CLAIMS

1. An item identification method, comprising:

determining categories of items contained in a group of to-be-identified items and quantity information of items in each category contained in the group of to-be-identified items by performing short-range wireless communication with each item in the group of to-be-identified items in a scenario region, each item containing a short-range wireless communication tag corresponding to a category of each item;

identifying acquired images of the group of to-be-identified items to obtain an image identification result of the group of to-be-identified items, the image identification result comprising a category identification result of each item in the group of to-be-identified items; and

determining an item identification result of the group of to-be-identified items based on the quantity information and the image identification result, comprising:

determining a to-be-matched image identification result and a matched image identification result from the image identification result of the group of to-be-identified items based on the image identification result and a preset confidence threshold;

determining quantity information of matched items of the items in each category according to the matched image identification result;

determining quantity information of to-be-matched items in each category based on the quantity information of the matched items and the quantity information of the items in each category;

performing matching check according to the quantity information of the to-be-matched items in each category and the to-be-matched image identification result, to determine a secondary identification result; and

determining the item identification result according to the matched image identification result and the secondary identification result.

2. The method of claim 1, wherein the determining categories of items contained in a group of to-be-identified items and quantity information of items in each category contained in the group of to-be-identified items by performing short-range wireless communication with each item in the group of to-be-identified items in a scenario region comprises:

performing, with a first communication component pre-erected in the scenario region, short-range wireless communication with a second communication component of each to-be-identified item in the group of to-be-identified items in the scenario region to obtain an item identifier stored in the second communication component of each item; and

determining, based on the item identifier and a prestored preset correspondence between item identifiers and item categories, the categories of the items contained in the group of to-be-identified and the quantity information of the items in each category contained in the group of to-be-identified items.

3. The method of claim 1, wherein the category identification result of each item comprises a probability of each item belonging to each of k categories, k being an integer greater than or equal to 1;

wherein the matched image identification result comprises the category identification result of matched items in the group of to-be-identified items, the matched items comprising an item with a maximum probability, among the k probabilities, greater than the preset confidence threshold;

wherein the to-be-matched image identification result comprises the category identification result of to-be-matched items in the group of to-be-identified items, the to-be-matched items comprising an item with a maximum probability, among the k probabilities, less than the preset confidence threshold.

4. The method of claim 3, wherein the performing matching check according to the quantity information of the to-be-matched items in each category and the to-be-matched image identification result, to determine a secondary identification result comprises:

constructing an item element set of each category, total quantity information of item elements in the item element set referring to quantity information of the to-be-matched items in a corresponding category;

determining a candidate category of each to-be-matched item according to the probability of each item belonging to each of k categories;

constructing a weighted bipartite graph for each to-be-matched item, wherein the to-be-matched item is taken as a first node and each item element in the item element set of each candidate category is taken as a second node in the weighted bipartite graph, a probability of the candidate category corresponding to each second node is a weight corresponding to an edge connecting the first node to each second node, and the candidate category corresponding to each second node is a category corresponding to an item element set to which the item element represented by each second node belongs; and

performing maximum bipartite graph matching based on the weighted bipartite graph, to obtain a category of each to-be-matched item as the secondary identification result.

5. The method of claim 4, wherein the performing matching check according to the quantity information of the to-be-matched items in each category and the to-be-matched image identification result, to determine a secondary identification result further comprises:

for each to-be-matched item, in a case where a result of the maximum bipartite graph matching performed based on the weighted bipartite graph is that none of the to-be-matched items is successfully matched with each of the item elements, taking the candidate category with a maximum probability of the to-be-matched item as the secondary identification result of the to-be-matched item.

6. The method of claim 3, wherein the determining the item identification result according to the matched image identification result and the secondary identification result comprises:

fusing the category identification result of the matched items in the matched image identification result with the secondary identification result of the to-be-matched items to obtain the item identification result.

