CIRCULATIVE CONVEYOR SYSTEM

Technical Field

This invention relates to a circulative conveyor system for circulating goods and in particular for food and beverages that need to be warmed/heated or kept warm/hot in a restaurant.

Background

Circulating conveyor systems for the circulation of goods and in particular food and beverages in restaurants are well known. The circulating conveyor in a restaurant has been used for a variety of food and beverages but a typical use is for the circulation of sushi in a kaiten sushi restaurant. In a typical conveyor restaurant customers are seated at a table or tables around a conveyor belt, and selects and removes goods that they desire to consume. Such conveyor systems are popular in restaurants because they reduce the number of service staff needed per patron and therefore reduce labour costs. In some countries because of the difficulties of employing service staff for restaurants needing less staff is a benefit in itself.

US application 2002/0056751 Lee is an example of such a system with an improvement that the plates have identifying indicia to indicate the length of time that the goods should be left on the conveyor belt. The improvement enables restaurants to easily meet their requirements under various health regulations and further improve the quality of the food eaten by patrons.

US5477778 Kuwahara teaches a multi tiered conveyor belt system where one tier is for normal goods, one tier is for chilled goods and the third tier is for heated goods. On the heated tier goods are kept warm by a number of electrical heating elements powered by an electrical power rail running below the surface of the conveyor. The heating elements are however exposed and a restaurants patron could accidentally be burned by the element. The elements are also a permanent feature of the conveyor and are not easy to remove either to change the variety of goods that can be displayed on the conveyor or for cleaning.

Steam cooking is frequently used for Chinese dishes typically collectively called dim sum or yum char. Because such dishes need to be kept warm/hot with

steam the conveyor belt of the prior art is not suitable. US 5992301 Mukumoto is an example of a patent that aims to solve the problem of keeping dim sum dishes warm/hot or by cooking them at the table by providing steam reticulation to each table and providing a cooker at each table. Such a system does not have the advantage of cooking the dishes in the kitchen and circulating the dishes for patrons to select that the conveyor system offers.

Summary of the Invention

It is an object of the present invention to provide a circulative conveyor system, which will at least go some way towards improving on the above or which will at least provide the public and the restaurant trade with a useful choice.

In a first aspect the invention consists in a food conveyor system comprising:

a conveyor for transporting goods around a predetermined conveyance path, said conveyor having a conveyor surface upon which said goods can be placed for circulation and a plurality of circulating power supply devices below said conveyor surface, said power supply devices electrically connected to a power rail following the conveyance path below said conveyor surface,

wherein each said power supply devices is connected to an electrical socket on said conveyor surface.

Preferably the electrical supply from each said electrical socket is switchable by a switch.

Preferably said switch is normally off and said switch is moved to an on position by at least one pin of a plug inserted into said socket.

Preferably including a blanking plate to cover said socket when not in use.

Preferably said electrical socket is countersunk below said conveyor surface

Preferably said electrical socket is countersunk below said conveyor surface and said blanking plate when covering said socket is flush with the top of said conveyor surface.

In a second aspect the invention consists in a container for a food conveyor system having a power rail said container comprising:

an electrical heating element fluidly sealed within said container;

a mount for mounting said container on the conveyor surface of said conveyor system; and

an electrical connector for connecting said electrical heating element to said power rail.

Preferably said electrical connector is a plug attached to said container.

Preferably said container has an open top.

Preferably said container is made of heat resistant plastic.

Preferably said container is generally circular and the sides of said container are colored and textured to look like a dim sum or yum char basket.

Preferably said mount includes means to secure said container to said conveyor belt.

Alternatively said electrical connector is a plug attached to said electrical heating element.

To those skilled in the art to which the invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims. The disclosures and the descriptions herein are purely illustrative and are not intended to be in any sense limiting.

Brief Description of Drawings

Figure 1 is a plan view of a typical restaurant conveyor system of the prior art;

Figure 2 is a partial vertically sectioned view of the conveyor system of the present invention shown from the side of the conveyor along the direction of travel of the conveyor;

Figure 3 is a partial vertically sectioned view of the conveyor system of the present invention shown across the direction of travel;

Figure 4 is an exploded partial vertically section view of the container of the present invention; and

Figure 5 is a plan view of the container of the present invention;

Detailed Description of the Invention

Figure 1 shows a typical plan view of a goods conveyor system for a restaurant. The conveyor 11 circulates goods, typically on plates 12 around a fixed path 13. Restaurant patrons seated at tables 14 or bars 15 select items on plates 12 as they circulate past. The kitchen 16 is behind a partition 17 allowing the items taken by patrons to be replaced.

Referring to Figure 2 the conveyor system of the present invention includes a conveyor surface 21 made up of interlocking crescents 22. The conveyor surface is where the items are placed and removed by patrons. Below the surface 21 runs a power rail 23 for the supply of electric power. A container 24 including an electric heating element 25 and an electrical connector 28 is attached to the conveyor surface 21. Electric power is supplied to the electric heating element 25 via a power supply device 26 running along the power rail 23. The power rail 23 runs parallel and along the same path 13 as the conveyor 11.

