

HOT-POT BASIN CLEANING APPARATUS

TECHNICAL FIELD

The invention relates to the technical field of cleaning equipment, in particular to a hot-pot basin cleaning apparatus.

BACKGROUND

In recent years, hot-pot industry has experienced rapid development in China. According to the data of *China Top 100 Restaurant 2013*, the hot-pot industry has occupied for nearly one-third of the top 100 restaurants in 2013. Compared with the data of 2012, the hot-pot industry developed strongly in which the business income increased by 11.2% and the proportion in total income of the top 100 increased by 1.2% to 25.4%, which was the largest increase among all formats in the restaurant industry.

However, the inventors of the present invention have found that there are at least the following problems in the prior art.

Although the hot-pot industry is easy to achieve standardization and automation, it is still a labor-intensive industry. The service personnel work hard and work long hours, especially for the hot-pot basin cleaning in kitchen, it has higher cleaning strength, worse environment and lower cleaning efficiency, since the hot-pot basin needs to be cleaned at a water temperature above 60 °C.

SUMMARY OF INVENTION

In view of this, an object of the invention is to provide a hot-pot basin cleaning apparatus to reduce the labor intensity and improve the work efficiency.

Based on the above objective, there is provided a hot-pot basin cleaning apparatus, comprising a rack, a hot-pot basin conveying mechanism mounted on the rack, and a hot-pot basin cleaning mechanism arranged between the feeding end and the discharging end of the hot-pot basin conveying mechanism.

The hot-pot basin cleaning mechanism comprises a medium-pressure washing device for cleaning food residue and oil in the hot-pot basin, and a high-pressure rinsing device for cleaning the burnt or scaled residue in the hot-pot basin.

Optionally, the medium-pressure washing device is installed at the feeding end of the hot-pot basin cleaning mechanism, and the high-pressure rinsing device is installed at the discharging end of the hot-pot basin cleaning mechanism.

Optionally, the medium-pressure washing device comprises a medium-pressure washing arm, a

plurality of medium-pressure washing nozzles is mounted on the medium-pressure washing arm, and the plurality of medium-pressure washing nozzles are disposed upward.

Optionally, the plurality of the medium-pressure washing nozzles are arranged in a fan pattern along a transverse direction of the hot-pot basin conveying mechanism, and the water pressure of the medium-pressure washing nozzle is 0.2 MPa to 0.8 MPa.

Optionally, the high-pressure rinsing device comprises a driving motor mounted on the rack, a crank mounted on an output shaft of the driving motor, a connecting rod hinged on the crank, and a rocker hinged on the other end of the connecting rod, wherein the lower end of the rocker is hinged to the rack, and the crank, connecting rod and rocker together constitute a crank-rocker mechanism, and a high pressure nozzle is mounted on the upper end of the rocker.

Optionally, the swinging direction of the high pressure nozzle is perpendicular to the conveying direction of the hot-pot basin conveying mechanism, and the water pressure of the high pressure nozzle is 10 MPa to 20 MPa.

Optionally, the hot-pot basin cleaning mechanism further comprises a washing water tank installed on the rack, wherein the washing water tank is respectively connected to the medium-pressure washing device and the high-pressure rinsing device.

Optionally, a sump tank is arranged under the hot-pot basin cleaning mechanism.

Optionally, the hot-pot basin conveying mechanism comprises two parallel straight-plate chains driven by a conveying motor, wherein the nozzles of the medium pressure washing device and the high pressure rinsing device are installed between the two straight-plate chains.

Optionally, each side of the hot-pot basin conveying mechanism is mounted with a limiting stopper for limiting lateral displacement of the hot-pot basin.

Optionally, the discharge end of the hot-pot basin conveying mechanism is provided with an anti-locking device for preventing the hot-pot basin from being seized on the straight-plate chains.

Optionally, the hot-pot basin cleaning mechanism is provided with a pressing bar, and a vertical distance between the pressing bar and the hot-pot conveying mechanism is greater than a height of the hot-pot basin.

It can be seen from the above that the hot-pot basin cleaning apparatus provided by the embodiment of the present invention can clean the food residue and oil in the hot-pot basin and rinse the burnt or scaled residue by equipping with the medium-pressure washing device and the high-pressure rinsing device. The hot-pot basin can be cleaned step-by-step with excellent

cleaning effect and high cleaning efficiency.

