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(71) Applicant and
(72) Inventor: **KUMAR, Pramod** [IN/IN]; 42, S.F.S Flats, Sector - 3, Pocket 1 and 2 (Near D.P.S.), Dwarka 110 075, New Delhi (IN).

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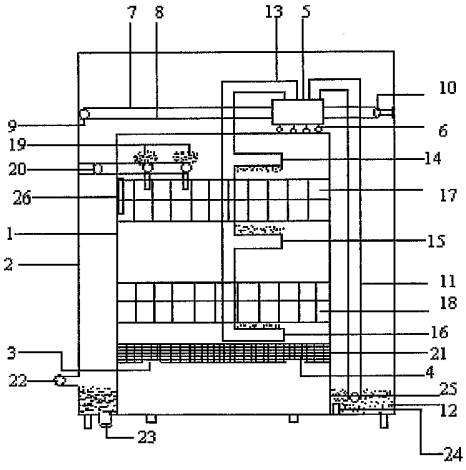
(54) **Title:** DISHWASHER WITH MOVABLE WATER CIRCULATING PUMP



(57) **Abstract:** The dishwasher comprises a steel body (1) with two cage-like stands (17, 18), a false base (25) and slits in its lower portion, placed inside another bigger steel body (2), with their bases joined together. The lower portion serves as a water tank. A water pump (5), with a pipe (11) immersed in water connected to its inlet, and another pipe (13) joined to a set of three pipes (14, 15, 16) having small-small holes which run through these stands, connected to its outlet, is mounted on a stand with wheels (6). This stand is connected to a slow moving motor which can rotate in both the directions. And, as it rotates, the stand also moves from left to right and vice versa. Two scrubbers, motor driven, are positioned on the upper stand to scrub bigger cooking bowls. Used dishes are placed upside down on the stands. Initially, hot water mixed with cleaning liquid, gushes out of the pipes with small-small holes and falls on the inner and outer bodies of the dishes. The stand moves from left to right and vice versa repeatedly. After that, the process is repeated with plain cold water to rinse the dishes. This system uses less water and cleans the dishes in a hygienic manner in very less time.

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DISHWASHER WITH MOVABLE WATER CIRCULATING PUMP

The following specification particularly describes and ascertains the nature of this invention and the manner in which it is to be performed -

This invention relates to a dish-washer, a kitchen device for washing dishes mechanically

The crude method of washing dishes is by hands which is not only time-consuming, but also needs a lot of water and is psychologically repulsive. This dish-washer aims to minimize the housewife's daily chores. It is also the object of this invention to have a device which is very simple in construction, easy for operation and also available at an affordable price.

Thus, according to this invention, a dish-washer for washing dishes mechanically, comprises a steel body placed inside another bigger steel body, with their bases joined together. There are slits/cuts/holes in the lower portion of the smaller body so that water can move from the bigger body into smaller body and vice-versa. The smaller body has a false base to reduce the volume of the lower portion of this unit which serves as a water tank too. A water- pump, mounted on a stand with wheels, rests on top of the smaller body. This stand is connected through strings to a pulley on one side and the pulley of a slow moving motor on another side. This motor can rotate at very slow speed in both clock-wise

and anti clock-wise directions. And as it rotates, the stand also moves from left to right and from right to left. The inlet of the water pump is connected to a pipe which is immersed in the water tank below. The outlet of the water pump is connected to a pipe which is joined to a set of three pipes having a number of small-small holes. The said set of three pipes are connected to another pipe in such a way that each pipe of the said set of three pipes make an angle of 90 degrees with the said connecting pipe. This pipe along with the set of three pipes enters the smaller steel body through a slit in its rear part. The smaller steel body has two cage-like stands for keeping dishes. The positioning of the three pipes having small-small holes is such that the upper stand has a pipe above and a pipe beneath it and the lower stand has a pipe beneath it. Beneath the upper stand are two shafts mounted on thrust bearings. Their upper ends rise a little above the stand and are attached to scrubbers. There are clamps fixed on this stand to hold the dishes, in which food has been cooked, firmly. The pulleys of these shafts are connected, through strings, to the pulley of a fast moving motor. Below the stands and just above the water tank is a very fine net/sieve to filter the water. Inlet and outlet pipes are connected to solenoid valves to fill and drain out water in the water tank respectively. A water heater, fitted with a thermostat, heats water in the tank to the desired temperature. The whole system is electrically connected to suitable timing devices.

