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(54) **Cup cleaning and drying device**

(57) The present invention relates to a machine for cleaning and drying of glasses, being particularly applicable to glasses of difficult cleaning, which comprises a lower base structure (6) to the engine housing (1), whose vertical axis, attached to the axis of the central gear-wheel of the set of gear-wheals (4) that act as basis to the support axis (7) of the chamois leather brushes for cleaning (2, 3) that when in rotary motion open and create the ideal environment for cleaning throughout the interior and exterior surface of the glass, an exterior box that protects the user from eventual breaking of glass, a lid on the top of the machine, which works as a switch turning on or off as the engine is shut or open respectively.

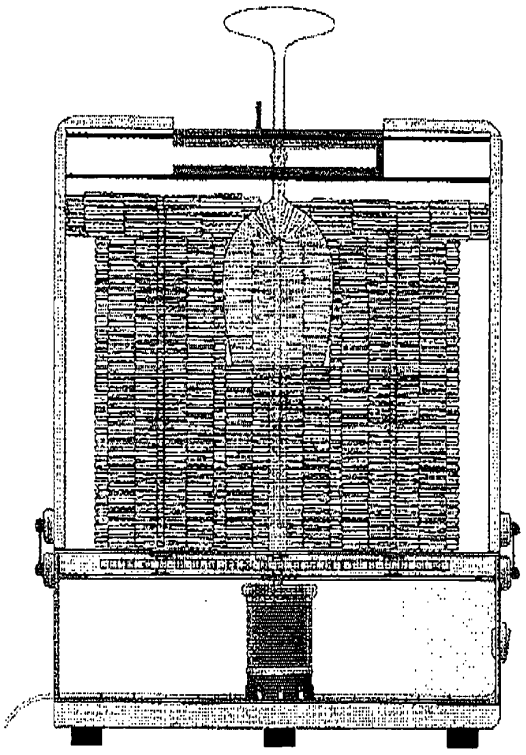

fig. 10

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Description

TECHNICAL FIELD

[0001] In the catering establishments, after being washed in the machine, glasses and cups have to be cleaned with a cloth, only then it is possible to keep the glass/cup clean.

[0002] Currently, cleaning and drying of glasses or cups in catering establishments, such as bars or restaurants, represents a monotonous, tiresome and thankless task, because those tasks are performed manually and require the handling of large amounts of glasses or cups.

[0003] If it is true that some of the glasses used do not present great difficulty of cleaning, there are others that for being taller and narrow, are almost impossible to manually clean in perfection.

[0004] In general, it is observed that a high percentage of hotel establishments do not consider the cleaning of the glass as one of its priorities.

[0005] This task of cleaning and drying of glasses is still nowadays performed manually, using cloths not always of exclusive use, neither in the best condition and hygiene.

[0006] In the specific case of the glass, to which the machine corresponding to this invention is especially appropriate, it can be mentioned that a device with these characteristics, besides the benefit that represents fewer hours of work, may create a culture of "glass always clean" with the resulting benefits (public health).

STATE OF THE ART

[0007] There are known many machines that, however, do not aim to solve the technical problems in analysis, problems that the invented machine overcomes with simplicity and effectiveness.

[0008] Next, reference is made to some of those former inventions, since they constitute the state of the art, considered more close to the assessment of the invention which is now submitted as a patent.

[0009] Between the known documents, it is indicated the patent GB 169213, which is a machine for drying and polishing of glasses and similar objects.

[0010] This machine, as defined by the first claim, characterised by being provided with an internal rotary polisher and an external polisher comprising a series of pivoted arms provided with absorbent and polishing surfaces, which external polisher is adapted to be moved axially relatively to the internal polisher but incapable of rotational movement.

[0011] The patented machine features a complex set of mechanisms, while the proposed machine is simple and develops a solution different from the previously adopted.

[0012] Indeed, in this proposed machine the glass is placed in a central axis that is provided with a brush that goes inside the glass [the glass is positioned upside down, contrary to what happens in the prior patent] and, once put into operation, either that axis, or the other four - equally endowed with brushes - come into rotation and the perfect involvement of the glass in these absorbent brushes allows and efficient drying.

[0013] So, in this machine, there is no mechanism that can match the external polisher that not only includes a series of pivoting arms, but is also prevented from any rotation movement and is still designed to hold the glass up and fix it so that it does not rotate.

[0014] Furthermore, the machine to be patented effectively solves the technical problem concerning the cleaning and drying of glasses of high foot, since, with the foot supported by the flexible material that the lid of the machine is provided with, it does not run the risk of falling, or the risk of breaking.

