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(54) **SELF-CHECKOUT SYSTEM**

(75) Inventor: **Takeshi Tashiro**, Shizuoka (JP)

Correspondence Address:
**FRISHAUF, HOLTZ, GOODMAN & CHICK,
PC
220 Fifth Avenue
16TH Floor
NEW YORK, NY 10001-7708 (US)**

(73) Assignee: **Toshiba Tec Kabushiki Kaisha**, Tokyo (JP)

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(57)   **ABSTRACT**

A self-checkout system includes a shopping basket table having a weighing scale, an accounting unit including a scanner to read data of an article and which executes a transaction based on the read data of the article, and a collecting base having another weighing scale. The weighing scale of the collecting base includes an article placing table for supporting the article temporarily.
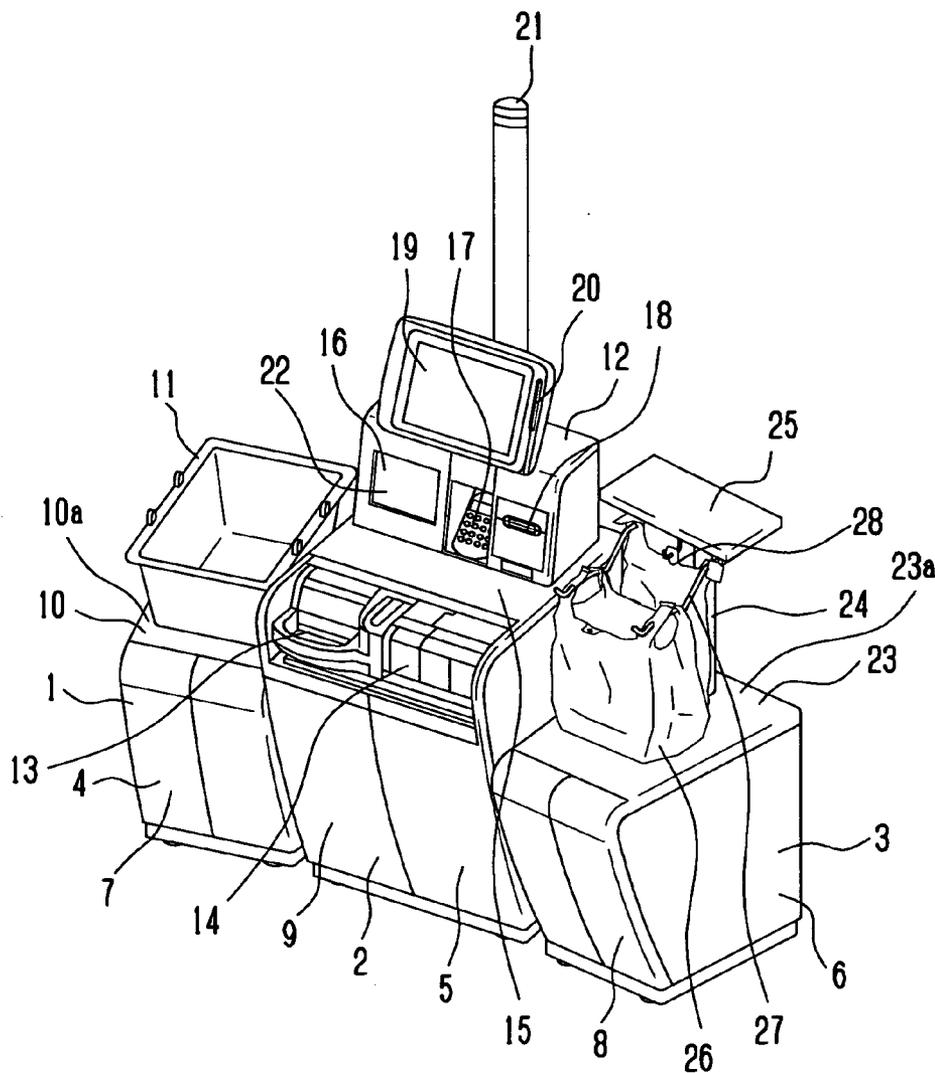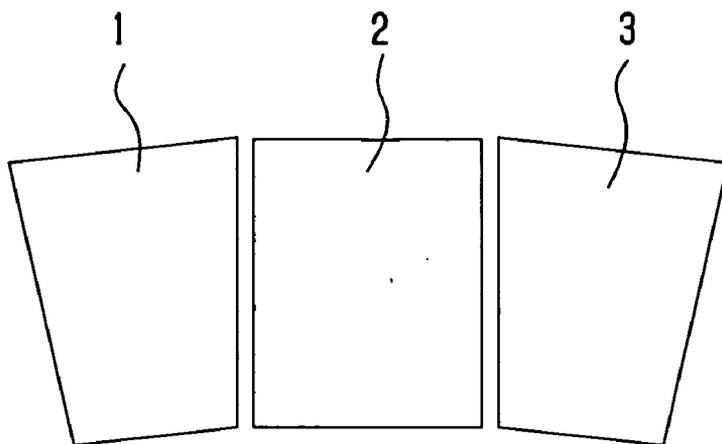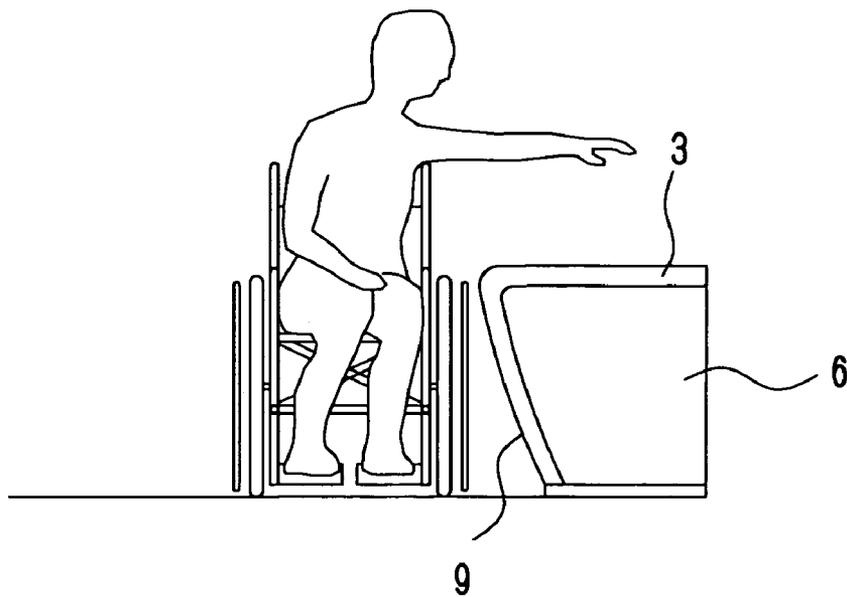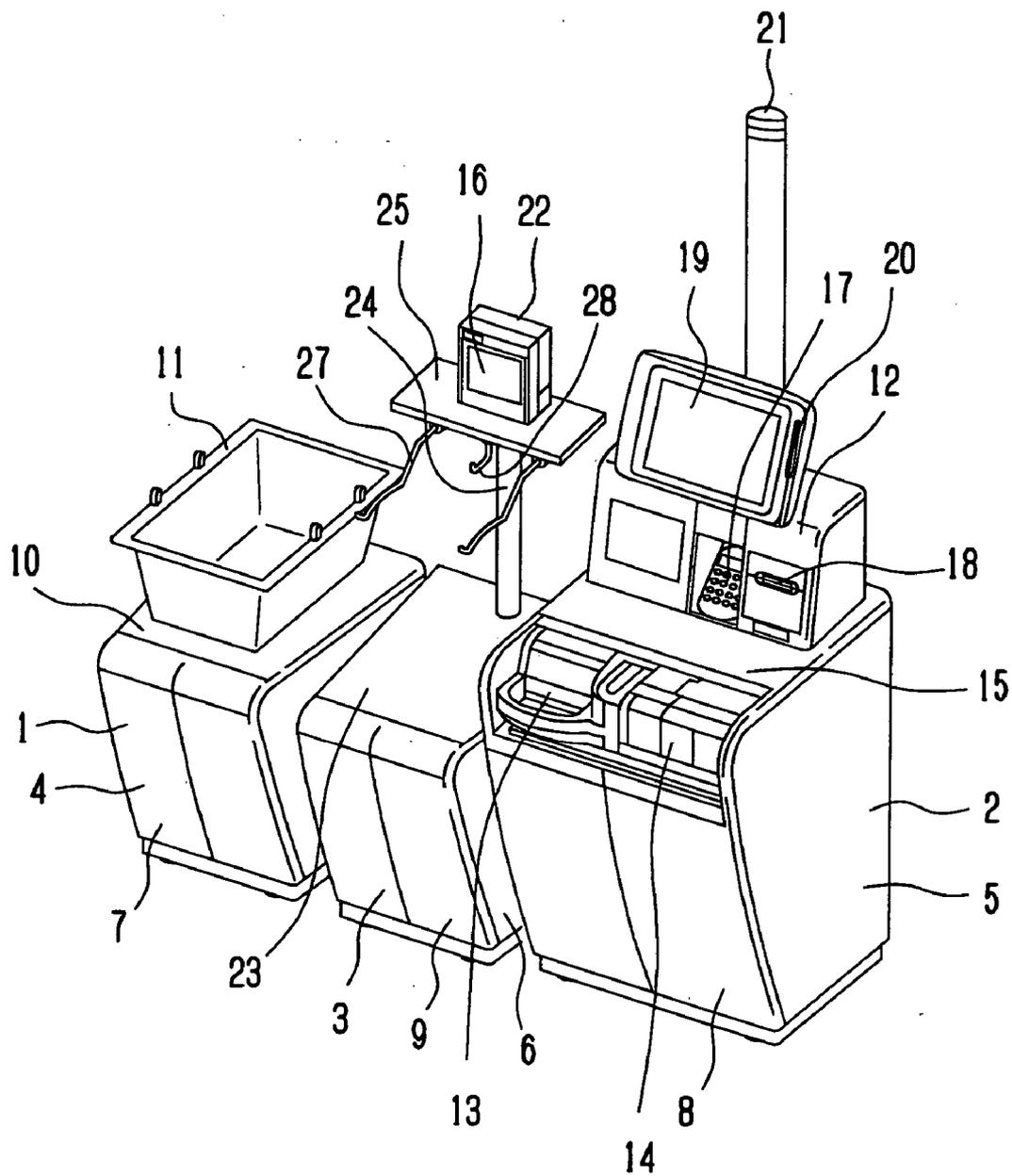
Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

