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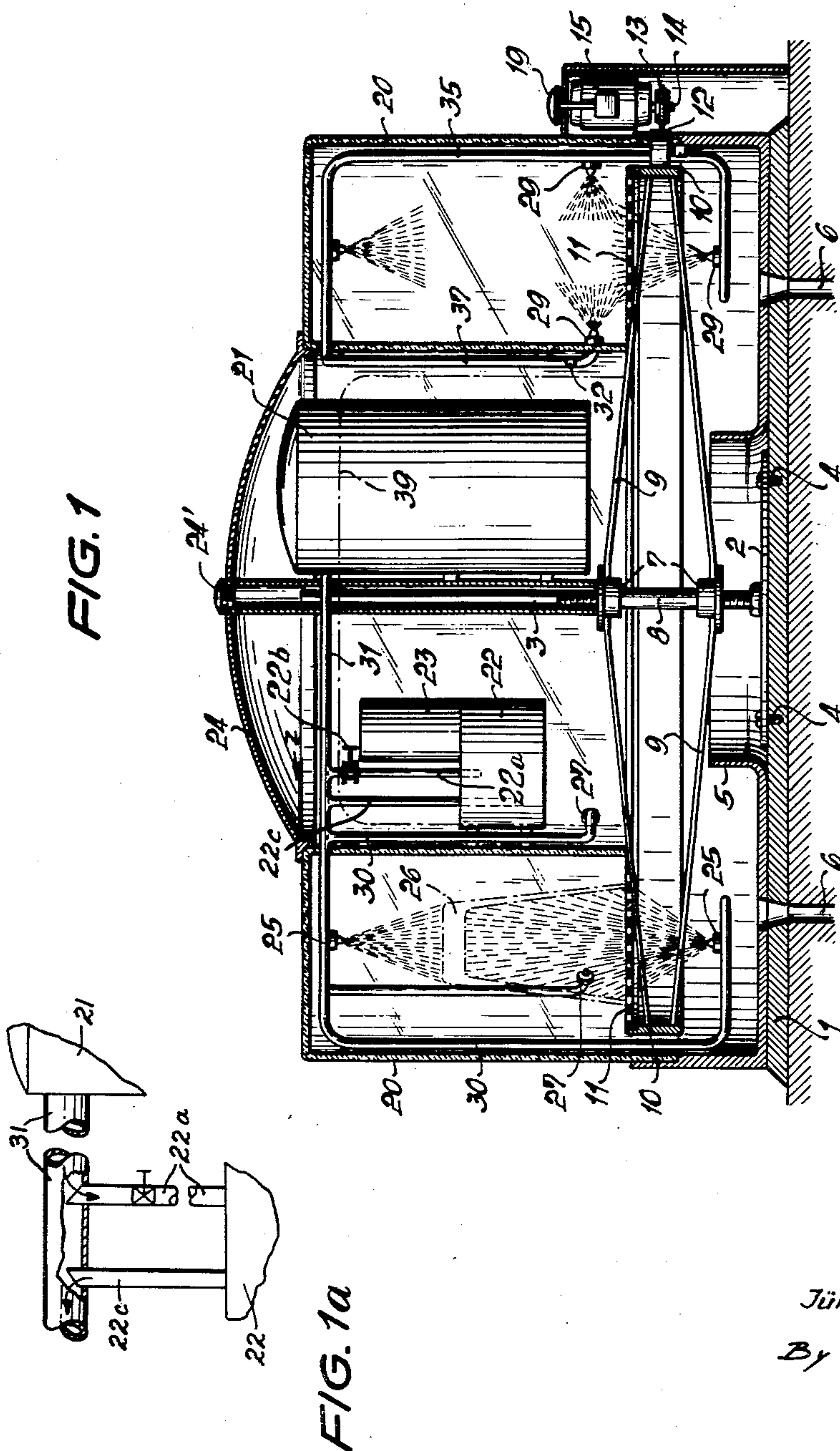
J. KAPHENGST