Now the invention will be more clearly described with reference to Figures 1, 2 and 3 of the drawings wherein Fig. 1 shows the layout diagram of the dish-washer, Fig.2 shows the stand with wheels, with

water pump along with connected pipes mounted on it, in movement from left to right and from right to left, and Fig.3 shows how the scrubbers rotate and scrub the dishes in which food has been cooked.

Referring to Fig.1, a steel body (1) is place inside another bigger steel body (2) with their bases joined together. There are slits/cuts/holes (3) and (4) in the lower portion of the smaller body so that water can move from the bigger body into smaller body and vice-versa. The smaller body has a false base (25) to reduce the volume of the lower portion of this unit which serves as a water tank (12) too. A water pump (5) mounted on a stand with wheels (6) rests on top of the smaller body. This stand is connected, through strings (7) and (8) to a pulley (9) on one side and the pulley of a slow-moving motor (10) on another side. This motor can rotate at very slow speed in both clock-wise and anti clock-wise directions. And, as it rotates, the stand also moves from left to right and from right to left. The inlet of the water pump is connected to a pipe (11) which is immersed in the water tank below. The outlet of the water pump is connected to a pipe (13) which is joined to a set of three pipes (14, 15, 16) having a number of small-small holes. This pipe, along with the set of three pipes, enters the smaller steel body through a slit (not shown in the figure) in its rear part. The smaller steel body has two cage-like stands (17, 18) for keeping the dishes. On upper stand are placed container dishes (like tumblers, cooking bowls, pressure cooker, plates etc.) and on lower stand are kept other dishes like knives, forks, spoons, small bowls etc. in their respective spaces. The positioning of the three pipes having small-small holes is such that the upper stand has a pipe above and a pipe

beneath it and the lower stand has a pipe below it. Beneath the upper stand are two shafts (19) mounted on thrust bearings. Their upper ends rise a little above the stand and are attached to scrubbers. The pulleys of these shafts are connected, through strings, to the pulley of a fast moving motor (20). Bigger bowls used for cooking, like pressure cookers etc., are placed upside down with scrubbers inside their bodies, to facilitate scrubbing when the motor rotates at high speed. They are held firmly in their places by clamps (26) fixed on the upper stand. Below the stands and just above the water tank is a very fine net/sieve (21) to filter water before allowing it to fall into the water tank. Inlet (22) and outlet (23) pipes are connected to solenoid valves (not shown in the figure). When the solenoid valves are activated on passage of current, water gets filled in or drained out of the water tank respectively. A water heater (24), fitted with a thermostat, heats water in the tank to the desired temperature. The entire system is electrically connected to suitable timing devices.

WORKING OF THE INVENTION To start, used dishes are placed on the stands. Tumblers, bowls, etc., are placed upside down on upper stand (17). Bigger bowls used for cooking, like pressure cookers etc. are placed upside down with scrubbers (19) inside their bodies, to facilitate scrubbing when the motor (20) rotates at high speed. They are held firmly in their places by clamps (26) fixed on the upper stand. Other dishes like plates, knives, forks, spoons, etc., are placed in their respective spaces on upper stand (17) and lower stand (18). Water is filled in the tank. Some cleaning liquid is also mixed in it. Heater (24) is switched on. When the temperature of the water reaches a certain point, the heater is automatically