[0015] Then, the machine described in patent GB 169213 has a working not very practical and, since nowadays the glasses are much thinner, it would be expected that the operation of fixing the glasses by adjusting the external polisher would lead to their breaking.

[0016] Another document that is inserted in the state of the art is the patent US 3131408.

[0017] This is a machine for washing glasses equipped with brushes, but the kind that have to be immersed in a cleaning fluid which requires, immediately, that the engine is positioned above the level of that liquid.

[0018] Thus, that is not the object of the invention to be patented.

[0019] In the American invention, which deals with the washing of glasses and not its drying, a glass of high foot, even tucked into the central brush, will not be in a stable position, especially since the brushes are on line, with no cross support.

[0020] The washing of glasses of high foot on this machine requires the constant intervention of an operator.

[0021] An operator to reduce the risk of breaking such a glass, will have to hold it by the base of the foot and if it does it, given the arrangement of the brushes, not all the entire outer surface of the glass will be subject to the cleaning action of those brushes.

[0022] This patent does not solve the problem of the cleaning of glasses of high foot.

[0023] There is still the document CN 201333018 that regards a machine for cleaning and polishing of glasses.

[0024] That document describes a machine with a cleaning system characterised by a set of brushes, but, also in this invention, the problem of drying of glasses of high foot is not solved.

[0025] On the other hand, it should be noted that, being the drying done using brushes that rotate around its axis and not excluding the chance of breaking a glass, a machine in which the drying device is not encapsulated, as is the case in the proposed solution, becomes, in such circumstances, very dangerous.

[0026] This machine is not as open as those described in American and Chinese documents, that one being provided with a device that is embodied in a box with safety

lid.

[0027] This and other technical advantages of the present invention are described in detail below.

DESCRIPTION OF THE INVENTION

[0028] The present invention consists of a machine for cleaning and drying of glasses and cups, whose working is based on the rotary movement of five vertical chamois leather brushes, one as central and the remaining four as side brushes, and driven by axis fixed and centred on the gear-wheels.

[0029] This machine is especially indicated to clean glasses and cups after washing.

[0030] The shape of chamois leather brushes when in rotation movement, open allowing brushing any shape of glass, across its surface.

[0031] In this way, it is possible to take advantage of all the cleaning potential of the brushes in glasses very difficult to clean well, either with regard to the manual process, or regarding known processes.

[0032] Another advantage deals with the fact that with this machine it is obtained a high yield ensuring, on one hand, the security of those handling the glasses and, on the other hand, the brightness and effective cleaning thereof.

Description of the figures

[0033] Making reference to figures, in fig. 1 it is represented the engine, in fig. 2 and fig. 3 the chamois leather brushes, fig. 4 represents the view from the top of a set of 9 gear-wheels, in fig. 5 a side view of the open/close system of the lid of the machine.

[0034] In fig. 6 the lower base structure to the engine housing and in fig. 7 the set of gear-wheels from a side view and the support axis of the brushes.

[0035] Fig. 8 represents the lid on the top of the machine.

[0036] At last, fig. 9 represents the machine with all the elements previously described, and also with the external box with a glass tube type to be cleaned, and finally fig. 10 equal to fig. 9 but depicting the cleaning of a glass type balloon.

Constitution of the machine

[0037] The machine object of the present invention comprises:

1 A lower base structure (6) to the housing of an engine (1) and of a set of nine gear-wheels (4), linked together, formed by a central wheel towards the remaining, whose axis form two crossed lines at 90 degrees each other (4).
Thus, there exist a central gear-wheel, four intermediate and four external (4).
The nine gear-wheels are placed on bearings (not shown).

2 Isolated from the lower base structure, a central vertical axis, fixed and centred on the central gear-wheel, and four other vertical axis, fixed and centred on each of the external gear-wheels(7).
The five axis are of square section.

3 Five brushes (2, 3) that fit into five vertical axis, constituted by flexible chamois leather strips, the central brush having the upper top with an ovoid shape (2) and the four side brushes the cylindrical top of larger diameter relatively to its main body (3). The centre of the brushes has a square section, where the axis fit.

4 An external box that protects the assembly of brushes and the user in case of any breaking of glass, according to figures 9 and 10.

5 An opening at the top of the external box with a safety lid divided in two equal parts (according to figure 8), laid on two gear-rules supported by rails with two small gear-wheels fixed in the centre (5).

6 A cut in half-moon on each side of the lid, forming a central circle filled with flexible material (according to figure 8).

