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(54) **Title**: WATER PURIFICATION KETTLE

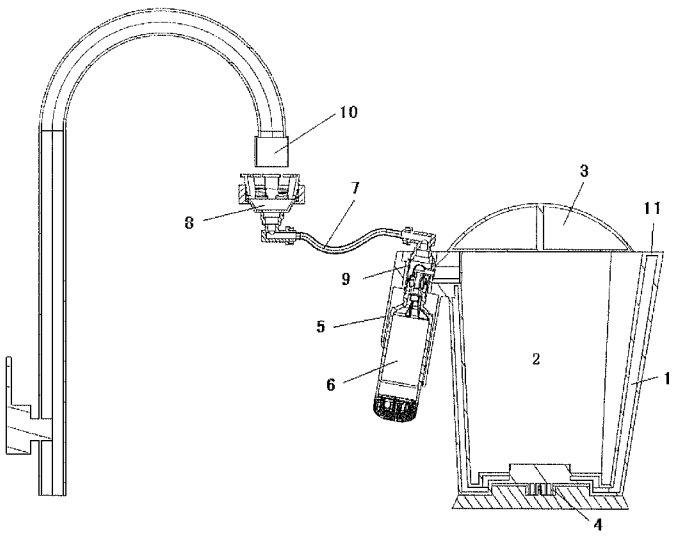

Fig. 1

(57) **Abstract**: Provided is a water purification kettle including a kettle body (1) defining a water storage space (2) therein, a kettle cover (3) arranged in cooperating relation with the kettle body (1), and a spout (11) arranged in fluid communication with the water storage space (2); a handle (5) provided at the kettle body (1); a connector unit (8) adapted to the connectable with faucets (10) in order to receive water from the faucets (10); a filter unit (6) provided inside the handle (5) and arranged in fluid communication with the connector unit (8) with the water storage space (2), wherein water to be heated enters the water storage space (2) after being filtered by the filter unit (6); and a heating unit (4) provided to heat the water to be heated in the water storage space (2).

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WATER PURIFICATION KETTLE

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a field of household utensils, and in particular, to a water purification kettle.

Description of the Related Art

Nowadays, there are three kinds of main water supply devices in the market: a water dispenser, a water purifier, and, a boiling kettle. The water purifier has limited market share because of its high price, while the water dispenser and the kettle have dominating market share owing to their relatively lower prices. However, the water dispenser has a shrinking market due to its inconvenience in usage and sanitary concerns, etc. Also, once a water dispenser is used, the water barrel containing fresh and purified water needs to be replaced frequently. Compared with the water dispenser, the boiling kettle has the following advantages: convenient and quick services, low cost, absolute boiling of the water, and no secondary pollutions. On the other hand, it has the drawbacks such as bad taste, deposition of scale, and the quality of the finished drink water is heavily dependent upon the quality of the tap water. In addition, in certain regions of the world, hot water is more popular than cool water. Only the water purifier combined with an independent heating unit achieves heating functions, however, such water purifier requires high costs and maintenance. Therefore, it is desirable to have a kettle with a purifying capability which will bring forth a fundamental change to the conventional water supply devices.

As one of the common household appliances, kettles (the electric kettle as an example) have the advantages of, for example, low cost and convenient usage. At present, the electric kettle in the market usually comprises a body, a handle connected to the body, a heating cord provided in the bottom of the body, and, a heating unit connectable to a power supply.

However, when in use, the above-mentioned electric kettle encounters the following problems as it does not have the water purification capability. That is, when the source water has bad quality, serious problem of ineffective filtration and purification may occur, as a result, the safety of the water cannot be ensured. For

example, when the water contains certain heavy metal or organic matter therein, it is hard to remove these materials only by boiling. Especially, during the heating, derivants (such as chloroform) may be generated from the chemical reaction between the residual chlorine in the water and the organic acid, which will bring harm to the respiratory system.

In addition, there exists a special water purification kettle product in the market. The water purification kettle product supplies the purified water to the user. However, if hot purified water is required, an additional heating unit is required.

CN 93117838.X (filed August 14, 1993) discloses a filtration kettle, comprising: a first chamber for receiving fluid such as water or other liquid sources therein, a second chamber for receiving the filtered fluid from one inlet therein, and a filter chamber. The fluid flows from the first chamber to the second chamber via the filter chamber.

