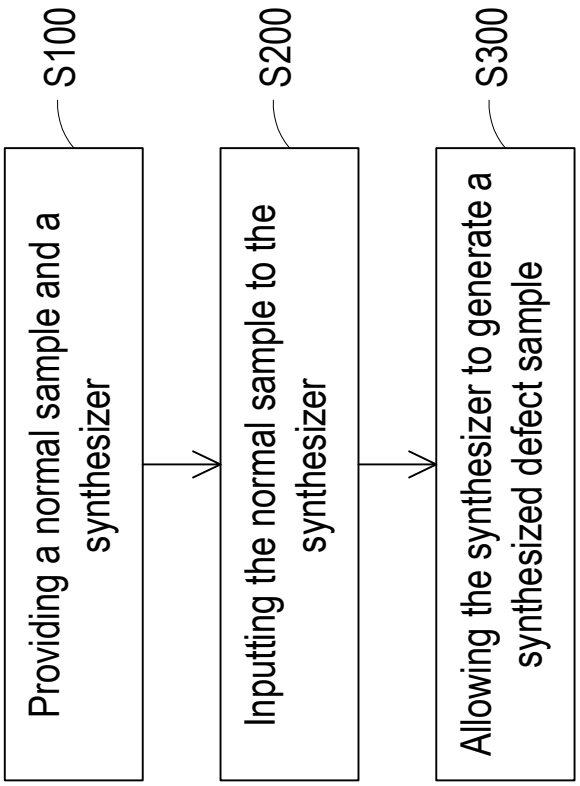

S100
Providing a normal sample and a synthesizer
S200
Inputting the normal sample to the synthesizer
S300
Allowing the synthesizer to generate a synthesized defect sample