7 The lid on the top of the external box works as a switch turning on or off the engine, as close or open, respectively.

[0038] Thus, the engine object of this invention is characterised by being a mechanical equipment, especially designed to perform the cleaning of glasses, and especially those who, because of their shape, have great difficulty to be cleaned by hand.

Detailed working

[0039] The machine structure is divided into three parts: the lower part where the engine (6) and the set of gear-wheels (4) are housed, the central part where is housed the set of axis that support the five chamois leather brushes (7); and the upper part, the lid (8).

[0040] The engine fixed on the base of the machine (6) is the source of the rotary movement which is transmitted, by an axis, to the central gear-wheel (4).

[0041] Through this central wheel that movement is, in turn, transmitted to the other eight side gear-wheels, which transmit the same movement to the five vertical axis fixed on the central gear-wheel and on the four external roads (4) .

[0042] The intermediate wheels are meant to counteract the movement of the glass originated by the central brush (4).

[0043] The five chamois leather brushes (2, 3), sup-

ported and embedded in five vertical axis (7), when spinning, open forming inside the ideal environment for cleaning and quick drying across all the surface of the glass, inside through the central brush (2) and out through the four surrounding side brushes (3).

[0044] Along the axis of each brush there is a longitudinal hole, of section equal to the one of the axis (7), allowing the user to very easily change the brushes for its washing and drying.

[0045] The lid (8) at the top of the external box works as a switch, turning on or off the engine, as close or open, respectively.

[0046] The safety lid divided in two equal parts (according to figure 8), allows the user to open and close the lid and switch on and switch off the engine with only one hand, freeing the other hand to handle the glasses.

[0047] In the centre of the lid, two cuts in half-moon on each side, form a circle (according to figure 8) that, when filled with spongy material, allows the foot of the glass type balloon to remain outside the lid, without damage.

[0048] Thus, the glass is inserted in the brush of the central axis, as shown in figures 9 and 10, which, after the lid being closed and, thereby, switched the engine, the glass is cleaned through the rotary movement of the brushes, which ends when the lid is open.

Claims

1. Machine for cleaning and drying of glasses and cups, **characterised by** comprising a lower base structure for the housing of the engine (6) and of a set of nine gear-wheels (4), a central, four intermediate and four external linked together, whose axis form two crossed lines at 90 degrees each other (4), five vertical axis (7) of square shape, being one fixed in a central wheel and the other four axis fixed on the external wheels (4, 7), five strip chamois leather brushes, with its square interior fit in the vertical axis, and the central brush has its top of ovoid shape (2) and the rest have their cylindrical top of larger diameter than the total body (3), an external box that protects the user from breaking glass, a lid on the top of the box with a cut in half-moon on each side of the lid forming a central circle filled with flexible material.

2. Machine according to claim 1, **characterised in that** the rotation of the vertical axis is made by an electric engine (1) or any other mechanism.

3. Machine according to claims 1 and 2, **characterised in that** the rotation of the vertical axis is made by gear-wheels (4) or any other mechanism.

4. Machine according to claims 1 and 3, characterised for having a set of two or more gear-wheels (4).

5. Machine according to claims 1, 2 and 3, characterised for having a set of two or more vertical axis (7) in rotation.

6. Machine according to claims 1, 2, 3 and 5, **characterised in that** the vertical axis (7) have a square shape or any other.

7. Machine according to claim 1, **characterised in that** the entry direction of the glasses (9, 10) may be vertical, horizontal or any other.

8. Machine according to claim 1, **characterised in that** the strip brushes (2, 3) are in chamois leather or similar.

9. Machine according to claims 1 and 8, **characterised in that** the top of the brushes have a cylindrical ovoid shape or any other.

10. Machine according to claims 1, 8 and 9, **characterised in that** the interior of the brushes have a square shape or any other.

11. Machine according to claim 1, **characterised by** comprising a lid (5, 8) with a safety device.

12. Machine according to claims 1 and 11, **characterised by** having a cut in half-moon on each side of the lid forming a central circle filled with flexible material (8).