BRIEF DESCRIPTION OF DRAWINGS

Fig.1 is a schematic perspective structural view of an embodiment of a hot-pot basin cleaning apparatus of the present invention;

Fig.2 is a partial enlarged view of part A in Fig.1;

Fig.3 is a schematic view showing the internal structure of an embodiment of a hot-pot basin cleaning apparatus of the present invention;

Fig.4 is a schematic structural view of a high pressure rinsing device in an embodiment of a hot-pot basin cleaning apparatus of the present invention; and

Fig.5 is a schematic structural view of a hot-pot basin conveying mechanism in an embodiment of the hot-pot basin cleaning apparatus of the present invention.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

In order to make the objectives, technical solutions, and advantages of the present disclosure clearer, it is further described in detail below with reference to the accompanying drawings.

The present invention provides an embodiment of a hot-pot basin cleaning apparatus, which can reduce the labor intensity and improve the work efficiency.

Referring to Figs.1-3, the hot-pot basin cleaning apparatus comprises a rack 1, a hot-pot basin conveying mechanism 2 mounted on the rack 1, and a hot-pot basin cleaning mechanism 3 arranged between the feeding end and the discharging end of the hot-pot basin conveying mechanism 2.

The hot-pot basin cleaning mechanism 3 comprises a medium-pressure washing device for cleaning food residue and oil in the hot-pot basin 5, and a high-pressure rinsing device for cleaning the burnt or scaled residue in the hot-pot basin 5.

It can be seen from the above that the hot-pot basin cleaning apparatus provided by the embodiment of the present invention can clean the food residue and oil in the hot-pot basin and rinse the burnt or scaled residue by equipping with the medium pressure washing device and the high pressure rinsing device. The hot-pot basin can be cleaned step-by-step with excellent cleaning effect and high cleaning efficiency.

It should be noted that the food residue and oil cleaned by the medium pressure washing device comprise any residue, liquid, etc. that may remain after the hot-pot basin is used. The medium-pressure washing device is mainly used for cleaning these residues and the high-pressure rinsing device is used for cleaning the tough residue, including but not limited to burnt, scale and the like, that is difficult to be washed out by the medium-pressure washing device.

As shown in Figs.1, 2 and 3, the present invention also provides an embodiment of the hot-pot basin cleaning apparatus. The hot-pot basin cleaning apparatus comprises a rack 1, a hot-pot basin conveying mechanism 2 mounted on the rack 1 for conveying the hot-pot basin 5, and a hot-pot basin cleaning mechanism 3 arranged between the feeding end and the discharging end of the hot-pot basin conveying mechanism 2 for cleaning the hot-pot basin 5 while conveying it. A sump sink 4 is disposed under the hot-pot basin cleaning mechanism 3 for collecting the washing water. The hot-pot basin cleaning mechanism 3 comprises a washing water tank 301 mounted on the rack 1, wherein an medium-pressure washing device for cleaning food residue and oil in the hot-pot basin 5 is connected to the washing water tank 301, and a high-pressure rinsing device for cleaning burnt or scaled residue in the hot-pot basin 5 is also connected to the washing water tank 301. The hot-pot basin 5 is cleaned step by step with good cleaning effect and high cleaning efficiency. The medium-pressure washing device is installed at the feeding end of the hot-pot basin cleaning mechanism 3, and the high-pressure rinsing device is installed at the discharging end of the hot-pot basin cleaning mechanism 3. The food residue and oil which are easily washed out in the hot-pot basin 5 can be cleaned by the medium-pressure washing device, and then the tough residue such as burnt or scaled residue can be rinsed by the high-pressure rinsing device.

In the embodiment, the medium-pressure washing device comprises a medium-pressure washing arm 302 communicated with the washing water tank 301, wherein a plurality of medium-pressure washing nozzles 303 are mounted on the medium-pressure washing arm 302, and the plurality of medium-pressure washing nozzles 303 are disposed upward. Preferably, the plurality of medium-pressure washing nozzles 303 are arranged in a fan pattern along the lateral direction of the hot-pot basin conveying mechanism 2, so that the washing area can be expanded and the lateral full section of the hot-pot basin 5 can be cleaned. The water pressure of the medium-pressure washing nozzle 303 is preferably 0.2 MPa to 0.8 MPa, and the food residue and the oil can be cleaned off under this pressure.