SELF-CHECKOUT SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application is based on and claims the benefit of priority of Japanese Patent Application 2005-047141 filed on Feb. 23, 2005, the entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a self-checkout system which is utilized as a form of accounting system at a super market, and so on.

[0004] 2. Discussion of Related Art

[0005] A conventional self-checkout system comprises a weighing unit for weighing a total weight of a basket in which an article(s) is contained before scanning, an account-ing unit having a scanner for reading a barcode affixed on the article and having a settlement (transaction) function for executing a settlement based on a scanned data read by the scanner, and a collection base having a plastic bag holder that holds a plastic bag used for collecting a scanned article(s), to constitute an integrated self-check out system. The self-checkout system requires verification as to whether the article is registered correctly. Therefore, as shown in Japanese Laid-Open Publication No. 2002-367030, the total weight is weighed at an upstream and a downstream of a flow of the article in an accounting process. That is, a first weighing part for weighing the total weight of the basket in which the article(s) is contained before scanning, a scanner for reading the article information, and a second weighing part for weighing the total weight of a basket in which the scanned article(s) is contained are allocated on a large counter to constitute an integrated self-checkout system.

[0006] In the conventional self-checkout system, a cus-tomer scans the articles and performs an accounting process for himself/herself. During this process, the customer needs to put the articles into a bag. Some kinds of the articles such as cheese, buns, and so on, are easily damaged by defor-mation, and so such articles need to avoid pressure applied by other articles being placed thereon. Therefore, the cus-tomer has to consider which article should be scanned first. That is, the customer needs to choose an article which can go under other articles. Therefore, operability at the scan-ning process is extremely undesirable and ineffective.

[0007] Accordingly, an object of the present invention is to provide a self-checkout system for enabling easy handling of an article which can be damaged by deformation and so on.