FIG. 1

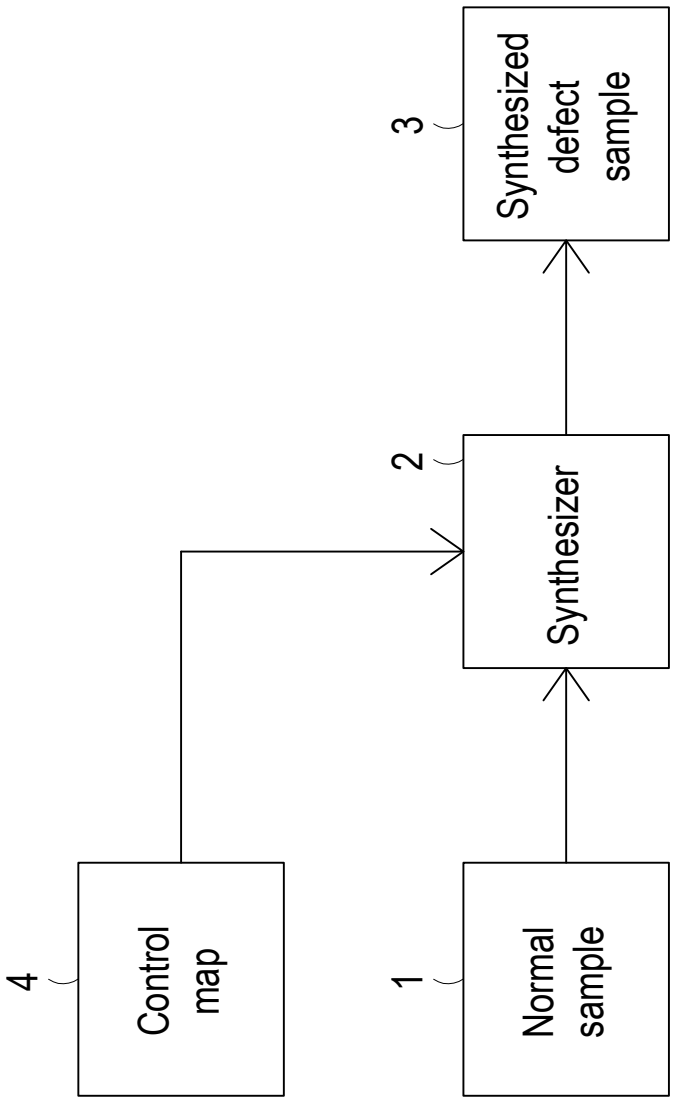

Synthesized defect sample
3
Synthesizer
2
Control map
4
Normal sample
1

FIG. 2

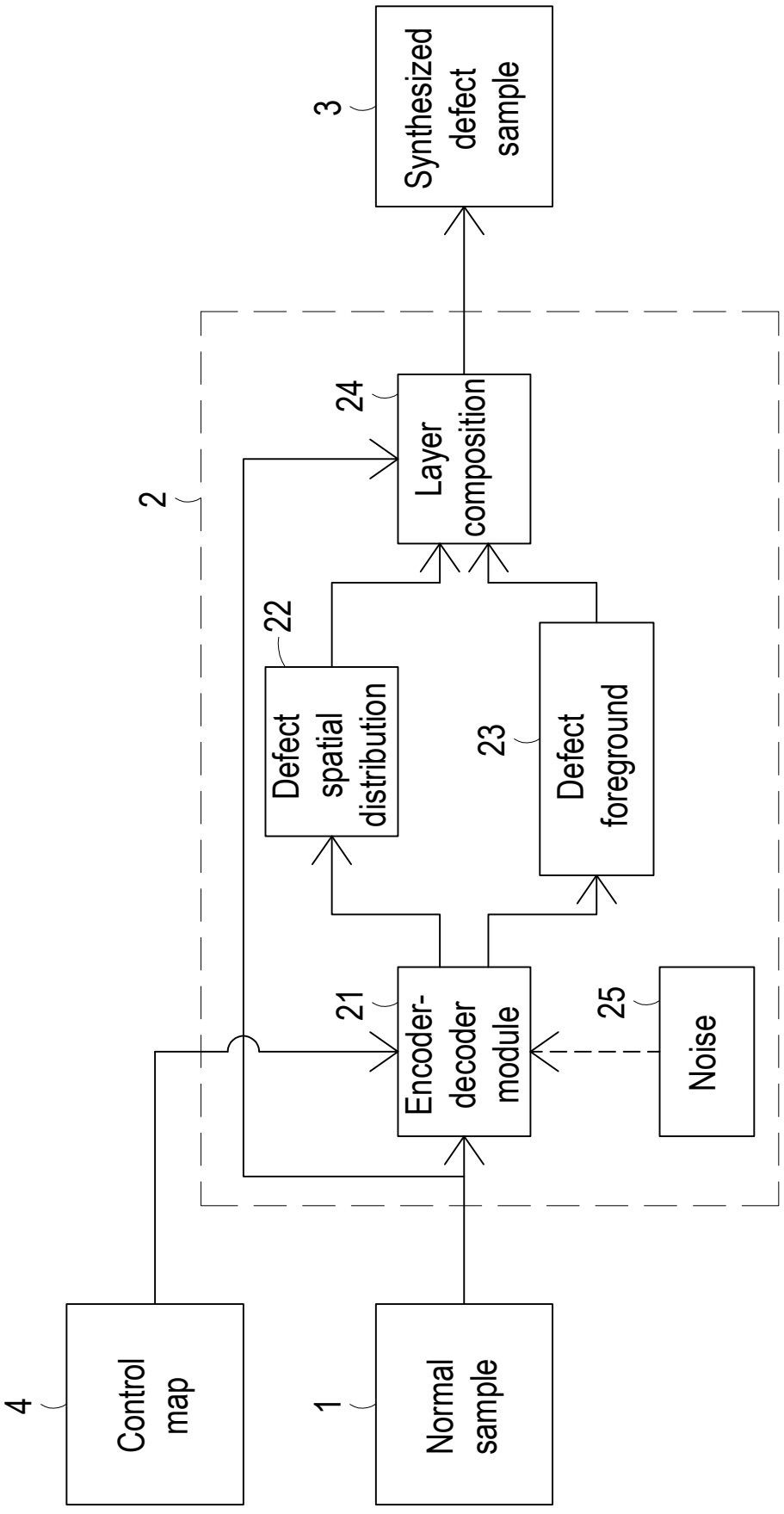

Synthesized defect sample
3
2
Layer composition
24
Defect spatial distribution
22
Defect foreground
23
Encoder-decoder module
21
Noise
25
Control map
4
Normal sample
1

FIG. 3

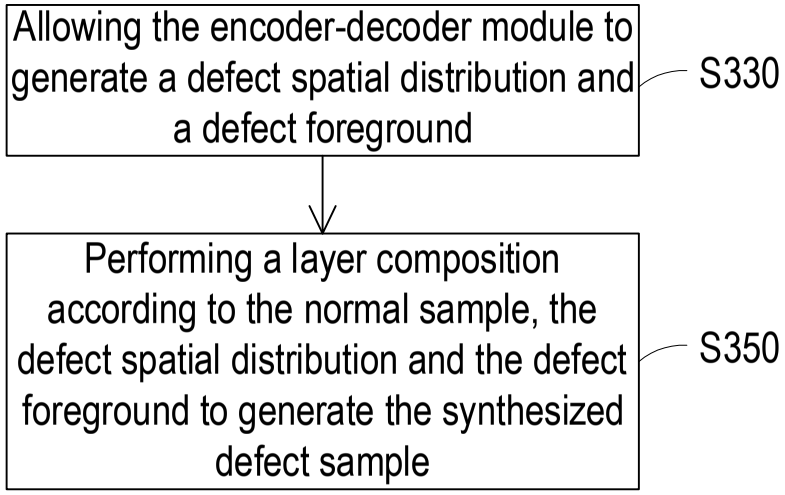

Allowing the encoder-decoder module to generate a defect spatial distribution and a defect foreground
S330
Performing a layer composition according to the normal sample, the defect spatial distribution and the defect foreground to generate the synthesized defect sample
S350

