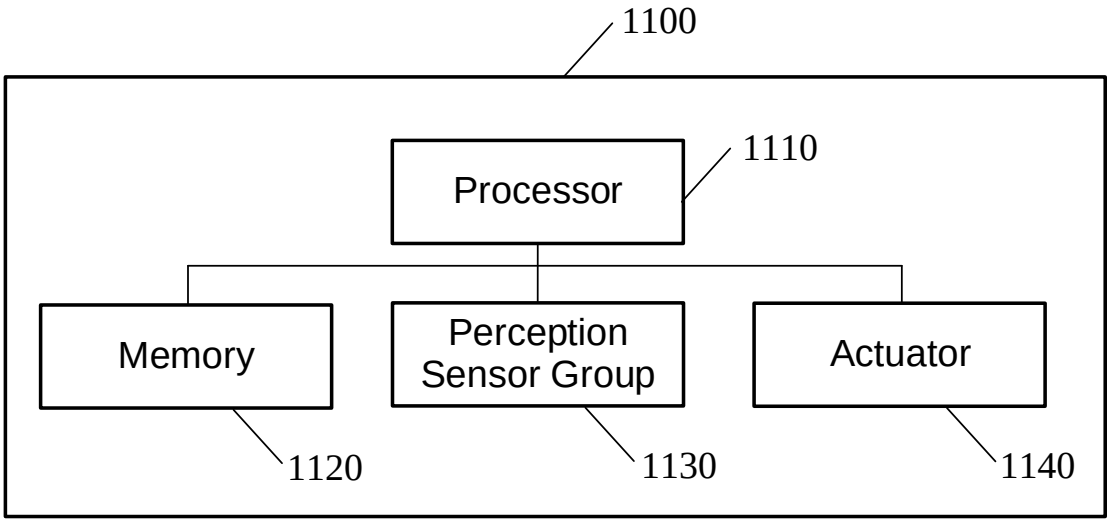

1100
Processor
1110
Memory
Perception
Sensor Group
Actuator
1120
1130
1140

FIG. 10