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DEVICE FOR WASHING AND RINSING DRINKING-VESSELS

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2 Sheets-Sheet 1



INVENTOR

Jürgen KAPHENGST

By

Walter Becher
Patent Agent

Sept. 20, 1960

J. KAPHENGST

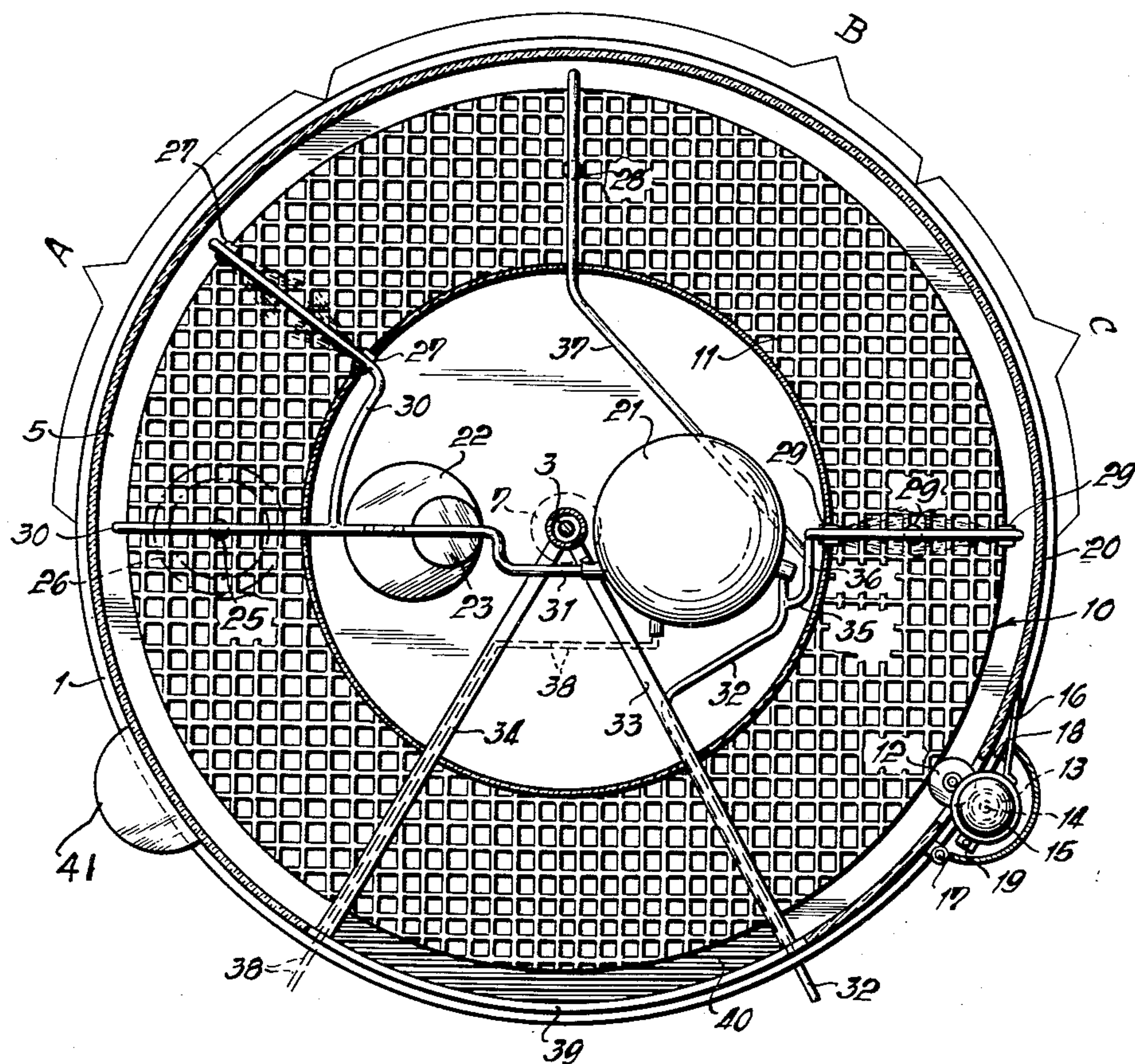
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FIG. 2



INVENTOR

Jürgen KAPHENGST

By

Walter G. G. G.
Patent Agent.