FIG. 4

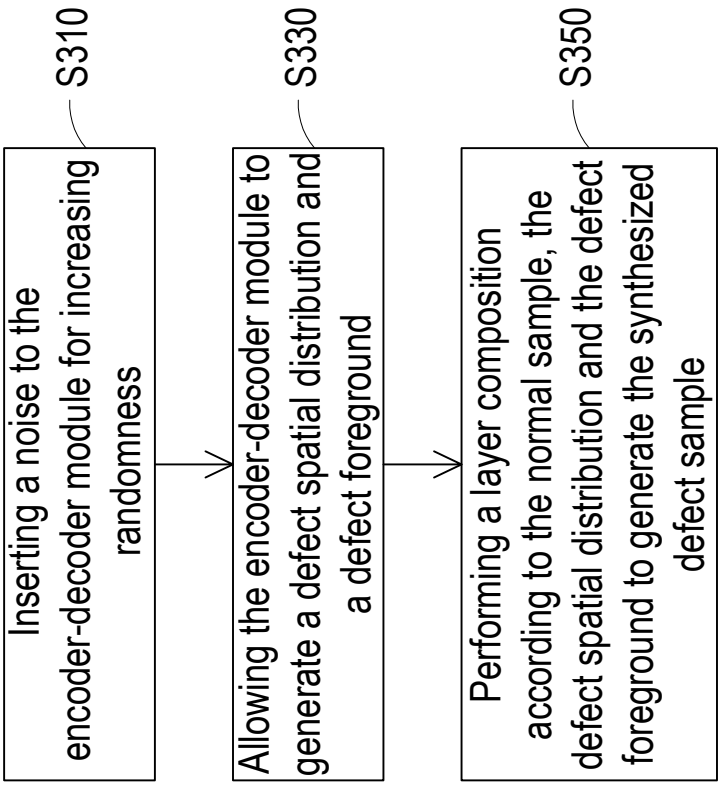

S310
Inserting a noise to the encoder-decoder module for increasing randomness
S330
Allowing the encoder-decoder module to generate a defect spatial distribution and a defect foreground
S350
Performing a layer composition according to the normal sample, the defect spatial distribution and the defect foreground to generate the synthesized defect sample

FIG. 5

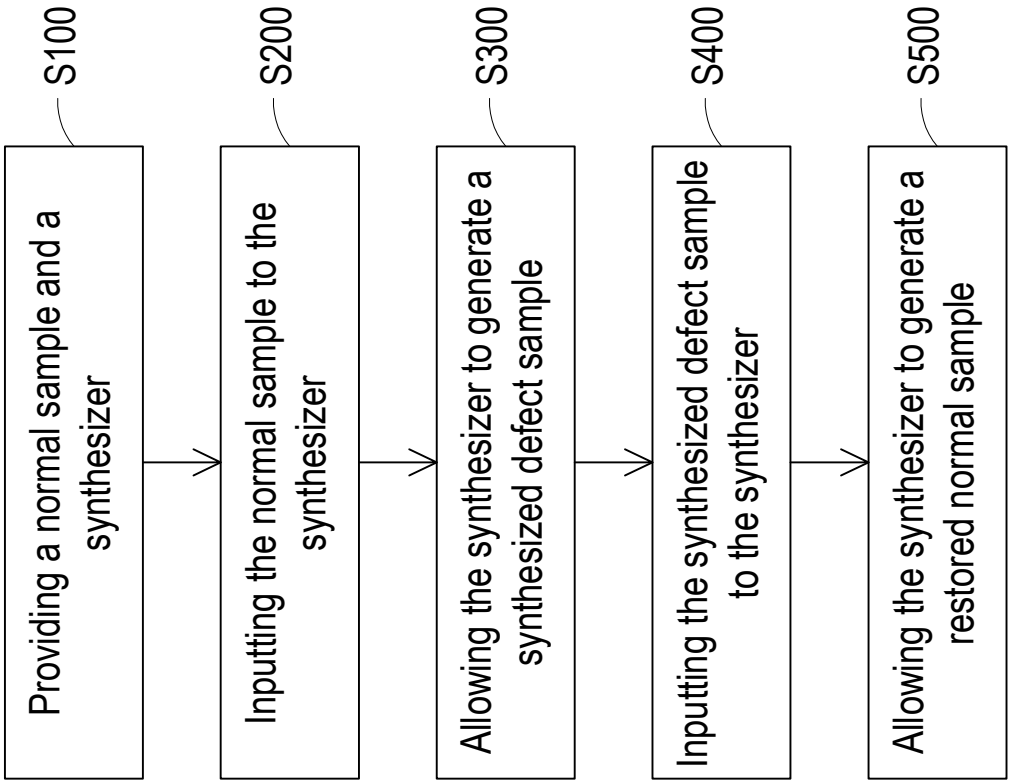

S100
Providing a normal sample and a synthesizer
S200
Inputting the normal sample to the synthesizer
S300
Allowing the synthesizer to generate a synthesized defect sample
S400
Inputting the synthesized defect sample to the synthesizer
S500
Allowing the synthesizer to generate a restored normal sample

