Title: Helical Coil Dispenser for Vending Machine

Technical Field

The present invention relates to a dispenser of the helical coil type vending machine.

Background Art

As we know, the current helical coil vending machine is very big, large heavy and bulky and normally occupied a big place. Most of the vending machine at the market design is to suit for product, which is sitting or resting on the drawer or tray type of the dispenser unit.

Because of this, usually we found the helical coil and the goods dispensing slot is big in size. So there is a limitation for small products and sometimes the small product tends to clog between the helical coils and jammed the machine. The known type machine which found no so suitable for this type of products, example like key chain, phone strap, souvenirs, gifts, snacks and etc.

Adaptation of the machine to the type of goods to be sold is obtained in known machines by replacement of the drawers with others having motors and helical coils that are different in number, size and position. Replacement is rather simple but in this case construction of special drawers or availability of a number of trays in excess is required, which adversely affects the purchase and management costs of the machine.

Normally the machines drawer or tray size is fixed and it is not advisable to modify it to suit the market requirement.

Disclosure of Invention

The present invention relates to a helical dispenser for vending machine.

Typically, but not necessary, the present invention applies to sector of dispensing gifts, toys and other product in public places, for example: toys, keychain, phone strap, gifts, snacks, etc.

It is known that machines, which automatically dispense goods, are commonly known as "**Vending Machine**". It comprises a box-shaped structure that is able to store & display goods that are earmark for sale.

The machine comprises a box-shaped structure, which is stacked together with an upper and lower level stacker. It stipulates a double-decked concept. But they share one control system.

Hanging type of helical coil dispenser will display the goods more clearly without obstruction by the helical coil as compared to the known type.

Goods are hung between the turn of each helical coil and each helical coil is mounted parallel to each other. Each helical coil have a specified number, an after inserting enough of money, the user is able to select the desired article on sale by pressing the specified number on the keyboard.

To guide the goods during dispensing operation, a drive rod is in placed at the center of helical coil. The drive rod is use for longitudinal guiding and supporting purpose. It is rested on a metal support and the said metal support is mounted on the wall of the machine.

Each of the drive rods is connected to the individual helical gear and motor. During operation, the gear motor will be engaged, thereby causing the gear to rotate the said drive rod with helical coil along the longitudinal extension axis. The movement causes the goods to move forward one cycle. As the helical coil rotates, it will stop once the item is discharge by the control of the limit switch. As the item reaches the end of the helical coil, the item will drop on to the collection doors on the lower portion of the machine via helping by the slop angle plate. The collection doors of each stacker individually open to enable the user to collect the selected item.

Each of a slop angle plate is mounted at each of the front metal support of helical dispenser so as to guide the item that drop smoothly without any obstruction from the top to the lower portion of each stacker of the machine.

Our invention lies with having the helical coil and drive rod able to be separated with the motor unit so that it enable the items or goods to be taken out or install easily. It is extremely convenient to load the items or products for sale.

In addition to maximize space usage, each motor is mounted besides each of the helical coil of the dispenser and does not block the goods during helical coil rotation.

Basically, several difference shapes and sizes of products are able to load into machine to meet the requirement of a great number of product ranges.

For difference shape and sizes goods requirement, distance between each helical dispenser is adjustable by placing it into the difference u groove of the metal support, they have constant spacing U groove, difference pitch of helical coil also adopted for adjusting the distance between goods with each other. For vertical adjustment, whole level of helical dispenser is able to shift up and down to the certain limit also.

In addition, the number and position of the helical dispenser can be adjustable according to space needed. Number of helical dispenser can be reduce for bigger goods or increase for more quantity loaded.

In particular, it is an aim of the present invention to propose a helical coil dispenser enabling the operation required for change of shapes and sizes of the goods to be simplified and speeded up as compared with the machines of known type.

It is a further aim of the present invention to conceive a machine enabling reduction in sizes and costs for the vending machine.

A helical coil dispenser for vending machines, comprising the features set in one or more of the appended claims substantially achieve the foregoing and further aims.