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DEVICE FOR WASHING AND RINSING DRINKING-VESSLS

Jürgen Kaphengst, Dusseldorf-Lohausen, Germany,
assignor to Stierlen-Werke Aktiengesellschaft,
Rastatt, Germany

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The invention relates to a device for washing and rinsing drinking-vessels, in particular glasses. Devices for the cleaning of drinking-vessels are known, in which disinfectants are added to the washing-water while at the same time the quantity of disinfectant and water is being regulated.

Also appliances for the cleaning of glasses and jugs are known which, in a partially confined housing, are equipped with a rotating conveyor for transporting the glasses and jugs and with jets for spraying fresh water upon the vessels.

Furthermore, equipment for the cleaning of drinking vessels, particularly glasses is known in which the glasses are automatically cleaned by hot and cold washing-water flowing from jets arranged above and below a revolving grate that transports the glasses.

All of these known appliances have the drawback that the jets allow the vessels to be sprayed with wash water from two directions only, namely from above and below. Remnants of fats, probably from foods, but in particular waxy and tallowy fats contained in lip-sticks for example, often to be found on the rims of glasses, cannot be removed entirely, even by a thorough rinsing, if the wash water is to be sprayed only from above and below with an admixture of a disinfectant. At least a considerable time is needed if the respective articles are properly to be cleaned.

A perfectly sure, complete and rapid cleansing and rinsing of drinking-vessels is obtained by the device of the present invention, the distinguishing features of which are: the individual spraying jets in the hot water washing zone, of which one sprays hot water into the interior of the vessel while another, arranged opposite thereto, sprays hot water onto the bottom of the vessel from the outside, whereas two other opposing jets spray hot water sidewise against the outside wall of the vessel. Furthermore, at least two sets of jets in the cold water zone are distributed over the circumference of the annular conveyor. Of these sets of jets, a first set equipped with at least two sprinkling jets sprays the vessels with cold water for the purpose of precooling the same, while a second set, preferably equipped with four jets, sprays the vessels with cold water for the final cooling thereof.

According to one embodiment of the invention, the conveyor equipment designed as a spoked wheel, preferably with wire spokes, comprising a trellis work conveyor platform, preferably of a thermoplastic material, is mounted on a vertical central shaft by means of a ball bearing and is revolved by means of a friction wheel. The said friction wheel acts upon the outer rim of the conveyor wheel and is driven by a spring-suspended adjustable electric motor.

Arranged within the housing is a continuous heater for heating the fresh water. Also arranged in said housing is a dosing equipment for apportioning and adding cleansing material and disinfectant. The continuous heater is fitted to the cold water supply-pipe, and the dosing

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equipment is connected to the hot water supply-pipe emerging out of the continuous heater. Further, an appliance for the control of the dosing equipment is provided.

5 An embodiment of the invention is illustrated in the drawing, in which

Fig. 1 is a front-view of the glass washing machine according to the invention.

10 Fig. 1a illustrates on a somewhat larger scale than that of Fig. 1 the connection of the dosing equipment for cleaning material and disinfectant with the warm water supply line of the machine according to Fig. 1.

Fig. 2 is a plan view of the glass washing machine of Fig. 1.

15 The glass washing machine consists of a round base 1, on which, in its center, on a disc 2, the vertically fitted shaft 3 is secured by means of screws 4. Base 1 supports an annular trough 5, the outer diameter of which corresponds to that of base 1, while the inner diameter of trough 5 is slightly greater than the aperture for disc 2. Several outlets 6, extending through the base 1, connect the trough 5 with the drainage system.