switched off. Temperature of the water is maintained throughout the operation. At this point, the water pump (5), the slow moving motor (10), the fast moving motor (20) are all simultaneously activated. These are all attached to suitable timing device(s). When the water pump is switched on, it sucks hot water and transmits it to pipe
number (14). The hot water mixed with cleaning liquid is then distributed to all the pipes and forces its way out from the tiny holes with great speed and pressure. At the same time, the fast moving motor (20) starts rotating at high speed and along with it the attached shafts with scrubbers also rotate. The big bowls placed upside down with scrubbers inside their bodies are thoroughly scrubbed. Simultaneously, the slow moving motor (10) also starts rotating in clock-wise direction and as it rotates the stand with wheels, with water pump along with connected pipes mounted on it, also moves from left to right. After some time, this motor moves in the reverse direction, i.e., in anti-clock wise direction, and as it moves, the stand just referred to also moves from right to left. This rhythmic movement goes on. As the pipes move, hot water mixed with cleaning liquid is put on the inner and outer bodies of all the dishes. Food particles and oil etc. fall down and remain in the net/sieve (21) below. The water passes through the net/sieve and goes back into the tank and is thus recycled a number of times in a span of 2-3 minutes with the result that all the dishes have been washed with the cleaning liquid mixed hot water and have been thoroughly cleaned. They have only to be rinsed now.

For rinsing, the water pump, the slow moving motor, the fast moving motor, the heater, are switched off and the solenoid valve in the

drainage pipe activated to drain out water. When the tank becomes empty, the solenoid valve in the inlet pipe (22) is activated and the tank is again filled with water. After that the entire process referred to above is repeated with the only difference that now cold water is used instead of hot water. In about 1-2 minutes all the dishes are rinsed. The solenoid valve in the drainage pipe is again activated to drain out water. The dishes can either be taken out of the shelves or allowed to remain there to become completely dry.

The entire process of washing about 60-70 dishes is thus completed in a very short time.

Thus this invention is very simple and most effective for washing dishes mechanically.

ADVANTAGES This system saves a lot of time otherwise spent on washing dishes manually, uses less water and cleans the dishes in a hygienic manner untouched by hands.

I claim –

1.A dishwasher for washing dishes mechanically, comprising a smaller steel body and a bigger steel body, a water pump for lifting water from the water tank and conveying it to the dishes to be washed, means for such lifting of the water and conveying it to the dishes to be washed, for supporting the dishes to be washed, for scrubbing the dishes in which food has been cooked, for filling the water tank with water and for draining the dirty water, for filtering the dirty water before it is recycled and for controlling the various functions of the dishwasher.

2.A dishwasher as claimed in claim (1) wherein the smaller steel body is contained in the bigger steel body .

3.A dish-washer as claimed in claims 1 and 2 wherein the bases of the smaller steel body and the bigger steel body are joined together.

4.A dish-washer as claimed in claim 1, 2 and 3 wherein the smaller steel body has a false base to reduce the volume of this unit.

5.A dish-washer as claimed in claim 1, 2, 3 and 4 wherein the lower portion of this unit serves as a water tank.

6.A dish-washer as claimed in claim 1 to 5 wherein there are slits/cuts/holes in the lower portion of the smaller steel body so that water can move from the bigger body into the smaller body and vice-versa.

7.A dish-washer as claimed in claim 1 wherein the water pump is mounted on a stand with wheels.

8.A dish-washer as claimed in claim 1 and 7 wherein the said stand with wheels is connected through strings to a pulley on one side (left or right side) and the pulley of a slow moving motor on the other side (left or right side).

9.A dish-washer as claimed in claim 1 and 8 wherein the said slow moving motor can rotate in both clock-wise and anti clock-wise directions and as it rotates, the stand also moves from left to right and from right to left.

10.A dish-washer as claimed in claim 1 wherein the means for lifting of the water from the water tank comprises a pipe which is immersed in the water tank below and connected to the inlet of the water pump.

11.A dish-washer as claimed in claim 1 wherein the means of conveying water to the dishes to be washed comprises a set of three pipes having a number of small-small holes which is connected through another pipe to the outlet of the water pump.

12.A dish-washer as claimed in claim 11 wherein the said pipe connected to the outlet of the water pump and the set of three pipes joined to it enters the smaller steel body through a slit in its rear part.