US20060249442 (filed May 31, 2006) discloses a kettle with filtration capability, wherein, a pipe connectable with a faucet supplies with enough pressured water, and the water enters the storage water tank after passing through the filter disposed inside the kettle. The connection pipe may be retracted into the kettle when the pipe connectable with a faucet is not in connection with the faucet.

WO2000037363 (filed December 16, 1999) discloses a handle kettle with filtration system and storage water tank, the handle kettle may be connected to a water source via a connection mechanism so as to achieve enough water pressure, and, the water enters the storage water tank after passing through a filter disposed in a filter unit.

In order to overcome the above-mentioned problems, people seek to devise an electric kettle with filtration capability by integrating the filtration capability and the heat capability. For example:

CN91215879.4 (filed September 10, 1991) discloses a boiling pot, it comprises a pour spout, a gemel, a pot cover, a pot body, a pot handle, a pot base, a filter cartridge, a magnetizing slice, a mineralizing unit, mineralizing stone, and activated carbon. The water inside the pot can be purified, magnetized, mineralized and heated.

US6178290 (filed October 8, 1999) discloses a water filtration device, it comprises a kettle body with a spout, a handle provided in an opposite direction to the spout, a heating unit mounted at the bottom of the kettle body, and a filtration unit disposed inside a space nearby the kettle body.

However, all the above technical solutions have the following common design: a kettle with a filter unit, wherein the filter unit is disposed inside the kettle. However, such designs put limits on water storage capability of the kettle.

Meanwhile, if a heating function is added, specific protective means (e.g., the addition of the thermal insulating layer) should be adopted since the filtering medium inside the filter has poor tolerance to the hot water.

SUMMARY OF THE INVENTION

Accordingly, the present invention has been made to overcome or alleviate at least one drawback and shortcoming of the structural design and the functional design existing in the prior art.

The present invention provides a water purification kettle.

More particularly, the present invention provides a water purification kettle, which has a larger water storage space compared to the conventional kettle with a filter.

In another aspect, the present invention provides a water purification kettle, which is capable of being connectable to faucets of various sizes to receive water from these faucets.

In another aspect, the present invention provides a water purification kettle, which may be equipped with filter units of different types, in accordance with practical requirements.

In another aspect, the present invention provides a water purification kettle, which may adopt different heating modes, in accordance with practical requirements.

In one embodiment, the present invention provides a water purification kettle comprising:

a kettle body defining a water storage space therein, a kettle cover arranged in cooperating relation with the kettle body, and a spout arranged in fluid communication with the water storage space;

a handle provided at the kettle body;

a connector unit adapted to be connectable with faucets in order to receive water from the faucets;

a filter unit provided at least partially inside inside the handle and in fluid communication with the connector unit and with the water storage space, wherein water to be heated enters the water storage space after being filtered by the filter unit; and

a heating unit provided to heat the water to be heated in the water storage space.

In a more specific aspect, the connector unit comprises: an opening adapted to be connectable to the faucets in order to receive water from the faucets; and an opening adjustment mechanism adapted for adjusting the diameter of the

opening in order to suitably mate the opening with faucets of different sizes.

In another aspect, the opening adjustment mechanism may comprise: a plurality of inner adjusting members arranged around the opening at intervals in an outward and upward radial manner along an axial direction of the opening; an outer adjusting member arranged to surround and engage with the plurality of inner adjusting members to adjust the diameter of the opening; wherein, when the outer adjusting member moves upwardly along the axial direction of the opening, the plurality of inner adjusting members are tightened to contract or reduce the size of the opening so as to achieve a secure connection between the opening and the faucet; when the outer adjusting member moves downwardly along the axial direction of the opening, the plurality of inner adjusting members are loosed to expand the opening so as to release connection between the opening and the faucet.

In another aspect, the opening adjustment mechanism may further comprise first and second threaded portions engaged with each other, wherein the first threaded portion is disposed at the outside of the plurality of inner adjusting members while the second threaded portion is disposed at the inside of the outer adjusting member, the first and second threaded portions are engaged with each other in order to achieve movement between the plurality of inner adjusting members and the outer adjusting members.

According to an embodiment of the present invention, the connector unit may further comprise: a hermetically-sealed structure adapted for achieving hermetically-sealed connection between the opening and the faucet.

According to another embodiment of the present invention, the hermetically-sealed structure may comprise a plurality of sealing gaskets provided inwardly and respectively at the plurality of inner adjusting members arranged around the opening in order to seal the connection between the opening and the faucet. Preferably, the sealing gaskets are made of soft material. For example, the soft material is one of silica gel, acrylonitrile butadiene rubber, and fluorine rubber.