7. An item identification apparatus, comprising:

a communication unit, configured to determine categories of items contained in a group of to-be-identified items and quantity information of items in each category contained in the group of to-be-identified items by performing short-range wireless communication with each item in the group of to-be-identified items in a scenario region, each item containing a short-range wireless communication tag corresponding to a category of each item;

an identification unit, configured to identify acquired images of the group of to-be-identified items to obtain an image identification result of the group of to-be-identified items, the image identification result comprising a category identification result of each item in the group of to-be-identified items; and

a determination unit, configured to determine an item identification result of the group of to-be-identified items based on the quantity information and the image identification result;

wherein the determination unit is further configured to:

determine a to-be-matched image identification result and a matched image identification result from the image identification result of the group of to-be-identified items based on the image identification result and a preset confidence threshold;

determine quantity information of matched items of the items in each category according to the matched image identification result;

determine quantity information of to-be-matched items in each category based on the

quantity information of the matched items and the quantity information of the items in each category;

perform matching check according to the quantity information of the to-be-matched items in each category and the to-be-matched image identification result, to determine a secondary identification result; and

determine the item identification result according to the matched image identification result and the secondary identification result.

8. An electronic device, comprising a memory and a processor,

wherein the memory is configured to store an executable computer program;

wherein when executing the executable computer program stored in the memory, the processor is configured to:

determine categories of items contained in a group of to-be-identified items and quantity information of items in each category contained in the group of to-be-identified items by performing short-range wireless communication with each item in the group of to-be-identified items in a scenario region, each item containing a short-range wireless communication tag corresponding to a category of each item;

identify acquired images of the group of to-be-identified items to obtain an image identification result of the group of to-be-identified items, the image identification result comprising a category identification result of each item in the group of to-be-identified items; and

determine an item identification result of the group of to-be-identified items based on the quantity information and the image identification result;

wherein the processor is further configured to:

determine a to-be-matched image identification result and a matched image identification result from the image identification result of the group of to-be-identified items based on the

image identification result and a preset confidence threshold;

determine quantity information of matched items of the items in each category according to the matched image identification result;

determine quantity information of to-be-matched items in each category based on the quantity information of the matched items and the quantity information of the items in each category;

perform matching check according to the quantity information of the to-be-matched items in each category and the to-be-matched image identification result, to determine a secondary identification result; and

determine the item identification result according to the matched image identification result and the secondary identification result.

9. The electronic device of claim 8, wherein when determining the categories of the items contained in the group of to-be-identified items and the quantity information of the items in each category contained in the group of to-be-identified items by performing short-range wireless communication with each item in the group of to-be-identified items in the scenario region, the processor is configured to:

perform, with a first communication component pre-erected in the scenario region, short-range wireless communication with a second communication component of each to-be-identified item in the group of to-be-identified items in the scenario region to obtain an item identifier stored in the second communication component of each item; and

determine, based on the item identifier and a prestored preset correspondence between item identifiers and item categories, the categories of the items contained in the group of to-be-identified and the quantity information of the items in each category contained in the group of to-be-identified items.

10. The electronic device of claim 8, wherein the category identification result of each item comprises a probability of each item belonging to each of k categories, k being an integer greater than or equal to 1;

wherein the matched image identification result comprises the category identification result of matched items in the group of to-be-identified items, the matched items comprising an item with a maximum probability, among the k probabilities, greater than the preset confidence threshold;

wherein the to-be-matched image identification result comprises the category identification result of to-be-matched items in the group of to-be-identified items, the to-be-matched items comprising an item with a maximum probability, among the k probabilities, less than the preset confidence threshold.

11. The electronic device of claim 10, wherein when performing the matching check according to the quantity information of the to-be-matched items in each category and the to-be-matched image identification result, to determine a secondary identification result, the processor is configured to:

construct an item element set of each category, total quantity information of item elements in the item element set referring to quantity information of the to-be-matched items in a corresponding category;

determine a candidate category of each to-be-matched item according to the probability of each item belonging to each of k categories;

construct a weighted bipartite graph for each to-be-matched item, wherein the to-be-matched item is taken as a first node and each item element in the item element set of each candidate category is taken as a second node in the weighted bipartite graph, a probability of the candidate category corresponding to each second node is a weight corresponding to an edge connecting the first node to each second node, and the candidate category corresponding to each second node is a category corresponding to an item element set to which the item element represented by each second node belongs; and

perform maximum bipartite graph matching based on the weighted bipartite graph, to obtain a category of each to-be-matched item as the secondary identification result.