The medium-pressure washing device adopts a plurality of medium-pressure washing nozzles arranged in a fan pattern along the transverse direction of the hot-pot basin conveying mechanism, so that all the cross sections of the hot-pot basin can be cleaned and the cleaning area can be expanded, and the cleaning effect is improved.

As shown in Fig.4, in the embodiment, the high-pressure rinsing device comprises a driving motor 304 mounted on the rack 1. A crank 305 is mounted on the output shaft of the driving motor 304, and a connecting rod 306 is hinged on the crank 305. The other end of the connecting

rod 306 is hinged with a rocker 307, and the lower end of the rocker 307 is hinged to the rack 1. The crank 305, connecting rod 306 and rocker 307 together form a crank-rocker mechanism for transmission of motion. A high-pressure nozzle 308 is mounted at the upper end of the rocker 307, and the high-pressure nozzle 308 is in communication with the washing water tank 301. The washing water in the washing water tank 301 is jetted through the high-pressure nozzle 308, and the hot-pot basin 5 is rinsed by swinging and jetting of the high-pressure nozzle 308 with swinging of the rocker 307 driven by the driving motor 304. The rinsing area can be effectively expanded by swinging and jetting of the high-pressure nozzles 308, and only a small number of high-pressure nozzles 308 (one to two) can be provided to obtain a good cleaning effect. The swinging direction of the high-pressure nozzle 308 is preferably perpendicular to the conveying direction of the hot-pot conveying mechanism 2, and the water pressure of the high-pressure nozzle 308 is 10 MPa to 20 MPa, and the burnt or scaled residue can be effectively cleaned under this pressure.

The high-pressure nozzle driven by the crank-rocker mechanism has a simple structure for high-pressure rinsing operation. The swinging jet of the high-pressure nozzle can enlarge the cleaning area, improve the cleaning efficiency, and reduce the number of high-pressure nozzles, so that arrangement of only one or two high-pressure nozzles can obtain a good cleaning effect.

As shown in Figs.1 and 5, in the hot-pot basin washing apparatus, the hot-pot basin conveying mechanism 2 comprises two parallel straight-plate chains 201 driven by a conveying motor. Each nozzle of the medium-pressure washing device and the high-pressure rinsing device is installed between the two straight-plate chains 201. The two straight-plate chains 201 are used as the conveying mechanism, and the hot-pot basin is reverted on the two straight-plate chains 201. There is sufficient space between the two straight-plate chains 201, so that the nozzles of the medium-pressure washing device and the high-pressure rinsing device are conveniently arranged into the space. There is no obstruction below the hot-pot basin 5 to ensure that the washing water can smoothly hit on the hot-pot basin 5. A limiting stopper 6 is mounted on each side of the hot-pot basin conveying mechanism 2 to limit the lateral displacement of the hot-pot basin 5, so as to prevent the hot-pot basin 5 from slipping down from both sides of the hot-pot basin conveying mechanism 2 during the conveying process. An anti-locking device 7 for preventing the hot-pot basin 5 from being seized on the straight-plate chains 201 is provided at the discharge end of the hot-pot basin conveying mechanism 2. When the hot-pot basin 5 is transported to the anti-locking device 7, the anti-locking device 7 can lift the end of the hot-pot basin 5 to avoid seizing. A pressing bar 309 is provided in the hot-pot basin cleaning mechanism 3, and the vertical distance between the pressing bar 309 and the hot-pot basin conveying mechanism 2 is greater than the height of the hot-pot basin 5. When the hot-pot basin 5 is washed in the hot-pot basin cleaning mechanism 3, it is easy to be turned up under the action of water pressure, but the pressing bar 309 can restrict the hot-pot basin 5 so that the hot-pot basin 5 is not overturned when passing through the washing area.

Two parallel straight-plate chains are used as the hot-pot basin conveying mechanism, and there is enough space between the two straight-plate chains to conveniently arrange the nozzles of the medium-pressure washing device and the high-pressure rinsing device, and ensure that the washing water can smoothly hit on the hot-pot basin 5.