SUMMARY OF THE INVENTION

[0008] To achieve the object of the present invention, a self-checkout system is provided which includes: (i) an accounting unit which includes a scanner to scan at least one articles to read data of the article, and which executes a transaction based on the read data of the article, (ii) a collecting base which includes a loading surface for sup-porting the scanned article, and a weighing scale weighing the article supported by the loading surface, and for output-ting a weight value in accordance with a weight of the object, and (iii) an article placing table which is supported above the loading surface by a support extending from the loading surface so as to support at least one said article temporarily.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] A more complete appreciation of the present inven-tion and many of the attendant advantages thereof will be readily obtained as the same becomes better understood by reference to the following detailed description when con-sidered in connection with the accompanying drawings, wherein:

[0010] FIG. 1 is a perspective view showing an embodi-ment of the present invention;

[0011] FIG. 2 is a plane view conceptually showing a lay-out of the embodiment;

[0012] FIG. 3 is a side view showing bodies of a shopping basket, an accounting unit and a collecting base of the embodiment;

[0013] FIG. 4 is a perspective view showing another lay-out of the embodiment; and

[0014] FIG. 5 is a perspective view showing another lay-out of the embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] An embodiment of the present invention will be explained with reference to FIGS. 1 to 5. A shopping basket table 1, an accounting unit 2, and a collection base 3 are formed as separate block bodies 4, 5 and 6, respectively. The body 4 of the shopping basket table 1 and the body 6 of the collecting base 3 have trapezoidal shapes tapering forward (toward the customer) when seen from the top, and front faces 7 and 8 are inclined downward with bottoms of the front faces being recessed backward. A front face 9 of the accounting unit 2 is also inclined downward, and a bottom of the front face 9 is recessed backward. The shopping basket table 1, the accounting unit 2 and the collecting base 3 are arranged laterally in such a manner that adjacent side faces approximately contact each other. Thus, the front faces 7, 8 and 9 of the shopping basket table 1, the accounting unit 2 and the collecting base 3 are arranged along a circular arc.

[0016] The shopping basket table 1 comprises a weighing scale 10 as a pre-weighing scale on the body 4. The weighing scale 10 has a loading surface 10a as a pre-loading surface, and a shopping basket 11, in which a customer puts articles he/she wants to buy, is placed on the loading surface 10a. The total weight of the shopping basket 11 is weighed.

[0017] Further, the accounting unit 2 comprises a settle-ment function part 12 on the body 5. A coin change machine 13 and a bill change machine 14 are provided below the settlement function part 12. A table 15 is provided above the coin change machine 13 and the bill change machine 14. Further, a scanner 16, a password input machine 17 and a receipt printer 18 are provided above the table 15. Still above them, a touch panel 19 and a card reader 20 are provided. At a central back part of the body 5, a lamp 21 is provided. The scanner 16 as a scanner block 22 is covered with a cover and is separable from the body 5.

[0018] Further, the collecting base 3 comprises a weighing scale 23 on the body 6, which is a different weighing scale from the weighing scale 10 as the pre-weighing scale. The weighing scale 23 has a loading surface 23*a*. At a back part of the weighing scale 23, an article placing table 25 is provided via a supporting column 24 standing upward. At a front part of the article placing table 25, a pair of plastic bag hangers 27 for holding an opening of a plastic bag 26 for receiving articles are protruded from the article placing table 25. At a center part of the pair of plastic bag hangers 27, a plastic bag holder 28 for holding layered unused plastic bags 26 is provided. Commonly, approximately one hundred plastic bags 26 are held by the holder 28 and the thickness of the layered plastic bags is about 5 mm.

[0019] According to the structure explained above, as shown in **FIG. 2**, the shopping basket table 1, the accounting unit 2 and the collecting base 3 are arranged in this order from left to right, and they are located in such a manner that adjacent side faces of the bodies approximately contact each other. Since the shopping basket table 1 and the collecting base 2 have trapezoidal shapes tapering forward when seen from the top, the front faces 7, 8 and 9 are arranged in a circular arc, that is, in a fan-like fashion. The shopping basket table 1, the accounting unit 2 and the collecting base 3 are connected with power supply and signal lines through electric wires (not shown). Further, if radio communication is equipped, which does not require hard-wiring, any arrangement of these bodies is possible for effective communication.

