CLAIMS

1. A method for identifying target objects, comprising:

clipping out a target image from an acquired image, wherein a plurality of target objects to be identified are stacked and involved in the target image;

adjusting a height of the target image to a preset height by scaling, wherein a height direction of the target image corresponds to a direction in which the plurality of target objects to be identified are stacked;

extracting a feature map of the adjusted target image;

segmenting the feature map in a dimension corresponding to the height direction of the target image to obtain a preset number of segment features, wherein each segment feature corresponds to one target object; and

identifying the target objects based on each of the preset number of segment features;

wherein adjusting the height of the target image to the preset height by scaling comprises:

scaling the height and a width of the target image in equal proportions until a width of the scaled target image reaches a preset width;

in a case that the width of the scaled target image reaches the preset width while a height of the scaled target image is greater than the preset height, reducing the height and width of the scaled target image by equal proportions to obtain an adjusted target image until a height of the adjusted target image is equal to the preset height; and

in a case that the width of the scaled target image reaches the preset width while a height of the scaled target image is less than the preset height, filling the scaled

target image with first pixels to obtain an adjusted target image, so that a height of the adjusted target image is equal to the preset height;

wherein the preset number is equal to a maximum number of target objects to be identified; the preset width is set according to an average width of the target objects, and the preset height is set according to an average height of the target objects and the maximum number of the target objects to be identified.

2. The method according to claim 1, wherein each of the target objects to be identified in the target image is sheetlike and has an equal thickness, and the plurality of target objects to be identified are stacked in a direction of the thickness; and

the preset height is an integer multiple of the thickness.

3. The method according to claim 1 or 2, wherein both the extracting of the feature map and the identifying of the target objects are performed by a neural network which is trained using a sample image and labeled information thereof.

4. The method according to claim 3, wherein the labeled information of the sample image comprises a labeled category of each target object in the sample image; and

the neural network is trained by:

extracting features from a resized sample image to obtain a feature map of the resized sample image;

identifying target objects in the sample image based on each segment feature that is obtained by segmenting the feature map, to obtain a predicted category of each of the target objects in the sample image; and

adjusting parameter values of the neural network based on the predicted category of each target object in the sample image and the labeled category of each target object in the sample image.

5. The method according to claim 4, wherein the labeled information of the sample image further comprises a number of target objects of each labeled category; and

the adjusting of the parameter values of the neural network comprises:

adjusting the parameter values of the neural network based on the predicted category of each target object in the sample image, the labeled category of each target object in the sample image, the number of target objects of each labeled category in the sample image, and a number of target objects of each predicted category in the sample image.

6. The method according to claim 4, wherein the labeled information of the sample image further comprises a total number of target objects in the sample image; and

the adjusting of the parameter values of the neural network comprises:

adjusting the parameter values of the neural network based on the predicted category of each target object in the sample image, the labeled category of each target object in the sample image, a sum of numbers of target objects of respective predicted categories in the sample image, and the total number of target objects in the sample image.

7. The method according to claim 3, further comprising:

testing the trained neural network;

ranking accuracy of identification of each category of target objects by the neural network based on a result of the testing, to obtain an identification accuracy rank result;

ranking an error rate of identification of each category of target objects by the neural network based on the result of the testing, to obtain an identification error rate rank result; and

further training the neural network based on the identification accuracy rank result and the identification error rate rank result.

8. An apparatus for identifying target objects, comprising:

an obtaining unit, configured to clip out a target image from an acquired image, wherein a plurality of target objects to be identified that are stacked and involved in the target image;

an adjusting unit, configured to adjust a height of the target image to a preset height by scaling, wherein a height direction of the target image corresponds to a direction in which the plurality of target objects to be identified are stacked;

an extracting unit, configured to extract a feature map of the adjusted target image;

a segmenting unit, configured to segment the feature map in a dimension corresponding to the height direction of the target image to obtain a preset number of segment features, wherein the preset number of segment features and the target objects have a one-to-one correspondence; and

an identifying unit, configured to identify the target objects based on each of the preset number of segment features;

wherein when adjusting the height of the target image to the preset height by scaling, the adjusting unit is configured to:

scale the height and a width of the target image in equal proportions until a width of the scaled target image reaches a preset width;

in a case that the width of the scaled target image reaches the preset width while a height of the scaled target image is greater than the preset height, reduce the height and width of the scaled target image by equal proportions to obtain an adjusted target image until a height of the adjusted target image is equal to the preset height; and

in a case that the width of the scaled target image reaches the preset width, while a height of the scaled target image is less than the preset height, fill the scaled target image with first pixels to obtain an adjusted target image, so that a height of the adjusted target image is equal to the preset height;

wherein the preset number is equal to a maximum number of target objects to be identified; the preset width is set according to an average width of the target objects, and the preset height is set according to an average height of the target objects and the maximum number of the target objects to be identified.

9. The apparatus according to claim 8, wherein each of the target objects to be identified in the target image is sheetlike and has an equal thicknesses, and the plurality of target objects to be identified are stacked in a direction of the thickness; and the preset height is an integer multiple of the thickness.

10. The apparatus according to claim 8 or 9, wherein both the extracting of the feature map and the identifying of the target objects are performed by a neural network which is trained using a sample image and labeled information thereof.

11. The apparatus according to claim 10, wherein the labeled information of the sample image comprises a labeled category of each target object in the sample image; and the apparatus further comprises a training unit configured to train the neural network by:

extracting feature from a resized sample image to obtain a feature map of the resized sample image;

identifying target objects in the sample image based on each segment feature that is obtained by segmenting the feature map, to obtain a predicted category of each of the target objects in the sample image; and

adjusting parameter values of the neural network based on the predicted category of each target object in the sample image and the labeled category of each target object in the sample image.

12. The apparatus according to claim 11, wherein the labeled information of the sample image further comprises a number of target objects of each labeled category; and

the training unit is specifically configured to:

adjust the parameter values of the neural network based on the predicted category of each target object in the sample image, the labeled category of each target object in the sample image, the number of target objects of each labeled category in

the sample image, and a number of target objects of each predicted category in the sample image.

13. The apparatus according to claim 11, wherein the labeled information of the sample image further comprises a total number of target objects in the sample image; and

the training unit is specifically configured to:

adjust the parameter values of the neural network based on the predicted category of each target object in the sample image, the labeled category of each target object in the sample image, a sum of numbers of target objects of respective predicted category in the sample image, and the total number of target objects in the sample image.

14. The apparatus according to claim 10, further comprising a testing unit, configured to:

test the trained neural network;

rank, accuracy of identification of each category of target objects by the neural network based on a result of the testing, to obtain an identification accuracy rank result;

rank, an error rate of identification of each category of target objects by the neural network based on the result of the testing, to obtain an identification error rate rank result; and

further training the neural network based on the identification accuracy rank result and the identification error rate rank result.

15. An electronic device, comprising:

a processor; and

a memory storing instructions executable by the processor;

wherein the processor is configured to execute the instructions to implement the method according to any one of claims 1 to 7.

16. A computer-readable storage medium having computer program instructions stored thereon, wherein the computer program instructions, when executed by a processor, cause the processor to implement the method according to any one of claims 1 to 7.