It should be noted that the foregoing embodiment provides a hot-pot basin conveying mechanism with two parallel straight-plate chains. It can be known that, in addition to the hot-pot basin conveying mechanism of straight-plate chains, the hot-pot basin conveying mechanism comprising a conveyor belt can be used. The medium-pressure washing nozzle and the high-pressure nozzle can be detachably arranged, thereby facilitating the replacement and cleaning of the nozzle. The medium-pressure washing nozzle and the high-pressure nozzle may also be arranged in an mobilizable way, such that the medium-pressure washing nozzle and the high-pressure nozzle can move or swing in a horizontal and/or vertical direction. In addition to single nozzle structure, the high-pressure nozzle can also adopt a horn double nozzle structure or a multi-nozzle system with different angles. The hot-pot basin conveying mechanism and the washing water tank may share a driving motor or respectively equipped with a driving motor. These alternative embodiments are intended to be included within the scope of the invention, and the scope of the invention should not be limited to the specific embodiments as described.

It should be understood by those of ordinary skill in the art that the disclosure is only specific embodiments of the present invention and is not intended to limit the present invention. Any modifications, equivalent replacements and improvements made within the spirit and principle of the present invention should be included in the scope of the present invention.

What is claimed:

1. A hot-pot basin cleaning apparatus comprising a rack (1), wherein a hot-pot basin conveying mechanism (2) is mounted on the rack (1), and a hot-pot basin cleaning mechanism (3) is arranged between the feeding end and the discharging end of the hot-pot basin conveying mechanism (2); wherein the hot-pot basin cleaning mechanism (2) comprises a medium-pressure washing device for cleaning food residue and oil in the hot-pot basin (5), and a high-pressure rinsing device for cleaning the burnt or scaled residue in the hot-pot basin (5); wherein the medium-pressure washing device is installed at the feeding end of the hot-pot basin cleaning mechanism (3), and the high-pressure rinsing device is installed at the discharging end of the hot-pot basin cleaning mechanism (3); wherein the medium-pressure washing device comprises a medium-pressure washing arm (302), a plurality of medium-pressure washing nozzles (303) are mount on the medium-pressure washing arm (302), and the plurality of medium-pressure washing nozzles (303) are disposed upward; wherein the plurality of the medium-pressure washing nozzles (303) are arranged in a fan pattern along a transverse direction of the hot-pot basin conveying mechanism (2), and the water pressure of the medium-pressure washing nozzle (303) is 0.2 MPa to 0.8 MPa; wherein the high-pressure rinsing device comprises a driving motor (304) mounted on the rack (1), a crank (305) mounted on an output shaft of the driving motor (304), a connecting rod (306) hinged on the crank (305), and a rocker (307) hinged on the other end of the connecting rod (306), wherein the lower end of the rocker (307) is hinged to the rack (1), and the crank (305), connecting rod (306) and rocker (307) together constitute a crank-rocker mechanism, and a high-pressure nozzle (308) is mounted on the upper end of the rocker (307), and the water pressure of the high-pressure nozzle (308) is 10 MPa to 20 MPa; wherein the swinging direction of the high-pressure nozzle (308) is perpendicular to the conveying direction of the hot-pot basin conveying mechanism (2) and the high-pressure nozzle (308) is single; wherein the hot-pot basin conveying mechanism (2) comprises two parallel straight-plate chains driven by a conveying motor, and the nozzles of the medium-pressure washing device and the high-pressure rinsing device are installed between the two straight-plate chains; wherein each side of the hot-pot basin conveying mechanism (2) is mounted with a limiting stopper (6) for limiting lateral displacement of the hot-pot basin (5); wherein the discharge end of the hot-pot basin conveying mechanism (2) is provided with an anti-locking device (7) for preventing the hot-pot basin (5) from being seized on the straight-plate chains (201)..

2. The hot-pot basin cleaning apparatus of claim 1, wherein the hot-pot basin cleaning mechanism (3) further comprises a washing water tank (301) installed on the rack (1), and the washing water tank (301) is respectively connected to the medium-pressure washing device and the high-pressure rinsing device.

3. The hot-pot basin cleaning apparatus of claim 1, wherein a sump tank (4) is arranged under the hot-pot basin cleaning mechanism (3).

4. The hot-pot basin cleaning apparatus of anyone of claims 1-3, wherein the hot-pot basin cleaning mechanism (3) is provided with a pressing bar (309), and a vertical distance between the pressing bar (309) and the hot-pot conveying mechanism (2) is greater than a height of the hot-pot basin (5).