According to another embodiment of the present invention, the hermetically-sealed structure may comprise a retractable sealing sleeve provided inwardly at the plurality of inner adjusting members arranged around the opening in order to seal the connection between the opening and the faucet. Preferably, the sealing gaskets are made of soft material. For example, the soft material is one of silica gel, acrylonitrile butadiene rubber, and fluorine rubber. Furthermore, the retractable sealing sleeve may further comprise a sealing portion elastically attachable to the faucet in order to further seal the connection between the opening and the faucet.

According to the present invention, the connector unit may further comprise a flexible tube connected to the opening and adapted for the delivery of the water.

Further, the water purification kettle further may comprise a connection mechanism provided at the handle, wherein the connector unit is connected with the filter unit by the connection mechanism.

According to one embodiment of the present invention, the filter unit may be connected with the connection mechanism by snap locking.

According to one aspect of the present invention, the filter unit may be replaceable.

According to one embodiment of the present invention, the handle may be provided in an opposite direction to the spout.

According to the present invention, the heating unit is configured to be an internal heating unit disposed at the bottom of the kettle body. Alternatively, the heating unit may be configured to be an external heating unit.

As apparent from the above, the certain embodiments of the present invention may have the following advantages:

the filter unit is disposed inside the handle so as to have a larger water storage space compared to the conventional kettle with a filter. The kettle according to the present invention isolates the filter unit from the kettle body, the heating member and the heated water, so as to prevent the hot vapour from being directly contacted with the filter unit to affect the filtering effect and service life. Further, with the help of the connector unit, the kettle according to the present invention may be directly connected to the faucets of different sizes to receive water from the faucets. In addition, the kettle according to the present invention may choose different filter units in accordance with different filtering demands. Furthermore, the kettle according to the present invention may adopt different heating modes, in accordance with practical requirements.

BRIEF DESCRIPTION OF THE DRAWINGS

These and/or other aspects and advantages of the invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:

Fig. 1 is an application schematic view of the water purification kettle according to one preferred embodiment of the present invention, in which the kettle is shown in a cross-sectional manner;

Fig. 2 is a schematic view of the water purification kettle according to one preferred embodiment of the present invention;

Fig. 3 is a schematic view of a connector unit adopted in the water purification kettle according to one preferred embodiment of the present invention; and

Fig. 4 is a schematic view of a connector unit adopted in the water purification kettle according to another preferred embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE IVENTION

Exemplary embodiments of the present disclosure will be described hereinafter in detail with reference to the attached drawings, wherein the like reference numerals refer to the like elements. The present disclosure, however, should not be construed as being limited to the embodiment set forth herein; rather, these embodiments are provided so that the present disclosure will be thorough and complete, and will fully convey the concept of the disclosure to those skilled in the art.

First of all, please refer to Fig. 1 and Fig. 2, the present invention provides a water purification kettle. More specifically, Fig. 1 is a cross-sectional schematic view of the water purification kettle according to one preferred embodiment of the present invention; and, Fig. 2 is a schematic view of the water purification kettle according to one preferred embodiment of the present invention.

A water purification kettle comprises: a kettle body 1 defining a water storage space 2 therein, a kettle cover 3 arranged in cooperating relation with the kettle body 1, and a spout 11 interconnected with the water storage space 2; a handle 5 provided at the kettle body 1; a connector unit 8 adapted to be connectable with faucets 10 of different sizes to receive water from the faucets 10; a filter unit 6 provided at least partially inside inside the handle 5 and interconnected with the connector unit 8 and with the water storage space 2, wherein water to be heated enters the water storage space 2 after being filtered by the filter unit 6; and a heating unit 4 provided to heat the water to be heated in the water storage space 2. Specifically, according to one preferred embodiment of the present invention, as shown in Fig. 1 and Fig. 2, the kettle body 1 has preferably a cylindrical shape, the kettle cover 3 is preferably hinged in the kettle body 1, and, preferably, the handle 5 is provided in an opposite direction to the spout 11. By disposing the filter unit inside the handle, the water purification kettle according to one preferred embodiment of the present invention has a larger water storage space compared to the conventional kettle with a filter.