13.A dish-washer as claimed in claim 12 wherein the set of three pipes referred therein are positioned in such a way that the upper stand has a pipe above and a pipe beneath it and the lower stand has a pipe beneath it.

14.A dish-washer as claimed in claim 13 wherein the set of three pipes have small-small holes in such a way that when water gushes out of them with great force and pressure on activation of the water pump, the movement of the jets of water is downwards from pipe number 14, upwards from pipe number 15 and upwards from pipe number 16.

15.A dish-washer as claimed in claim 13 wherein the said set of three pipes are connected to another pipe in such a way that each pipe of the said set of three pipes make an angle of 90 degrees with the said connecting pipe.

16.A dish-washer as claimed in claim 1 wherein the means for supporting dishes to be washed comprises two cage-like stands in the smaller steel body, called the lower stand and the upper stand, as per their respective positions inside the body.

17.A dish-washer as claimed in claim 1 wherein the means for scrubbing the bigger bowls in which food has been cooked , comprises two shafts which are mounted on thrust bearings on their lower sides and fitted with scrubbers on their upper sides. Their upper ends rise a little above the upper stand.

18.A dish-washer as claimed in claim 17 wherein the said shafts are connected, through strings, to the pulley of a fast moving motor.

19.A dish-washer as claimed in claims 17 and 18 wherein the bigger bowls used for cooking are kept upside down with scrubbers inside their bodies. When the machine is in operation, the fast moving motor rotates at a high speed and along with it the shafts with attached scrubbers also rotate. This results in thorough scrubbing of the dishes in which food has been cooked.

20.A dish-washer as claimed in claim 19 wherein the said bigger cooking bowls are held in their places firmly by clamps fitted with the upper stand so that when the scrubber is an action, they are not swayed away from their respective places but are held firmly by the said clamps.

21.A dish-washer as claimed in claim 1 wherein just below the lower stand and just above water tank is a very fine net/sieve to filter the water.

22.A dish-washer as claimed in claim 5 wherein the said water tank is fitted with a heater connected to a thermostat to heat the water and keep it at the desired temperature.

23.A dish-washer as claimed in claim 1 wherein the means for filling the water tank with water and for draining the dirty water comprises the inlet and outlet pipes, which are connected to solenoid valves, to fill and drain out water from the water tank respectively.

24.A dish-washer as claimed in claim 1 and 23 wherein the solenoid valves are kept activated till such time, by suitable timing devices, as is necessary to fill the desired quantity of water or to drain it out, and then deactivated

25. A dishwasher substantially as hereinbefore described and as illustrated in Figures 1,2 and 3 of the drawings accompanying the complete specification.

AMENDED CLAIMS

[received by the International Bureau on 05 September 2005 (05.09.05);
original claims 1, 3-4, 8, 10, 17, 20, 23 amended; ; original claim 25 cancelled; new claim 26 added:
remaining claims unchanged (6 pages)]

+ STATEMENT

1.A dishwasher for washing dishes mechanically, comprising a smaller steel body and a bigger steel body, a water pump for lifting water from the water tank and conveying it to the dishes to be washed, pipe for such lifting of the water, a set of pipes for conveying water to the dishes to be washed, two cage like stands for supporting the dishes to be washed, inlet pipe for filling the water tank with water, drainage pipe for draining the dirty water, sieve/net/filter for filtering the dirty water before it is recycled, solenoid valves for regulating the flow of water through the inlet and the drainage pipes, timing devices, **improved means** for distributing the water/water soap solution to the dishes and **improved means** for scrubbing the bigger bowls in which food has been cooked.

2.A dishwasher as claimed in claim (1) wherein the smaller steel body is contained in the bigger steel body..

3.A dish-washer as claimed in claims 1 and 2 wherein the bases of the smaller steel body and the bigger steel body are joined together so that the smaller steel body and the bigger steel body together make one unit.

4.A dish-washer as claimed in claim 1, 2 and 3 wherein the smaller steel body has a false base to reduce the volume of the lower portion of this unit.