Description of Drawings and Best Mode for Carrying Out the Invention

Description of a preferred embodiment of a vending machine is now given hereinafter by way of non-limiting example, with reference to the accompanying drawing in which:

- Fig. 1 is a perspective view of vending machine provided with a dispenser of helical coil type, in accordance with present invention.
- Fig. 2 is a perspective view of one of the helical dispenser with metal support plates and a slop angle plate seen Fig.1, which is hanging with the goods and some parts removed for better understanding of others.
- Fig.3 is an enlarged view of the helical dispenser seen in Fig.2.
- Fig.4 is a side view of the dispenser seen in Fig.2 and to show the goods drop smoothly via slop angle plate to the collection door.
- Fig.5 is an enlarge view of rear region of the Fig.3 with the separated parts.

With reference to the drawings, a machine for automatically dispensing goods "P" commonly refers to as "Vending Machine" has been generally denote by 1.

The machine 1 comprises a box-shaped structure 2, which internally confines a space 3 designed to receive the goods or articles "P" to be sold.
Disposed inside the space 3, which found a few level of helical dispensers 4 shown in Fig.2 and consist of some helical coil set shown in Fig. 3 have to hang the goods "P" and carry out handling of them, when selected.

Each level of dispenser 4 shown in Fig.2 comprises a few helical coil set shown in Fig.3 placed on the U groove of the metal support 6, goods "P" which to be sold are hanging on the helical coil 10. During the turn of the helical coil 10, goods "P" will feed and move toward to the end of helical coil 10 and falling via the slop angle plate 5 into lower portion 8 of the machine 1 where an opening 7 allow the user to pick up the selected article "P" which can be shown in Fig 4.

Each helical coil set (Fig.3) of dispenser comprises of one helical coil 10, one drive rod 11, one helical gear 13b, one motor bracket 12, one motor gear 13a with switch lever 15, one motor 14 and one limit switch 16.

In more detail, with reference of Fig. 2, each level of helical dispenser 4 comprises two metal supports 6 for holding drive rods 11. The metal support 6a & 6b was mounted at both sidewall of the machine 1.

A slop angle plate 5 was mounted at the front metal support 6a of helical dispenser as a helping guide the goods "P" dropping smoothly from its top which is shown in the Fig.4 to the lower portion 8 of the machine 1.

At the end of each drive rod was mounted with the helical gear 13a and rest on the U groove of the rear metal support 6b.The helical gear 13a is engaged with another motor gear 13b, which is mounted at the shaft of the motor 14.

There is a switch lever 15 was found at the motor gear 13b which is fixed to the shaft of the motor 14. And a limit switch 16 is attached at the below of the switch lever 15

to control the motor 14 for one cycle turning which in every 360 degree can be shown clearly in Fig.5.

The motor 14 and the limit switch 16 are secured with the motor bracket 12 and tighten to the rear metal support 6b at the specified position.

Upon operation of the push-button panel, the motor unit 14 will drive the motor gear 13b and the motor gear will engage with the helical gear 13a, which the drive rod with helical coil has fixed into this helical gear. And it will cause rotation of the helical coil (10) about its longitudinal axis (X) and carrying the goods forward .The goods "P" will be reached at the end of the helical coil 10 is near to the front metal support 6a and drop to the lower portion 8 of the machine 1.

The distance between each helical coil set shown in the fig.2 can be moved along the "Y" axis by placing it into the constant spacing U groove of the metal support 6. The mainly reason is created for considering the shapes and sizes of goods.

The whole level of the helical dispenser 4 shown in the fig.2 can be adjusted along the vertical direction "Z" with the specified dimension indicated according to the difference product sizes needed.

The difference pitch of helical coil also adopted for adjusting the distance between goods "P" with each other.

The drive rod 11with helical coil 10 was mounted at the helical gear13a are able to removed from the U groove of the metal support 6 for easy loading of goods "P".

The invention reaches to achieve important advantages to save the machine size and costs. Especially save the time of the loading goods "P".

In fact, first of all, the dispenser according to the invention allows adaptation of the number and sizes (pitch) of the helical coils10 at choice, based on the type of the goods "P" to be loaded onto a helical coil 10 of the machine.