fig. 1

fig. 2

fig. 3

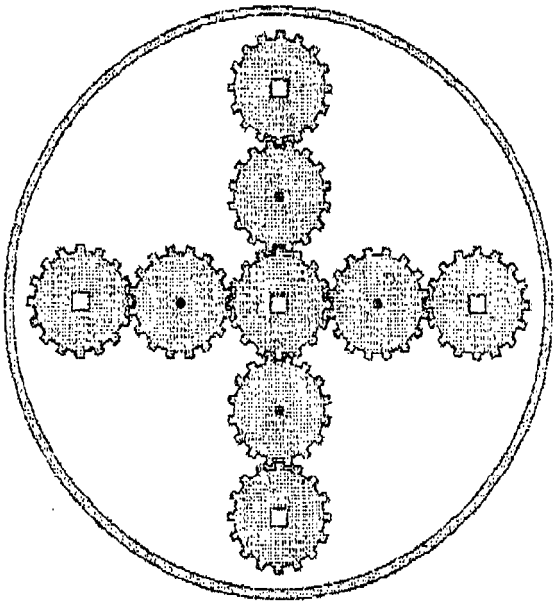

fig. 4

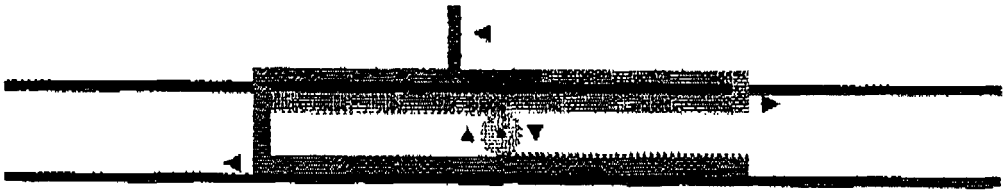

fig. 5

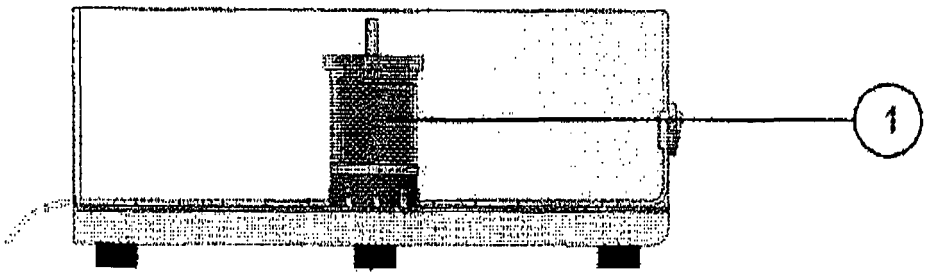

fig. 6

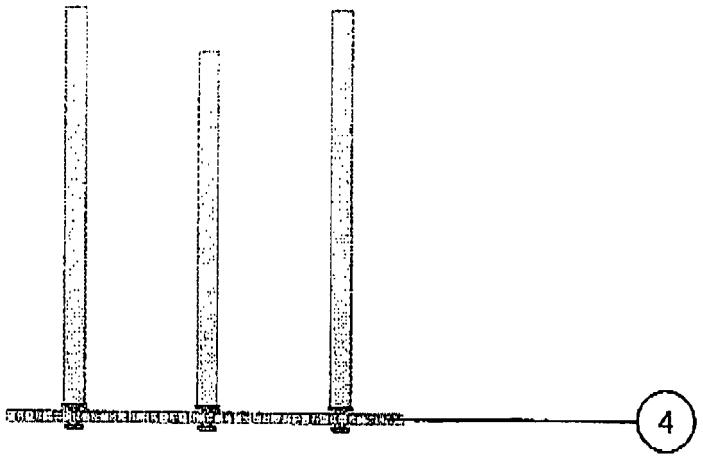

fig. 7

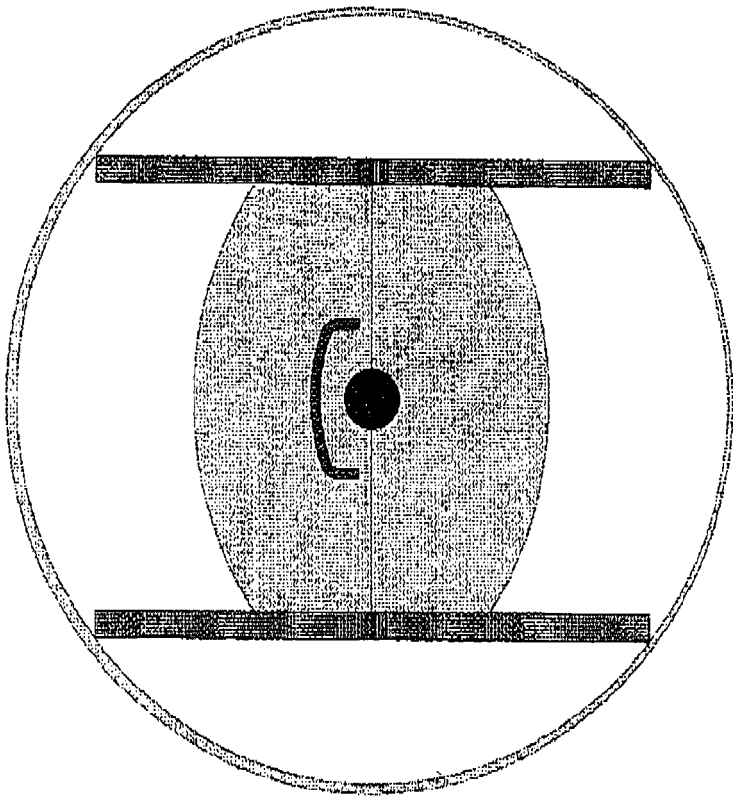