5.A dish-washer as claimed in claim 1, 2, 3 and 4 wherein the lower portion of this unit serves as a water tank.

6.A dish-washer as claimed in claim 1 to 5 wherein there are slits/cuts/holes in the lower portion of the smaller steel body so that water can move from the bigger body into the smaller body and vice-versa.

7.A dish-washer as claimed in claim 1 wherein the water pump is mounted on a stand with wheels.

8.A dish-washer as claimed in claim 1 and 7 wherein the said stand with wheels is connected through strings to a pulley on one side (left or right side) and the pulley of a slow moving motor on the other side (left or right side) and placed on top of the smaller body.

9.A dish-washer as claimed in claim 1 and 8 wherein the said slow moving motor can rotate in both clock-wise and anti clock-wise directions and as it rotates, the stand also moves from left to right and from right to left.

10.A dish-washer as claimed in claim 1 wherein the pipe for lifting water from the water tank is immersed in the water tank below and connected to the inlet of the water pump.

11.A dish-washer as claimed in claim 1 wherein the means of conveying water to the dishes to be washed comprises a set of three pipes having a number of small-small holes which is connected through another pipe to the outlet of the water pump.

12.A dish-washer as claimed in claim 11 wherein the said pipe connected to the outlet of the water pump and the set of three pipes joined to it enters the smaller steel body through a slit in its rear part.

13.A dish-washer as claimed in claim 12 wherein the set of three pipes referred therein are positioned in such a way that the upper stand has a pipe above and a pipe beneath it and the lower stand has a pipe beneath it.

14.A dish-washer as claimed in claim 13 wherein the set of three pipes have small-small holes in such a way that when water gushes out of them with great force and pressure on activation of the water pump, the movement of the jets of water is downwards from pipe number 14, upwards from pipe number 15 and upwards from pipe number 16.

15.A dish-washer as claimed in claim 13 wherein the said set of three pipes are connected to another pipe in such a way that each pipe of the said set of three pipes make an angle of 90 degrees with the said connecting pipe.

16.A dish-washer as claimed in claim 1 wherein the means for supporting dishes to be washed comprises two cage-like stands in the smaller steel body, called the lower stand and the upper stand, as per their respective positions inside the body.

17.A dish-washer as claimed in claim 1 wherein the **improved means** for scrubbing the bigger bowls in which food has been cooked , comprises two shafts which are mounted on thrust bearings on their lower sides and fitted with

scrubbers on their upper sides. Their upper ends rise a little above the upper stand.

18.A dish-washer as claimed in claim 17 wherein the said shafts are connected, through strings, to the pulley of a fast moving motor.

19.A dish-washer as claimed in claims 17 and 18 wherein the bigger bowls used for cooking are kept upside down with scrubbers inside their bodies. When the machine is in operation, the fast moving motor rotates at a high speed and along with it the shafts with attached scrubbers also rotate. This results in thorough scrubbing of the dishes in which food has been cooked.

20.A dish-washer as claimed in claim 19 wherein the said bigger cooking bowls are held in their places firmly by clamps fitted with the upper stand so that when the scrubber is in action, they are not swayed away from their respective places but are held firmly by the said clamps.

21.A dish-washer as claimed in claim 1 wherein just below the lower stand and just above water tank is a very fine net/sieve to filter the water.

22.A dish-washer as claimed in claim 5 wherein the said water tank is fitted with a heater connected to a thermostat to heat the water and keep it at the desired temperature.

23.A dish-washer as claimed in claim 1 wherein the inlet pipe for filling the water tank with water and the drainage pipe for draining the dirty water are connected to solenoid valves.