FIG. 6

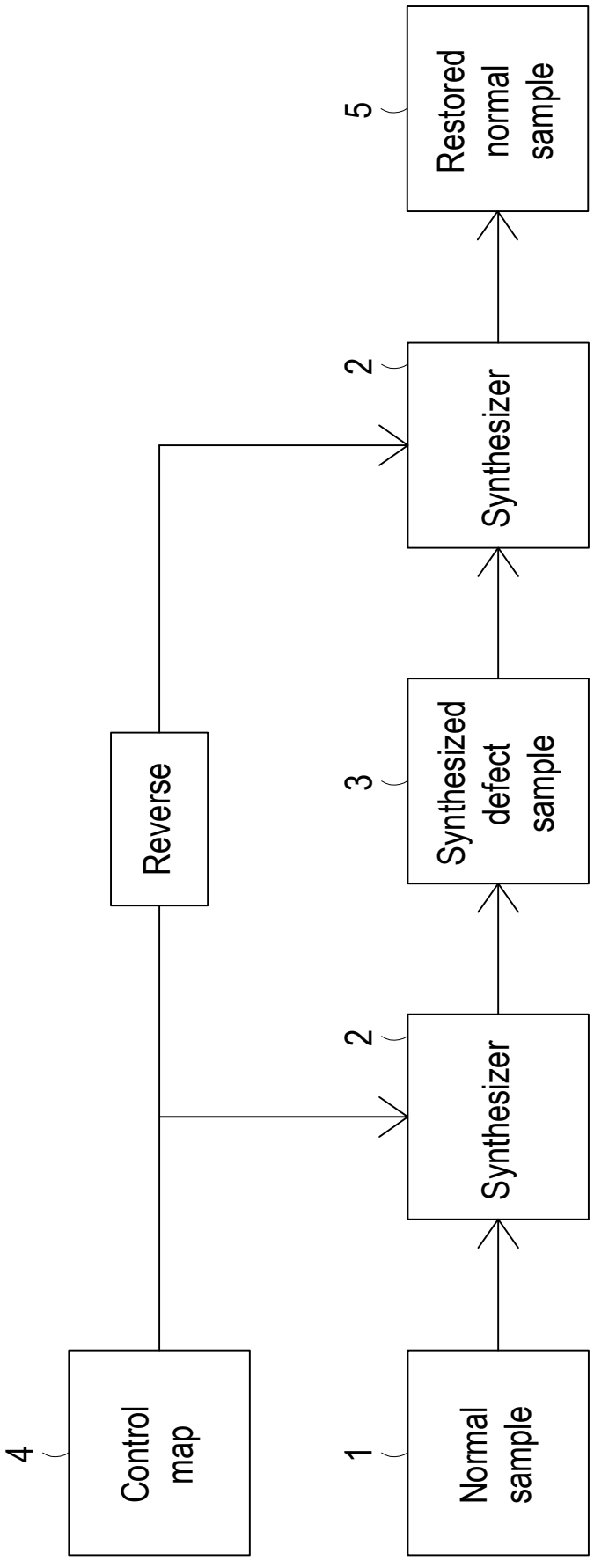

Restored normal sample
5
Synthesizer
2
Synthesized defect sample
3
Reverse
Synthesizer
2
Control map
4
Normal sample
1