12. The electronic device of claim 11, wherein when performing the matching check according to the quantity information of the to-be-matched items in each category and the to-be-matched image identification result, to determine a secondary identification result, the processor is further configured to:

for each to-be-matched item, in a case where a result of the maximum bipartite graph matching performed based on the weighted bipartite graph is that none of the to-be-matched items is successfully matched with each of the item elements, take the candidate category with a maximum probability of the to-be-matched item as the secondary identification result of the to-be-matched item.

13. The electronic device of claim 10, wherein when determining the item identification result according to the matched image identification result and the secondary identification result, the processor is configured to:

fuse the category identification result of the matched items in the matched image identification result with the secondary identification result of the to-be-matched items to obtain the item identification result.

14. A computer-readable storage medium, having a computer program stored thereon, wherein the computer program, when executed by a processor, is configured to:

determine categories of items contained in a group of to-be-identified items and quantity information of items in each category contained in the group of to-be-identified items by performing short-range wireless communication with each item in the group of to-be-identified items in a scenario region, each item containing a short-range wireless communication tag corresponding to a category of each item;

identify acquired images of the group of to-be-identified items to obtain an image identification result of the group of to-be-identified items, the image identification result comprising a category identification result of each item in the group of to-be-identified items; and

determine an item identification result of the group of to-be-identified items based on the quantity information and the image identification result;

wherein the computer program is further configured to:

determine a to-be-matched image identification result and a matched image identification result from the image identification result of the group of to-be-identified items based on the image identification result and a preset confidence threshold;

determine quantity information of matched items of the items in each category according to the matched image identification result;

determine quantity information of to-be-matched items in each category based on the quantity information of the matched items and the quantity information of the items in each category;

perform matching check according to the quantity information of the to-be-matched items in each category and the to-be-matched image identification result, to determine a secondary identification result; and

determine the item identification result according to the matched image identification result and the secondary identification result.

15. The computer-readable storage medium of claim 14, wherein when determining the categories of the items contained in the group of to-be-identified items and the quantity information of the items in each category contained in the group of to-be-identified items by performing short-range wireless communication with each item in the group of to-be-identified items in the scenario region, the computer program is configured to:

perform, with a first communication component pre-erected in the scenario region, short-

range wireless communication with a second communication component of each to-be-identified item in the group of to-be-identified items in the scenario region to obtain an item identifier stored in the second communication component of each item; and

determine, based on the item identifier and a prestored preset correspondence between item identifiers and item categories, the categories of the items contained in the group of to-be-identified and the quantity information of the items in each category contained in the group of to-be-identified items.

16. The computer-readable storage medium of claim 14, wherein the category identification result of each item comprises a probability of each item belonging to each of k categories, k being an integer greater than or equal to 1;

wherein the matched image identification result comprises the category identification result of matched items in the group of to-be-identified items, the matched items comprising an item with a maximum probability, among the k probabilities, greater than the preset confidence threshold;

wherein the to-be-matched image identification result comprises the category identification result of to-be-matched items in the group of to-be-identified items, the to-be-matched items comprising an item with a maximum probability, among the k probabilities, less than the preset confidence threshold.

17. A computer program, comprising computer instructions executable by an electronic device, wherein when executed by a processor in the electronic device, the computer instructions are configured to:

determine categories of items contained in a group of to-be-identified items and quantity information of items in each category contained in the group of to-be-identified items by performing short-range wireless communication with each item in the group of to-be-identified items in a scenario region, each item containing a short-range wireless

communication tag corresponding to a category of each item;

identify acquired images of the group of to-be-identified items to obtain an image identification result of the group of to-be-identified items, the image identification result comprising a category identification result of each item in the group of to-be-identified items; and

determine an item identification result of the group of to-be-identified items based on the quantity information and the image identification result;

wherein the computer instructions are further configured to:

determine a to-be-matched image identification result and a matched image identification result from the image identification result of the group of to-be-identified items based on the image identification result and a preset confidence threshold;

determine quantity information of matched items of the items in each category according to the matched image identification result;

determine quantity information of to-be-matched items in each category based on the quantity information of the matched items and the quantity information of the items in each category;

perform matching check according to the quantity information of the to-be-matched items in each category and the to-be-matched image identification result, to determine a secondary identification result; and

determine the item identification result according to the matched image identification result and the secondary identification result.