24.A dish-washer as claimed in claim 1 and 23 wherein the solenoid valves are kept activated till such time, by suitable timing devices, as is necessary to fill the desired quantity of water or to drain it out, and then deactivated

25. The claim is cancelled

26. A dishwasher as claimed in claims 1 and claims 7 to 15 wherein the improved means for distributing the water/water soap solution to the dishes to be washed comprises a **unit** consisting of

a) a water pump (5)

b) a pipe (11) immersed in the water tank and connected to the inlet of the water pump

c) a pipe (13) connected to the outlet of the water pump which, in turn, is joined to a set of three horizontal pipes (14,15,16) having a number of small-small holes, each pipe of the said set of three pipes making an angle of 90 degrees with it.

d) the said set of pipes entering the smaller steel body through a slit in its rear part and positioned in such a way that the upper stand has a pipe (14) above it and a pipe (15) beneath it and the lower stand has a pipe (16) beneath it

e) the said set of three pipes having holes in such a way that when the water pump is activated, jets of water fall downwards from pipe numbered (14), upwards from pipe numbered (15) and upwards from pipe numbered (16),

characterized in that

the said **unit** is mounted on a stand with wheels (6);
the said stand with wheels rests on **top** of the smaller steel body (1),
the said stand with wheels is connected, through strings (7,8) to the pulley of a slow moving motor (10) on one side (left or right side) and a pulley (9) on the other side (left or right side). This motor can rotate in both clock-wise and anti clock-wise directions. And, as it rotates, the said **unit** mounted on the stand with wheels moves from left to right and from right to left. When the unit mounted on the stand with wheels moves from left to right and from right to left, the water distributing pipes also move from left to right and from right to left inside the smaller steel body, thereby coming close to some dishes at a time for some time, spraying concentrated supply of water on them for some time and then moving on to other dishes. This to and fro movement of the water distributing pipes goes on and on till the entire dishes are sprayed with concentrated supply of water and thoroughly cleaned/rinsed.

STATEMENT UNDER ARTICLE 19 (1)

The claims in my International Application No. PCT/IN2005/000113 have been amended so as to make them more explicit.

I feel it pertinent to make a mention about background of the invention which would enable one to have a better understanding of my invention.

BACKGROUND OF THE INVENTION

Although dishwashers are known in the prior art, they suffer from two main defects. First is that the machines take a lot of time to cleanse/wash the dishes. Second is that they are not very efficient in washing the dishes completely, rid them of oil stains and more particularly in absolutely cleaning the dishes in which food has been cooked.

For an efficient washing and cleansing of the dishes, it is important that the entire bodies of the dishes to be washed are sprayed fully with water under pressure. In the known works of art, the objective of spraying water with pressure has been tried to be achieved by transmitting water either through nozzles or through holes in the water distributing pipes in the form of jets of water. The objective of spraying the dishes fully with water has been tried to be achieved by arranging for plurality of water distributing pipes with plurality of jets/nozzles. However, these systems have been only partially successful in achieving the desired results. The reason is that these systems are not successful in covering the **entire volume** of the washing zone with jets of water. Though

there is plurality of jets of water, but since they fly in predetermined directions, they are not successful in covering the entire surface areas of all the dishes equally with jets of water.

Another method employed in the prior art is to arrange for circular movement of the basket containing dishes so that at a given time only some dishes will come in front of the water distribution source and thus receive concentrated supply of water/water soap solution. However, the defects stated above are not removed with this system also.

Yet another alternative may be to bring the water distributing source close to only some dishes at a time so as to spray them with concentrated supply of water for some time, then make the water distributing source move to other dishes and so on and so forth. This system can be devised if the water distributing pump-motor, the pipe connected to the inlet of this pump, the water distributing pipes connected to its outlet are all made movable. As far as I am aware, I am the first in the art to devise such a system, the details of which are described in the Description of the Invention.