FIG. 7

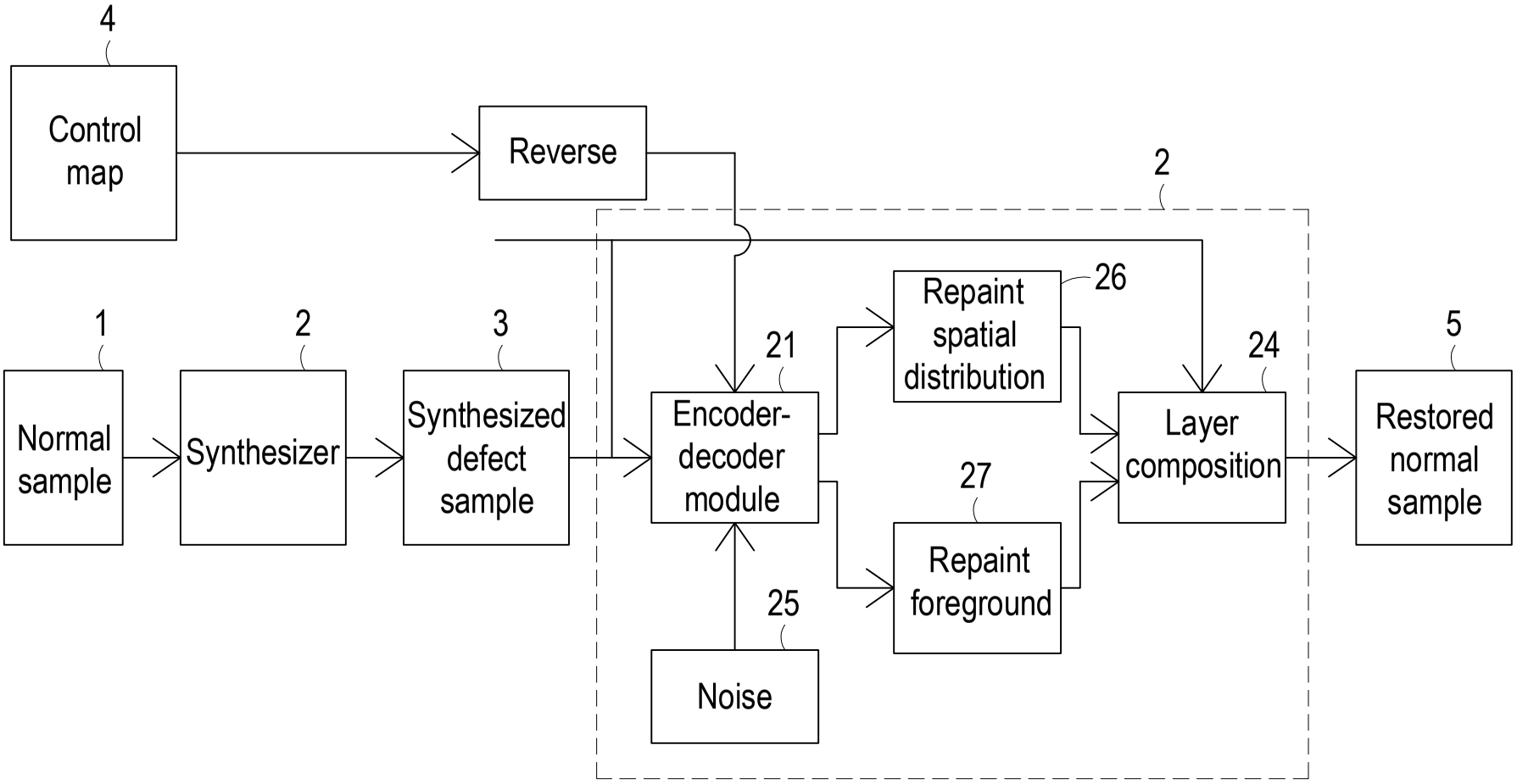

4
Control map
Reverse
2
1
Normal sample
2
Synthesizer
3
Synthesized defect sample
21
Encoder-decoder module
26
Repaint spatial distribution
27
Repaint foreground
25
Noise
24
Layer composition
5
Restored normal sample

FIG. 8

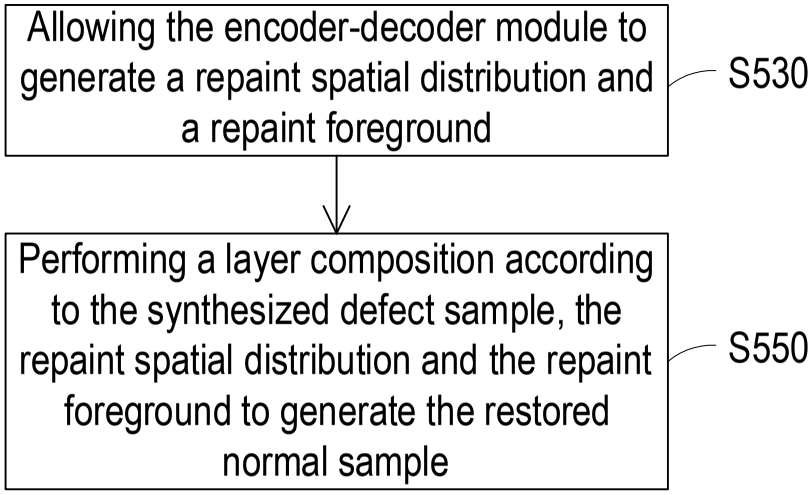

Allowing the encoder-decoder module to generate a repaint spatial distribution and a repaint foreground
S530
Performing a layer composition according to the synthesized defect sample, the repaint spatial distribution and the repaint foreground to generate the restored normal sample
S550

FIG. 9

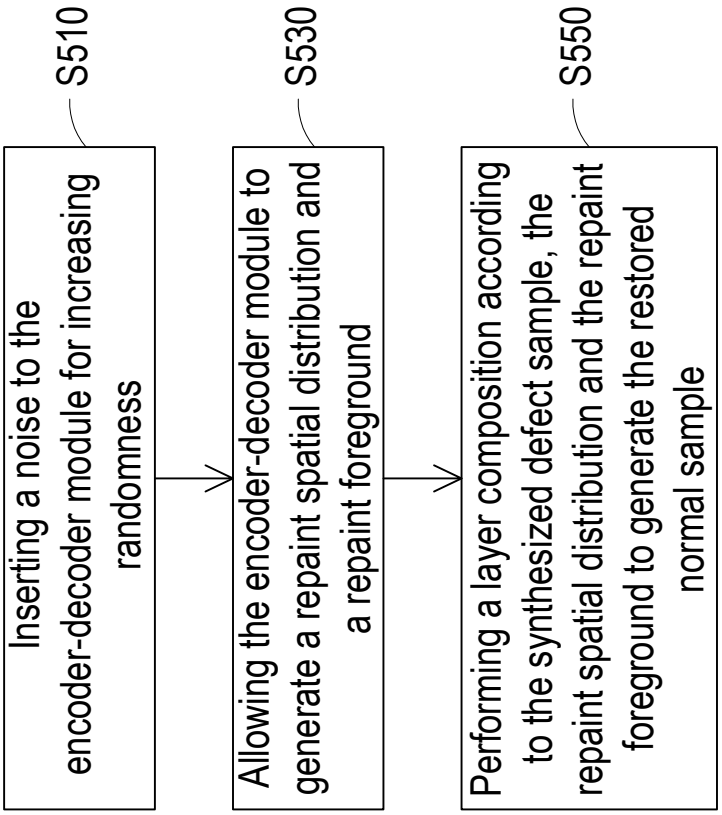

S510
Inserting a noise to the encoder-decoder module for increasing randomness
S530
Allowing the encoder-decoder module to generate a repaint spatial distribution and a repaint foreground
S550
Performing a layer composition according to the synthesized defect sample, the repaint spatial distribution and the repaint foreground to generate the restored normal sample