[0020] A customer places the shopping basket 11, in which an article he/she wants to purchase is contained, on the loading surface 10*a* of the weighing scale 10. Then, a total weight is transmitted as data to the settlement function part 12, and the customer scans each article by the scanner 16 according to an instruction shown on the touch panel 19, and puts a scanned article into the plastic bag 26 which is hung on the plastic bag hangers 27 at the collecting base 3. The plastic bags 26 are layered and stocked at the plastic bag holder 28, and the customer picks up one of the plastic bags 26 and hangs it open on the plastic bag hangers 27.

[0021] To perform the scanning, the customer takes an article at random from the shopping basket 11 on the shopping basket table 1. When performing the scanning, the customer easily notice whether or not the article that he/she is grasping can go under other articles. If the article can go under other articles, the customer puts the article into the plastic bag 26, and if the article should not be put under other articles, the article is put aside and placed on the article placing table 25 temporarily. After all the articles are scanned, a total weight of all the articles including the article placed on the article placing table 25 is weighed, and it is checked whether or not there have been any dishonest acts (see below). Then, the customer executes the accounting process on the touch panel 19.

[0022] In this accounting process, a payment method as to either by cash or by card is selected. If cash payment is selected, money is paid into the coin change machine 13 or the bill change machine 14, whereas if card payment is selected, a card is swiped through the card reader 20. On completion of the accounting process, a receipt is issued from the receipt printer 18. When there is change, change is given from the coin change machine 13 or the bill change

machine 14, and then checkout is completed. During this process, the total weight including the shopping basket 11 has been weighed by the weighing scale 10 of the shopping basket table 1, and a total weight of the scanned articles is weighed by the weighing scale 23 of the collecting base 3. By comparing the weight which is obtained by subtracting a weight of the shopping basket 11 from the weight data obtained by the weighing scale 10, and the weight obtained by the weighing scale 23, whether or not all the registered articles have been transferred to the plastic bag 26 can be confirmed. Thereby, dishonest acts can be prevented. When the accounting process is completed correctly, the article placed on the article placing table 25 can be placed on a top of the articles in the plastic bag 26, and the customer takes the plastic bag 26 to go home. Here, the accounting unit 2 includes a controller (POS), power supply, and so on to execute control of each machine.

[0023] As described above, by arranging the shopping basket table 1, the accounting unit 2 and the collecting base 3 in a fan-like fashion, a movement of scanning an article which is taken from the shopping basket 11 on the shopping basket table 1 and is put in the plastic bag 26 on the collecting base 3 can be performed with a circular movement in such a way that the customer, who stands in front of the accounting unit 2, turns around. Therefore, the customer can perform a self-checkout process standing at a certain single position. This improves workability.

[0024] Further, as shown in **FIG. 3**, since the front faces 7, 8 and 9 of the shopping basket table 1, the accounting unit 2 and the collecting base 3 are inclined downward with bottoms of the front faces being recessed backward, even a customer with a wheelchair can closely approach the shopping basket table 1, the accounting unit 2 and the collecting base 3, and thereby operability can be improved. This, to be sure, goes for a standing customer, whose toes can be accommodated in the spaces made under the inclined front faces so that he/she can closely approach the shopping basket table 1, the accounting unit 2 and the collecting base 3. This improves workability. Further, as shown in **FIG. 1** with a dashed line, the scanner block 22 can be detached from the accounting unit 2 and can be placed on the article placing table 25. Thereby, scanning of the articles can be performed on the collecting base 3, and therefore the customer's moving distance becomes shortened and operability can be improved.

[0025] It is possible for the customer to execute self-checkout with his/her own shopping bag (not shown). In this case, instead of hanging a plastic bag 26 on the plastic bag hangers 27, the customer can place his/her shopping bag on the weighing scale 23. Then, the scanned articles are put into the shopping bag. Again, the articles which are easily damaged by deformation can be placed on the article placing table 25 temporarily, and then put into the shopping bag later.