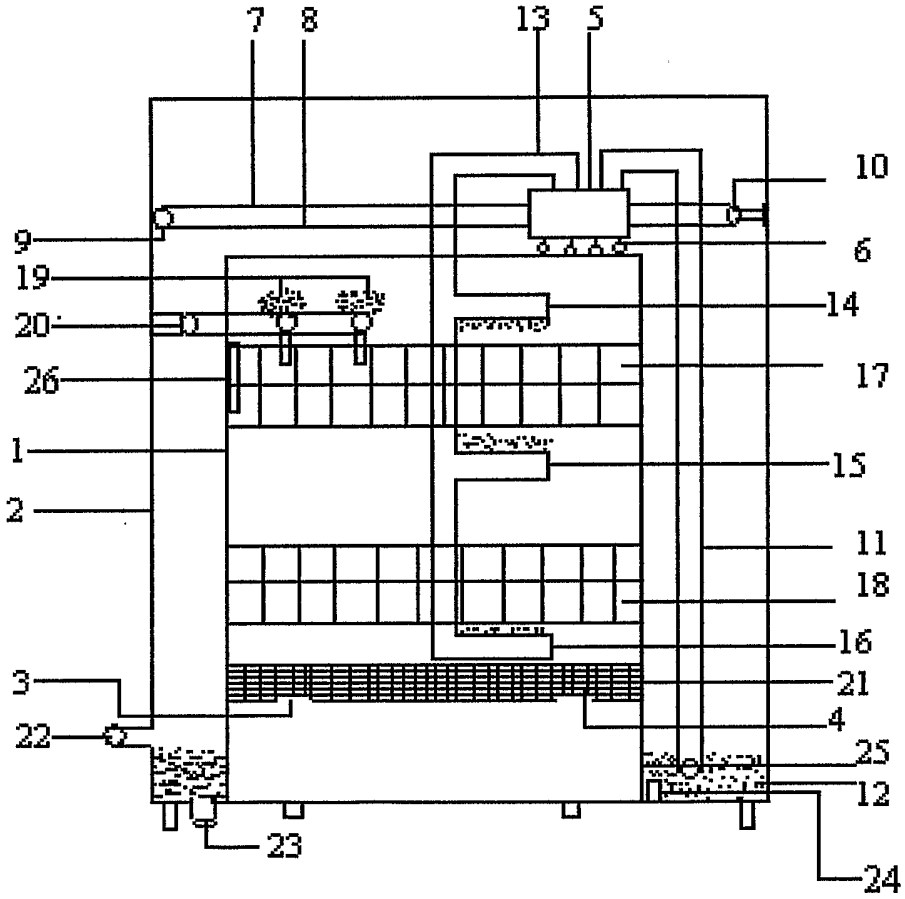

Figure 1

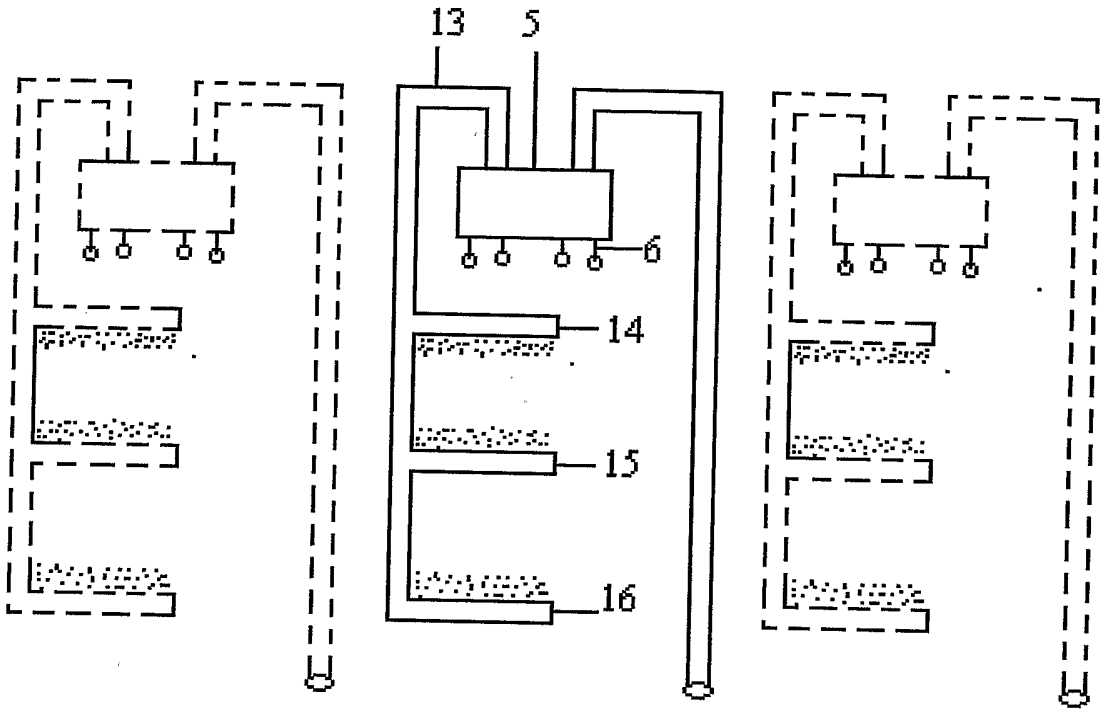

Figure 2

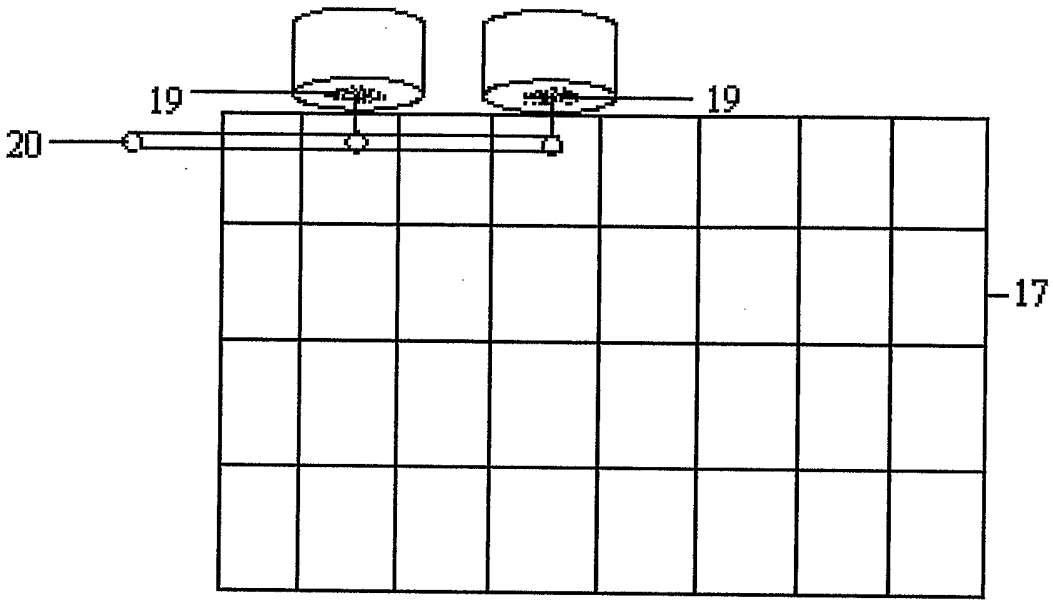

Figure 3

INTERNATIONAL SEARCH REPORT

Int onal Application No
PCT/IN2005/000113

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47L15/08 A47L15/00 A47L15/37 A47L15/39 A47L15/42 A47L15/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A47L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2 342 995 A (BALLENTINE GEORGE K) 29 February 1944 (1944-02-29) page 1, paragraph 3 page 1, paragraph 8 page 2, paragraph 2 page 2, paragraph 6 page 3, paragraph 1; figures 1,2	1-7, 10-25
Y	US 1 971 206 A (ADELMANN HANS) 21 August 1934 (1934-08-21) page 1, line 94 - page 2, line 20; figure 1	1-7, 10-25
Y	DE 44 43 918 A1 (BOSCH-SIEMENS HAUSGERAETE GMBH, 81669 MUENCHEN, DE; BSH BOSCH UND SIEM) 13 June 1996 (1996-06-13) column 5, lines 15-30	1-7, 10-25

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
21 June 2005	01/07/2005

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European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Papadimitriou, S

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International Application No
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