WHAT IS CLAIMED IS:

1. A commodity sensing system based on weight monitoring, comprising:

a shelf, which includes a plurality of racks, and each rack is placed with at least one kind of goods;

a goods database generation unit that generates a goods database;

a weight acquisition unit that collects a weight sensing value of a rack in real time;

a pick or place status judgment unit that determines whether the weight sensing value of the rack changes or not, wherein if the weight sensing value of the rack becomes smaller, the pick or place status judgment unit determines that there are one or more goods taken away from the rack; and if the weight sensing value of the rack becomes larger, the pick or place status judgment unit determines that there are one or more articles placed on the rack;

a goods database updating unit that stores the weight sensing value in the goods database to update the weight sensing value of the rack in the goods database in real time;

a user identification system, for identifying the identity information of each user, which is included in electronic payment information;

a target positioning system, for establishing a 3D coordinate system in the closed space in which the goods are located, and obtaining the group real-time coordinates of each user and his/her extension in the closed space, wherein the real-time coordinates include the groups of hand coordinates of each user; the target positioning system includes at least one image sensor distributed at the top of the closed space, the field of view of the lenses of the image sensors covers the entire bottom surface of the closed space;

a shopping user judgment system, for determining the identity of a user who takes out or puts back the goods, when there is an intersection between the group of coordinates of the rack space above a rack and the group of coordinates of a user's hand and the weight sensing value of the rack have changed at the same time;

a shopping information recording unit, for generating at least one shopping database according to the identity information of each user, so as to record the category and quantity of at least one item taken by each user; and

a settlement system, for settling a fee by electronic payment according to the shopping database of a user, when the image sensors cannot acquire the real-time 3D image of the user.

2. The commodity sensing system according to claim 1, wherein the goods database generation unit comprises:

an initialization unit that initializes the goods database;

an information input unit that records a weight value and goods information of each item of the goods, and stores the weight value and the goods information in the goods database; and

a value initialization unit that collects the weight sensing value of the rack after the goods are placed thereon, and stores the weight sensing value in the goods database.

3. The commodity sensing system according to claim 1, wherein the pick or place status judgment unit comprises:

a weight difference calculation unit that calculates a difference value between the weight sensing value of the rack collected in real time and the weight sensing value of the same rack stored in the goods database, and records the difference value as a weight difference value of the rack;

a weight difference judgment unit that compares the weight difference value of the rack with 0, wherein when the weight difference value of the rack is less than 0, it determines that there are goods taken away from the rack; and when the weight difference value of the rack is greater than 0, it determines that there are articles placed on the rack; and

a rack information recording unit that records a rack number of the rack and the weight difference of the rack when the weight difference of the rack is greater than 0 or less than 0.

4. The commodity sensing system according to claim 3, wherein

when all goods on a same rack have a same type and a same weight, the pick or place status judgment unit further comprises:

a goods type determining unit that determines a type of the goods taken away from the rack according to the rack number of the rack and goods information associated with the rack stored in the goods database; and

a goods quantity calculating unit that calculates a ratio of an absolute value of the weight difference of the rack to a weight value of a single item of the goods on the rack, wherein the ratio is rounded, by using a rounding method, to an integer which is a quantity of the taken goods.

5. The commodity sensing system according to claim 4, wherein the shopping information recording unit comprises:

a shopping database generation unit that generates a shopping database of the user according to identity information of the user when the identity of the user is recognized; and

a shopping database updating unit that generates, when the goods are taken away,

shopping information according to the type and quantity of the taken goods and the identity information of the user who takes the goods, and stores the shopping information in the shopping database of the user; wherein the shopping database updating unit, when the goods are put back, generates return information according to a type and quantity of the goods and the identity information of the user who puts back the goods, and deletes the shopping information associated with the return information from the shopping database of the user.

6. A commodity sensing method based on weight monitoring, comprising:

generating a goods database;

placing goods on racks of at least one shelf;

identifying the identity information of each user, which is included in electronic payment information; and generating a shopping database of each user according to identity information of the user when the identity of the user is recognized;

generating at least one shopping database according to the identity information of each user, to record the category and quantity of at least one item taken by each user;

establishing a 3D coordinate system in the closed space in which the goods are located, and obtaining the group of real-time coordinates of each user and his/her extension in the closed space, wherein the group of real-time coordinates including the groups of hand coordinates of each user; at least one image sensor was/were distributed at the top of the closed space, the field of view of the lenses of the image sensors covers the entire bottom surface of the closed space;

collecting a weight sensing value of a rack in real time;

judging a pick or place status by determining whether the weight sensing value of the rack changes or not, wherein if the weight sensing value of the rack becomes smaller,

it is determined that there are goods taken away from the rack; and if the weight sensing value of the rack becomes larger, it is determined that there are articles placed on the rack;

storing the weight sensing value in the goods database to update the weight sensing value of the rack in the goods database in real time;

returning to the step for collecting a weight sensing value of a rack in real time;

determining the identity of a user who takes away or puts back the goods, when there is an intersection between the group of coordinates of the rack space above a rack and the group of coordinates of a user's hand and the weight sensing value of the rack have changed at the same time;

recording the types and quantities of the goods taken away by the user to the user's shopping databases; and

settling a fee by electronic payment according to the shopping database of a user, when the image sensors cannot acquire the real-time 3D image of the user.

7. The commodity sensing method according to claim 6, wherein generating the goods database comprises:

initializing the goods database;

recording a weight value and goods information of each item of the goods, and storing the weight value and the goods information in the goods database; and

collecting the weight sensing value of the rack after the goods are placed thereon, and storing the weight sensing value in the goods database.

8. The commodity sensing method according to claim 6, wherein judging the pick or place status comprises:

calculating a difference value between the weight sensing value of the rack

collected in real time and the weight sensing value of the same rack stored in the goods database, and recording the difference value as a weight difference value of the rack;

comparing the weight difference value of the rack with 0, wherein when the weight difference value of the rack is less than 0, it is determined that there are goods taken away from the rack; and when the weight difference value of the rack is greater than 0, it is determined that there are articles placed on the rack; and

recording a rack number of the rack and the weight difference of the rack when the weight difference of the rack is greater than 0 or less than 0.

9. The commodity sensing method according to claim 8, wherein when all goods on a same rack have a same type and a same weight, judging the pick or place status further comprises:

determining a type of the goods taken away from the rack according to the rack number of the rack and goods information associated with the rack stored in the goods database; and

calculating a ratio of an absolute value of the weight difference of the rack to a weight value of a single item of the goods on the rack, wherein the ratio is rounded, by using a rounding method, to an integer which is a quantity of the taken goods.

10. The commodity sensing method according to claim 6, wherein recording the type and quantity of the goods taken away by each user comprises:

generating, when the goods are taken away, shopping information according to the type and quantity of the taken goods and the identity information of the user who takes the goods, and storing the shopping information in the shopping database of the user; and

generating, when the goods are put back, return information according to a type

and quantity of the goods and the identity information of the user who puts back the goods, and deleting the shopping information associated with the return information from the shopping database of the user.