[0026] **FIG. 4** is a perspective view showing another arrangement of the shopping basket table 1, the accounting unit 2 and the collecting base 3. Reference numerals used in FIGS. 1 to 3 will be used to designate the same elements in **FIG. 4** (and **FIG. 5**), and the overlapping explanations will be omitted. In this arrangement, the accounting unit 2 is placed laterally on the right side of the shopping basket table 1, and the collecting base 3 is placed at a right angle position

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which faces a customer. Since the shopping basket table **1** and the collecting unit **2** are arranged in line and the collecting base **3** faces the customer at a right angle with respect to other two units, the units as a whole is in L-shaped arrangement. With this arrangement, the moving distance from the shopping basket **11** to the plastic bag **26** is shortened and operability can be improved.

[0027] **FIG. 5** is a perspective view showing another arrangement of the shopping basket table **1**, the accounting unit **2** and the collecting base **3**. In this arrangement, the shopping basket table **1**, the collecting base **3** and the accounting unit **2** are arranged in this order from left to right, and the scanning block **22** is detached from the accounting unit **2** and set on the article placing table **25** of the collecting base **3**. With this arrangement, a reading action of an article can be performed only by an action of transferring the article a short distance between the shopping basket table **1** and the collecting base **3**. Thereby a burden to a customer can be reduced. After scanning all the articles, the customer executes an accounting process in front of the accounting unit **2**, and completes a self-checkout.

[0028] The article placing table **25** of the present invention is positioned above than the weighing scale **23** by being supported by the supporting column **24** extending upward from the weighing scale **23**. Thus, a space for transferring the article above the plastic bag **26** is provided so that operability of the customer is not impaired.

[0029] Further, the plastic bag hangers **27** for holding the plastic bags **26** are provided at the article placing table **25** so that refilling of the plastic bags **26** can be easily performed.

[0030] Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. In particular, the shopping basket table **1**, the accounting unit **2** and the collecting base **3**, or various combinations thereof, can be integrally provided. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

What is claimed is:

1. A self-checkout system, comprising:

an accounting unit which includes a scanner to scan at least one article to read data of the article, and which executes a transaction based on the read data of the article; and

a collecting base which includes a loading surface for supporting each scanned article, and a weighing scale for weighing the supported article and outputting a weight value in accordance with a weight of the article; and

an article placing table which is supported above the loading surface by a support extending from the loading surface so as to support at least one said article temporarily.

2. The self-checkout system according to claim 1, further comprising a shopping basket table which comprises a pre-loading surface for supporting an article that has not yet been scanned.

3. The self-checkout system according to claim 2, wherein the shopping basket table comprises a pre-weighing scale for weighing the article supported by the pre-loading surface.

4. The self-checkout system according to claim 1, wherein the accounting unit and the collecting base are integrally provided.

5. The self-checkout system according to claim 1, wherein the accounting unit and the collecting base are separately provided.

6. The self-checkout system according to claim 2, wherein the shopping basket table, the accounting unit and the collecting base are integrally provided.

7. The self-checkout system according to claim 3, wherein the shopping basket table, the accounting unit and the collecting table are integrally provided.

8. The self-checkout system according to claim 2, wherein the shopping basket table, the accounting unit and the collecting base are separately provided.

9. The self-checkout system according to claim 3, wherein the shopping basket table, the accounting unit and the collecting table are separately provided.

10. The self-checkout system according to claim 1, wherein the article placing table comprises a bag hanger for holding a bag.

11. The self-checkout system according to claim 2, wherein the article placing table comprises a bag hanger for holding a bag.

12. The self-checkout system according to claim 3, wherein the article placing table comprises a bag hanger for holding a bag.

13. The self-checkout system according to claim 4, wherein the article placing table comprises a bag hanger for holding a bag.

14. The self-checkout system according to claim 5, wherein the article placing table comprises a bag hanger for holding a bag.

15. The self-checkout system according to claim 6, wherein the article placing table comprises a bag hanger for holding a bag.

16. The self-checkout system according to claim 7, wherein the article placing table comprises a bag hanger for holding a bag.

17. The self-checkout system according to claim 8, wherein the article placing table comprises a bag hanger for holding a bag.

18. The self-checkout system according to claim 9, wherein the article placing table comprises a bag hanger for holding a bag.

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