20 Rotatably journaled at the lower end of shaft 3, and by means of a ball bearing 7 and a hub 8 is a spoked conveyor wheel, consisting of spokes 9 and the rim 10. On the conveyor wheel is fitted an annular trelliswork grating 11, preferably of thermoplastic material, for carrying the glasses which are to be washed and rinsed. The outer diameter of the grating 11 corresponds to the 30 outer diameter of the conveyor wheel. For purposes of driving the conveyor wheel, the circumferential surface thereof is frictionally engaged by an intermediate wheel 12, which in its turn is frictionally engaged by a rubber coated friction wheel 13, mounted on a shaft 14 of an electric motor 15. By means of the lever 16 and the 35 tension spring 18 an electric motor 15 is urged towards a conveyor wheel. The revolutions of motor 15 can be adjusted by a regulator 19.

40 The upper portion of the glass washing machine is enclosed by a cylinder dome 20, preferably of transparent, or translucent respectively, material as for instance glass or synthetic material e.g. derivatives of acrylic or methacrylic acid which fits into the trough 5. In the center of the dome 20 is a continuous heater 21, a dosing equip- 45 ment 22 and a container 23 holding the cleanser material and disinfectant. At its top end the center of the dome is closed by a removable lid 24, preferably of nickel, into which lighting can be installed. The lid 24 is held down by a locking screw 24'.

50 The plan view according to Fig. 2 shows the three successive stages through which the drinking vessel passes during a washing cycle. At the beginning of the first stage—washing zone A—a spray-jet 25 is arranged above and below the annular trellis grate 11 for the purpose of spraying the inside and outside of the drinking glass 26, as indicated in the drawing by a dot-dash line. Approximately in the middle of the washing zone A there are arranged two further spray-jets 27, one on each side 55 above the trellis grate 11. Also these spray-jets serve to wash the outside wall of the glass, and particularly the upper rim thereof, to which, as is well-known, most of the tenacious impurities adhere. The washing zone A is followed by a precooling zone B which extends clockwise along the trellis grate 11. Approximately in the middle of the precooling zone B, above and below the trellis grate 11, there are arranged spray-jets 28 which 60 spray or sprinkle the hot glass but slightly with cold water to prevent said glass from cracking.

70 Zone B is followed by the final cooling zone C. Towards the end of this zone C, four spray-jets 29 are located one each, above and below and, one each to the left and right of the glass.

The jets 25 and 27 are connected with the dosing equipment 22 by hot water supply pipes 30. The said dosing equipment is connected with the continuous heater 21 via a further hot water pipe 31. The continuous heater 21 is supplied with fresh water from a cold water pipe 32 leading into the heater and supported by a strut 33.

At branch-off point 35 part of the fresh water, after appropriate throttling, is branched-off and conveyed via pipes 36 and 37 to the sprinkling jets 28 and the spray jets 29.

A second strut 34 conducts the electric wiring 38 for the continuous heater 21. On the side opposite the pre-cooling zone B, the transparent dome 20 has a feeder and discharge aperture 39, the lower edge of which is fitted with an intermediate grating 40 which bridges the gap between rim 10 and dome 20. Sidewise on the front of the machine is fitted a sight glass 41 for examining and watching the proper functioning of the dosing equipment 22. The dosing equipment 22 communicates with the hot water pipe 31 through a pipe 22a which comprises a shut-off valve 22b for the control of the dosing equipment. In addition to pipe 22a functioning as feeding line, the arrangement also comprises a pipe 22c functioning as discharge line which leads from the dosing equipment 22 into pipe 31.