FIG. 10

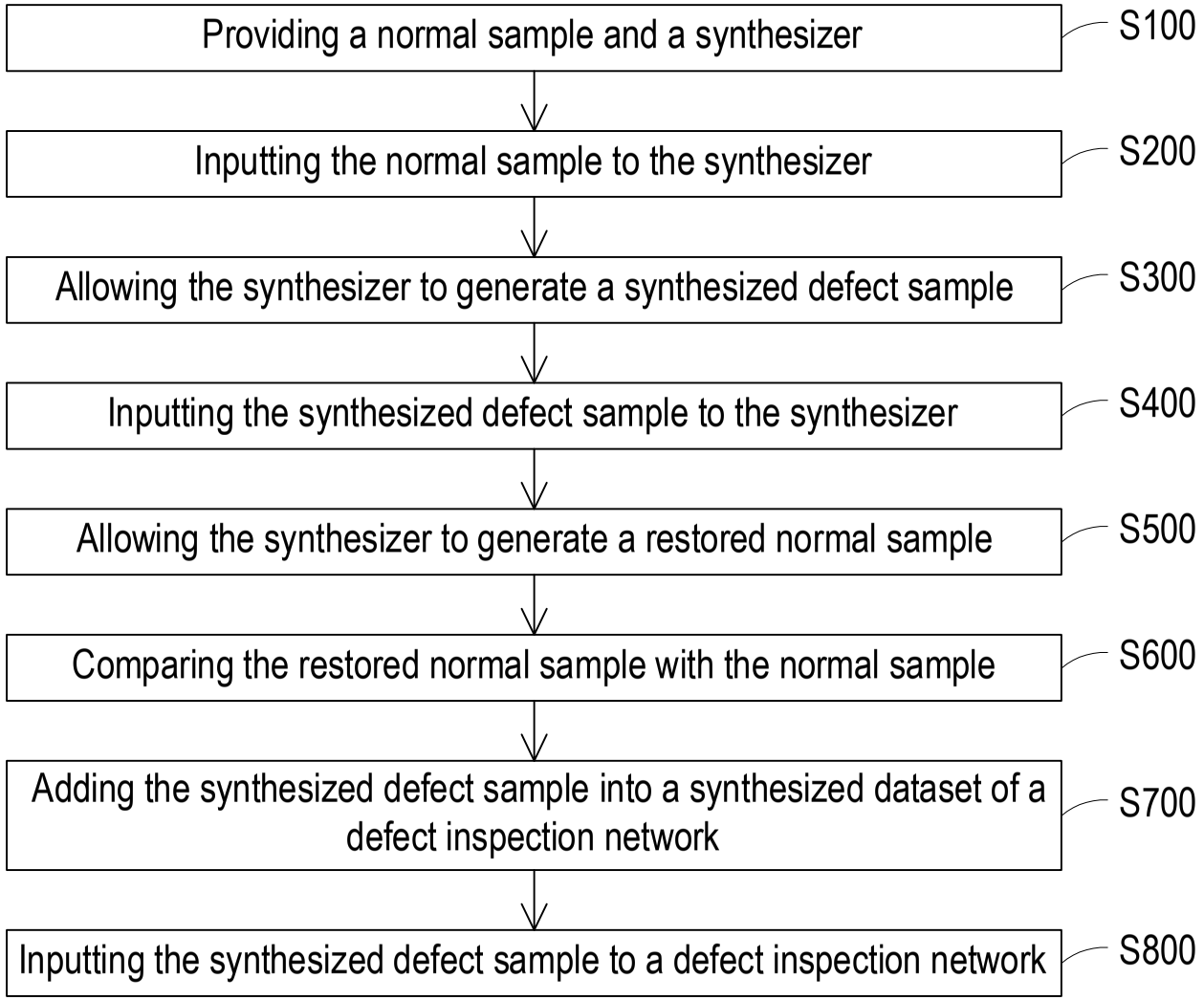

Providing a normal sample and a synthesizer
S100
Inputting the normal sample to the synthesizer
S200
Allowing the synthesizer to generate a synthesized defect sample
S300
Inputting the synthesized defect sample to the synthesizer
S400
Allowing the synthesizer to generate a restored normal sample
S500
Comparing the restored normal sample with the normal sample
S600
Adding the synthesized defect sample into a synthesized dataset of a defect inspection network
S700
Inputting the synthesized defect sample to a defect inspection network
S800