fig. 8

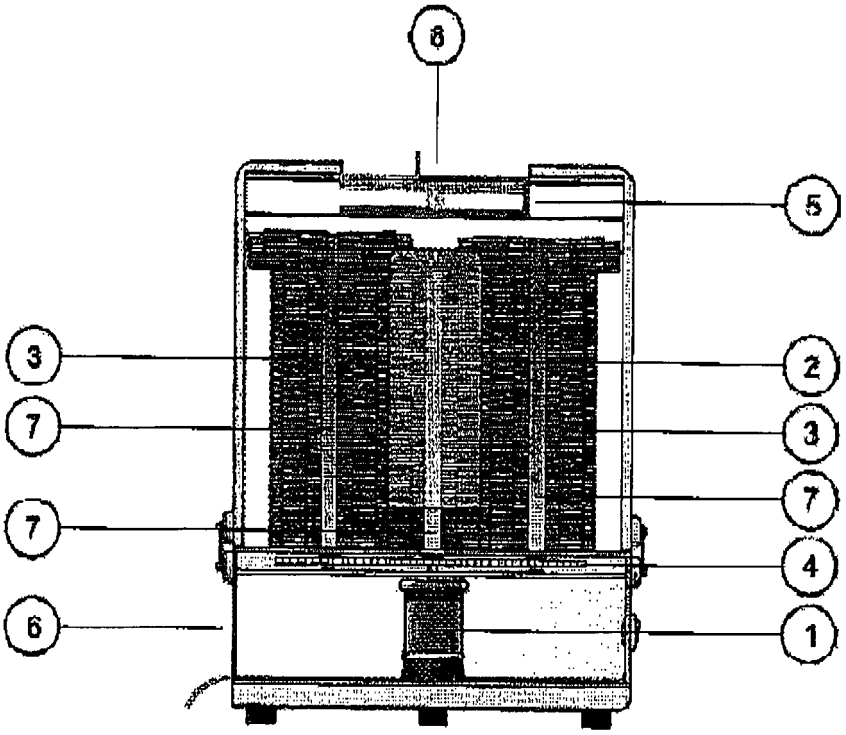

Fig. 9

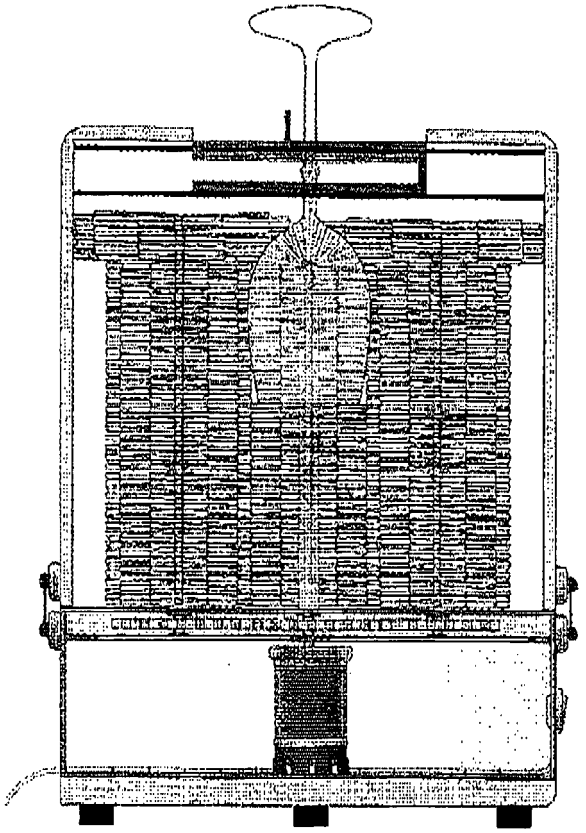

Fig. 10

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 169213 A **[0009] [0015]**
- US 3131408 A **[0016]**
- CN 201333018 **[0023]**