As will be evident from the above, especially with reference to Fig. 1a, a portion of the hot water flowing from heater 21 in the direction of arrow Z towards spray-jets 25, is branched off into pipe 22a and thereby passed into the dosing equipment 22. Here it picks up cleaning material and disinfectant and thus charged with these ingredients leaves the dosing equipment 22 while passing through pipe 22c into pipe 31 to flow toward the spray-jets 25. It will be appreciated that the water which flows from heater 21 directly toward the spray-jets 25, in other words, which does not pass through pipes 22a and 22c, creates a suction at the upper mouth of pipe 22c. It will, furthermore, be appreciated that by adjusting valve 22b, it will be possible to control the quantity of water to be passed through the dosing equipment 22 and thereby the amount of cleaning material and disinfectant to be added to the water flowing toward the spray-jets.

The following describes the operation of the machine: When the conveyor wheel has been set in motion, in the direction of the arrow, by switching-on motor 15, by opening fresh water supply tap 32 and by switching-on the continuous heater 21, the vessel to be washed, for example drinking glass 26, is inserted through the feeder aperture 39 and is placed upside down on the annular trellis grate 11. The glass is now transported to the washing zone A where it is sprayed and washed with the hot water solution that squirts out of the spray-jets 25 and 27 and which is made up of water heated to a temperature of at least 60 degrees Celsius by the continuous heater and of cleaning material and disinfectant in the dosing equipment. Glass 26 then moves to the precooling zone B where it is merely sprinkled with cold water to avoid cracking. In the succeeding final cooling zone C, the glass is then sprayed thoroughly with cold fresh water, cooled down to the temperature of the cold water and passed on to the discharge aperture, where it is taken out. The hot fresh water suds and the rinsing and cooling cold water too, are used but once and are drained-off through the outlets 6.

The ball bearing on which the conveyor wheel rotates and the plastic annular trellis grate 11 ensure a perfectly smooth and vibration free progress of the drinking vessel, thus warranting security against breakage. The conveyor wheel is not subject to any wear, thus making any further tensioning or adjustment unnecessary. The friction drive of the conveyor device safeguards the glasses while being cleaned against damage that could arise from a mechanical obstruction through the influence of some foreign substance so that a smooth and continuous operation of the machine is warranted.

Further distinguishing features of the machine of this invention are the immense simpleness of design and construction, only little attention being needed for operating and an independent sequence of operations being attained. It can be readily placed on the counter or bar as a complete unit.

The invention is not limited to the design as shown in the drawing. The number of jets for instance can be increased, or their position in the zones can be altered.

What I claim is:

1. In combination in a washing machine for washing and rinsing drinking vessels, especially drinking glasses: a housing; a conveyor wheel rotatably journaled in said housing and comprising a grate-like supporting surface for receiving and supporting the drinking vessel to be cleansed; a water heater arranged within the central portion of said housing, hot water conveying conduit means communicating with said water heater and extending above and below said conveyor wheel; said housing confining a hot water wash zone, a pre-cooling zone following said wash zone when looking in the direction of rotation of said conveyor wheel, and a final cooling zone following said pre-cooling zone in the direction of rotation of said conveyor wheel; a plurality of first spray nozzle means communicating with said conduit means and respectively arranged in said wash zone above and below said conveyor wheel for spraying and washing the inside and outside of a vessel on the respective portion of said grate-like supporting surface in said wash zone; a plurality of second spray nozzle means communicating with said conduit means and arranged in said wash zone above said conveyor wheel and having their axes directed at an angle to the axes of said first spray nozzle means for washing the outside of a vessel in said washing zone; means mounted in said pre-cooling zone above and below said conveyor wheel and arranged for communication with a cold water feeding line for slightly spraying a vessel in said pre-cooling zone with cool water to pre-cool the same; and means mounted in said final cooling zone below and above said conveyor wheel and arranged for connection with a cool water line for spraying cooling water on a vessel in said final cooling zone to finally cool said last mentioned vessel so that the latter can be safely touched by hand.