FIG. 11

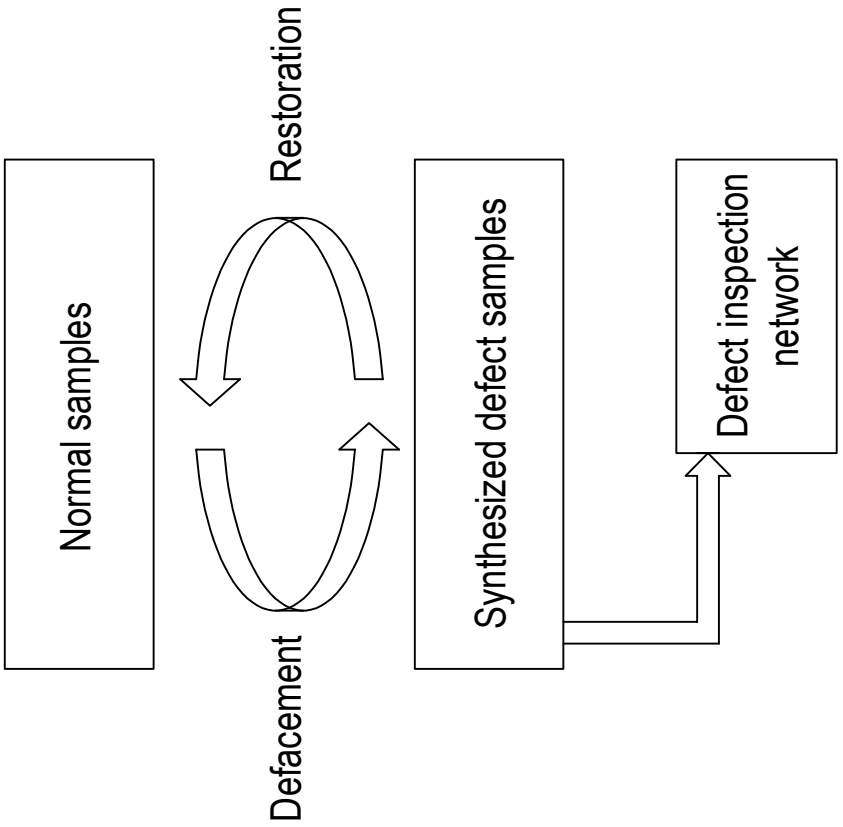

Normal samples
Restoration
Defacement
Synthesized defect samples
Defect inspection network

FIG. 12

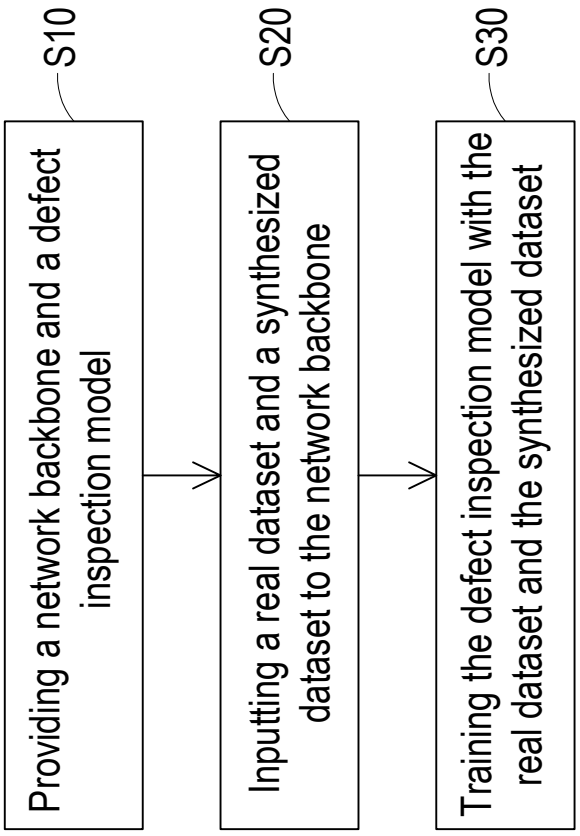

S10
Providing a network backbone and a defect inspection model
S20
Inputting a real dataset and a synthesized dataset to the network backbone
S30
Training the defect inspection model with the real dataset and the synthesized dataset