In addition, the device of the invention allows this adaptation to be carried out in a simple and quick manner, without disassembling parts of the machine. Therefore, the adaptation operations can be executed by non-qualified staff and having a superficial knowledge of the machine.

Finally, since the machine structure is small and no longer had necessary occupied the bigger area, the manufacture and management costs of the machine are reduced as compared with the machines of known type.

In addition, should the destination of use of a machine be modified, it will be possible to adjust again the position of the components without needing full replacement.

CLAIMS:

1. A helical coil dispenser for vending machines, comprising:

- a plurality of the drive rod (11) with helical coils (10) support by the metal support (6) and each extending along a longitudinal extension axis (X) thereof;
- a plurality of drive rod (11), which located at the center of the helical coil (10) and one ends is mounted on the front metal support (6a) and the other end slot into the helical gear and mounted on the rear metal support (6b).
- a plurality of motor set (Fig 5); there is a shaft at the end of each motor (14), which was connected to the respective motor gear (13b) with switch lever (15). The motor (14) and the limit switch (16) are tightened at the motor bracket (12). The limit switch (16), which located right below the switch lever (15) of the motor gear (13b) to control the rotation of the motor (14).
- The motor gear (13b) is engaged with helical gear (13a), which has mounted at the respective drive rod (11) as well as helical coil (10) to cause rotation of the helical coil (10) about its longitudinal axis (X) and the goods (P) to move forward.
- A slop angle plate (5) was mounted at the front of the front metal support (6a). It is very important for helping guide the goods (P) for dropping purposes.

Characterized in that it further comprises adjusting means (17) allowing movement of the motors set (Fig 5) along the metal support (6) perpendicular to the longitudinal axes (X) and placing of said motors (14) to a plurality of different positions on the U groove along the first direction (Y) of the metal support (6), to enable installation of a different amount of motors (14) and helical coils (10). The metal support (6) can be shifted up or down vertically of the direction (Z) with the specified dimension indicated to allow the different spacing area.

2. A dispenser as claimed in claim 1, wherein the adjusting means (17) enables movement of each motor set (Fig 5) in a plane perpendicular to the longitudinal axes (X), along a first direction (Y) parallel to the metal support (6) and/or along a second direction (Z) perpendicular to the first direction (Y) and to said longitudinal axes (X).

3. A dispenser as claimed in claim 1 or 2, wherein the adjusting means (17) comprises a motor mounted at the motor bracket and plurality of motor bracket (12) mounted along the metal support (6).

4. A dispenser as claimed in claim 1 or 2, wherein the motor set (fig. 5) gear (13b) engaged with the helical gear (13a) to drive the helical coil (10) rotation.

5. A dispenser as claimed in claim 3, wherein the metal support (6) comprises U grooves to place the drive rod (11) the those square holes found under the U grooves are for mounting the motor bracket (12) purposes.

6. A dispenser as claimed in claim 4 when appended to claim 1,wherein the rotation of the helical coil (10) is control by the connection of the switch lever (15) and the limit switch (16) which from the motor set (fig.5).

7 A dispenser as claimed in claim 6 when appended to claim 4, wherein one end of the helical coil (10) was mounted into a hole found at the helical gear (13a) to hold the helical coil (10).

8 A dispenser as claimed in claim 7, wherein the drive rod (11) was wrap around by the helical coil (10), which the drive rod (11) was placed at the center of the helical coil (10) to support the helical coil (10) in Fig 3.

9 A dispenser as claimed in claim 8, wherein the both end of drive rod (11) was placed onto the U groove and holding by the front metal support (6a) and rear metal support (6b).

10. A dispenser as claimed in claim 8, wherein the pitching of helical coil can be adjusted to suit the size of the goods.

11. A dispenser as claimed in claim 9, appended to claim 1, wherein the slop angle plate to be mounted at the front metal support to be as a helping guide the goods dropping.

12. A dispenser as claimed in anyone of the preceding claims, further comprising a plurality of the whole level (Fig 2) can be shifted up or down vertically of the direction (Z) with the specified dimension indicated to allow the different spacing area.