2. In combination in a washing machine for washing and rinsing drinking vessels, especially drinking glasses: a housing; a conveyor wheel rotatably journaled in said housing and comprising a grate-like supporting surface for receiving and supporting the drinking vessel to be cleansed; motor means outside the peripheral surface of said conveyor wheel; friction wheel means interposed between and in driving engagement with said motor means and said peripheral surface of said conveyor wheel for driving the latter; a water heater arranged within the central portion of said housing; hot water conveying conduit means communicating with said water heater and extending above and below said conveyor wheel; said housing confining a hot water wash zone, a pre-cooling zone following said wash zone when looking in the direction of rotation of said conveyor wheel, and a final cooling zone following said pre-cooling zone in the direction of rotation of said conveyor wheel; a plurality of first spray nozzle means communicating with said conduit means and respectively arranged in said wash zone above and below said conveyor wheel for spraying and washing the inside and outside of a vessel on the respective portion of said grate-like supporting surface in said wash zone; a plurality of second spray nozzle means communicating with said conduit means and arranged in said wash zone above said conveyor wheel and having their axes directed at an angle to the axes of said first spray nozzle means for washing the outside of a vessel in said washing zone; means mounted in said pre-cooling zone above and below said conveyor wheel and arranged for communication with a cold water feeding

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line for slightly spraying a vessel in said pre-cooling zone with cool water to pre-cool the same; and means mounted in said final cooling zone below and above said conveyor wheel and arranged for connection with a cool water line for spraying cooling water on a vessel in said final cooling zone to finally cool said last mentioned vessel so that the latter can be safely touched by hand.

3. An arrangement according to claim 2, in which said friction wheel means includes a first friction wheel in frictional engagement with the peripheral surface of said conveyor wheel and also comprises a second friction wheel in frictional engagement with said first friction wheel, said motor means being tiltably suspended and having a motor shaft rotatably connected to said second friction wheel and being continuously urged toward said first friction wheel.

4. In combination in a washing machine for washing and rinsing drinking vessels, especially drinking glasses: a housing; a conveyor wheel rotatably journaled in said housing and comprising a grate-like supporting surface for receiving and supporting the drinking vessel to be cleansed; a water heater arranged within the central portion of said housing, hot water conveying conduit means communicating with said water heater and extending above and below said conveyor wheel; a container likewise arranged in the central portion of said housing for receiving and holding cleansing material and disinfectant; dosing means operatively connected with said container for meting out cleansing material and disinfectant from said container; means communicating with said dosing means and also with said conduit means for conveying meted-out cleansing material and disinfectant from said dosing means to said conduit means; said housing confining a hot water wash zone, a pre-cooling zone following said wash zone when looking in the direction of rotation of said conveyor wheel, and a final cooling zone

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following said pre-cooling zone in the direction of rotation of said conveyor wheel; a plurality of first spray nozzle means communicating with said conduit means and respectively arranged in said wash zone above and below said conveyor wheel for spraying and washing the inside and outside of a vessel on the respective portion of said grate-like supporting surface in said wash zone; a plurality of second spray nozzle means communicating with said conduit means and arranged in said wash zone above said conveyor wheel and having their axes directed at an angle to the axes of said first spray nozzle means for washing the outside of a vessel in said washing zone; means mounted in said pre-cooling zone above and below said conveyor wheel and arranged for communication with a cold water feeding line for slightly spraying a vessel in said pre-cooling zone with cool water to pre-cool the same; and means mounted in said final cooling zone below and above said conveyor wheel and arranged for connection with a cool water line for spraying cooling water on a vessel in said final cooling zone to finally cool said last mentioned vessel so that the latter can be safely touched by hand.

5. An arrangement according to claim 4, which includes control means operatively connected with said dosing means for varying the quantity of cleansing material and disinfectant meted out by said dosing means.

References Cited in the file of this patent
UNITED STATES PATENTS

1,332,712	Couch	Mar. 2, 1920
1,707,159	Burnham	Mar. 26, 1929
1,939,308	McEwan	Dec. 12, 1933
2,054,293	McClatchie	Sept. 15, 1936
2,151,437	Ohme	Mar. 21, 1939