FIG. 13

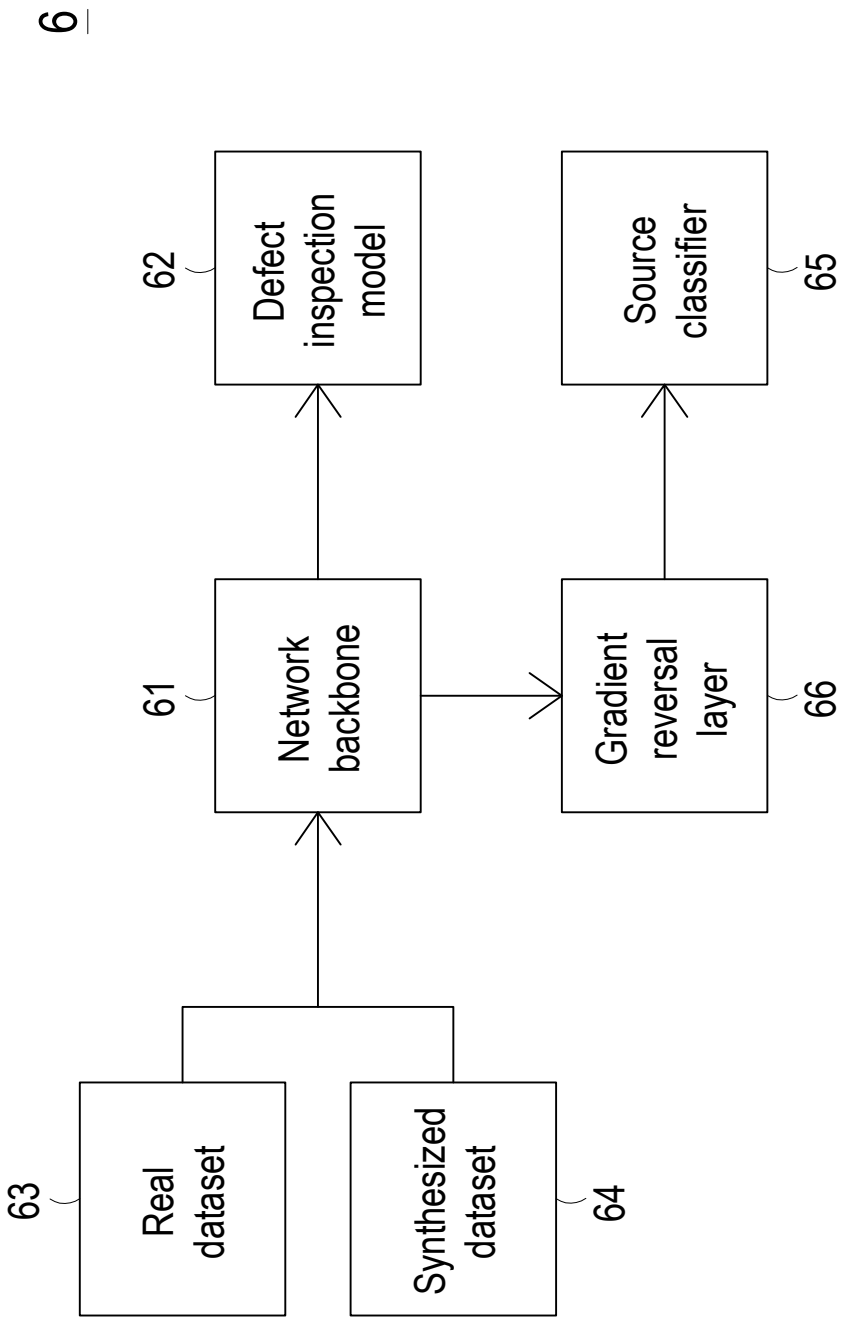

6
62
Defect inspection model
Source classifier
65
61
Network backbone
Gradient reversal layer
66
63
Real dataset
Synthesized dataset
64

FIG. 14

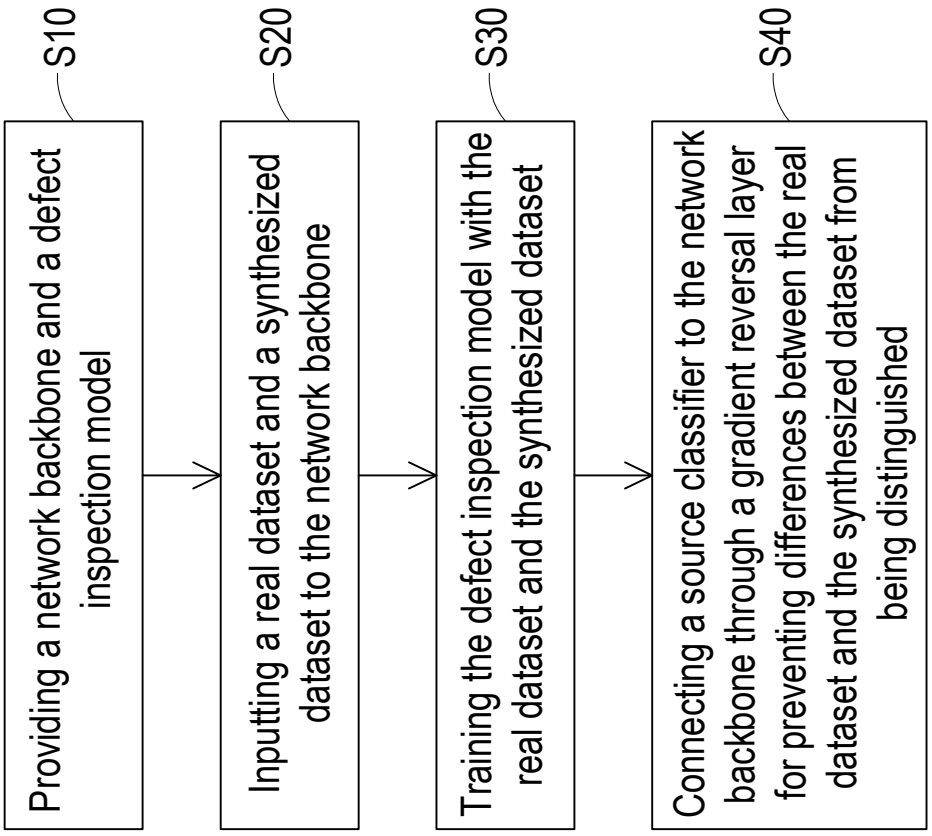

S10
Providing a network backbone and a defect inspection model
S20
Inputting a real dataset and a synthesized dataset to the network backbone
S30
Training the defect inspection model with the real dataset and the synthesized dataset
S40
Connecting a source classifier to the network backbone through a gradient reversal layer for preventing differences between the real dataset and the synthesized dataset from being distinguished

FIG. 15