Referring to Figure 3 the conveyor system of the present invention is shown in a partial vertically section across the direction of travel. In use the conveyor belt is integrated into a stand 34 of suitable height. The electric power rail 23 includes channels for pins 31,32 on the power supply device 26 to connect into. The power supply device 26 support arm 33 is hollow and electricity is conveyed via wires 27 to the electric connector 28.

The electric connector 28 is typically an electric supply socket, which is switchable. In the preferred embodiment electric power is not normally supplied from the electric supply socket unless pins of a plug are inserted into the electric supply socket. The electric supply socket is normally mounted on the conveyor surface 21 so it protrudes above the conveyor surface 21. In an alternative embodiment the socket may be countersunk so that the electric supply socket 28 is below the conveyor surface 21.

A cover not shown may be used to cover the electric supply socket 28 when not in use. With the electric supply socket 28 countersunk the top of the cover is level with the top of the conveyor surface 21. This allows the conveyor system to be built with numerous electric supply sockets 28 but the number of electric supply sockets 28 used could be varied depending upon the menu to be served to patrons.

The container 24 seen in an exploded partial cross section in Figure 4 of the present invention includes an electric heating element 25. The container 24 generally has an open top. In the preferred embodiment the container is made from a heat resistant plastic. The electric heating element 25 is fluidly sealed into the container 24 either with sealant or with a seal of suitable material. In the preferred embodiment the electric heating element 25 is in the bottom of the container. While the container 24 is open topped no fluid can escape from the sides or the bottom in normal usage.

The electric heating element 25 is held in place by studs 44 passing through holes 45 in the container 24 and being secured with nuts 43. An electrical connector 41 in the preferred embodiment providing electric supply to the electric heating element 25 also passes through a hole 46 in the container.

The height of the plug 41 in use is adjusted so that when the electric supply plug 41 and electric supply socket 28 are connected the bottom of the container 47 sits flush on the top of the conveyor surface 21.

While the socket and plug may exert enough force to prevent the container 24 being removed accidentally without the application of force other means may be used to secure the container 24 to the conveyor top 21. Example securing methods include using fixing screws, a circlip joint or a quarter turn thread. While examples have been given any connection method that enabled the container 24 to be held securely but

easily released to enable both the container 24 and the conveyor top to be cleaned would be suitable.

In the preferred embodiment seen in Figure 5 the container 24 is circular 51 in shape. Such a container can provide steam to dim sum or yum char baskets, so that dim sum/yum char can be kept warm/hot while it is circulated around the conveyor. In the preferred embodiment the container 24 is shaped, contoured and colored to look like a dim sum or yum char basket. A lip 48 supports the dim sum or yum char baskets above the container 24.

In order to generate steam water is placed in the container and the electric heating element 25 heats the water producing steam. In order to prevent patrons putting their hands into the hot water a mesh 49 may be placed into the container so that the top of the mesh 49a is above the water level.

While some embodiments of the present invention have been described as preferred and convey particular advantages over other embodiments many other combinations may prove commercially useful.

Claims

1. A food conveyor system comprising:

a conveyor for transporting goods around a predetermined conveyance path, said conveyor having a conveyor surface upon which said goods can be placed for circulation and a plurality of circulating power supply devices below said conveyor surface, said power supply devices electrically connected to a power rail following the conveyance path below said conveyor surface,

wherein each said power supply devices is connected to an electrical socket on said conveyor surface.

2. A food conveyance system as claimed in claim 1 wherein the electrical supply from each said electrical socket is switchable by a switch.

3. A food conveyance system as claimed in claim 2 where said switch is normally off and said switch is moved to an on position by at least one pin of a plug inserted into said socket.

4. A food conveyance system as claimed in any one of the previous claims including a blanking plate to cover said socket when not in use.

5. A food conveyance system as claimed in any one of the previous claims wherein each said electrical socket is countersunk below said conveyor surface

6. A food conveyance system as claimed in claim 4 wherein each said electrical socket is countersunk below said conveyor surface and said blanking plate when covering said socket is flush with the top of said conveyor surface.

7. A container for a food conveyor system having a power rail said container comprising:

an electrical heating element fluidly sealed within said container;

a mount for mounting said container on the conveyor surface of said conveyor system; and

an electrical connector for connecting said electrical heating element to said power rail.

8. A container for a food conveyor system as claimed in claim 7 wherein said electrical connector is a plug attached to said container.

9. A container for a food conveyor system as claimed in claim 7 wherein said electrical connector is a plug attached to electrical heating element.

10. A container for a food conveyor system as claimed in as claimed in any one of claims 7 to 9 wherein said container has an open top.

11. A container for a food conveyor system as claimed as claimed in any one of claims 7 to 10 wherein said container is made of heat resistant plastic.

12. A container for a food conveyor system as claimed in any one of claims 7 to 11 wherein said container is generally circular and the sides of said container are colored and textured to look like a dim sum or yum char basket.

13. A container for a food conveyor system as claimed in any one of claims 7 to 10 wherein said mount includes means to secure said container to said conveyor belt.

14. A food conveyance system as claimed in any one of claims 1 to 6 including a container as claimed in any one of claims 7 to 13