According to the present invention, as shown in Fig. 3, the connector unit 8

comprises an opening 80 and an opening adjustment mechanism 81. The opening 80 is adapted to be connectable to the faucets 10 in order to receive water from the faucets 10; and, the opening adjustment mechanism 81 is adapted for adjusting diameter of the opening 80 in order to suitably mate the opening 80 with the faucets 10 of different sizes. Since the diameter of the opening 80 may be adjusted by the opening adjustment mechanism 81, the connector unit 8 may be connected directly with the faucets of different sizes.

Particularly, as shown in Fig. 3, the opening adjustment mechanism 81 comprises a plurality of inner adjusting members 13A and an outer adjusting member 12. The plurality of inner adjusting members 13A are arranged around the opening 80 at intervals, in an outward and upward radial manner along an axial direction of the opening 80; while, the outer adjusting member 12 is arranged to surround and engage with the plurality of inner adjusting members 13A to adjust the diameter of the opening 80; wherein, when the outer adjusting member 12 moves upwardly along the axial direction of the opening 80, the plurality of inner adjusting members 13A are tightened to contract the opening 80 so as to achieve the connection between the opening 80 and the faucet 10; while, when the outer adjusting member 12 moves downwardly along the axial direction of the opening 80, the plurality of inner adjusting members 13A are loosed to expand the opening 80 so as to release the connection between the opening 80 and the faucet 10. Preferably, the above-mentioned inner adjusting members 13A are elongated supporters arranged around the opening 80 at intervals, in an outward and upward radial manner along an axial direction of the opening 80. The outer adjusting member 12 preferably is an external annular sleeve disposed outside these elongated supporters. That is to say, according to the present invention, the diameter of the opening may be variable by means of the engagement between the inner adjusting members 13A and the outer adjusting member 12, such that it may be suitably and directly connected to the faucets of different sizes to receive water from the faucets.

Further, in order to consolidate the diameter adjustment to the opening by means of the opening adjustment mechanism 81, according to the present invention, as shown in Fig. 3, the opening adjustment mechanism 81 further comprises: first and second threaded portions 15, 14 engaged with each other, wherein the first threaded portion 15 is disposed at the outside of the plurality of inner adjusting members 13A while the second threaded portion 14 is disposed at the inside of the outer adjusting member 12, the first and second threaded portions 15, 14 are engaged with each other in order to achieve the movement between the plurality of inner adjusting members 13A and the outer adjusting members 12.

According to the present invention, the connector unit 8 further comprises:

a hermetically-sealed structure adapted for achieving hermetically-sealed connection between the opening and the faucet.

According to one embodiment of the present invention, as shown in Fig. 3, the hermetically-sealed structure comprises a plurality of sealing gaskets 13 provided inwardly and respectively at the plurality of inner adjusting members 13A arranged around the opening 80 in order to seal the connection between the opening 80 and the faucet 10. Preferably, the sealing gaskets 13 are made of soft material. For example, preferably, the soft material of which the sealing gaskets 13 are made is one of silica gel, acrylonitrile butadiene rubber, and fluorine rubber. More preferably, the sealing gaskets 13 are made of silica gel. When the opening 80 and the faucet 10 are connected with each other by means of, for example, the engagement between the first and second threaded portions 15, 14, the above-mentioned sealing gaskets 13 may be tightened to contract the opening 80 so as to achieve the connection between the opening 80 and the faucet 10.

According to another embodiment of the present invention, as shown in Fig. 4, the hermetically-sealed structure comprises a retractable sealing sleeve 16 provided inwardly at the plurality of inner adjusting members 13A arranged around the opening 80 in order to seal the connection between the opening 80 and the faucet 10. Preferably, the retractable sealing sleeve 16 further comprises a sealing portion 16A elastically attachable to the faucet 10 in order to further seal the connection between the opening 80 and the faucet 10. Preferably, the retractable sealing sleeve 16 is made of soft material. For example, preferably, the soft material of which the retractable sealing sleeve 16 is made is one of silica gel, acrylonitrile butadiene rubber, and fluorine rubber. More preferably, the retractable sealing sleeve 16 is made of silica gel. When the opening 80 and the faucet 10 are connected with each other by means of, for example, the physical characteristics of the retractable sealing sleeve 16, the retractable sealing sleeve 16 may be enwrapped over the faucet 10 while the sealing portion 16A is enwrapped outside the faucet 10 to achieve the sealing.

According to the present invention, as shown in Fig. 1, the connector unit 8 further comprises a flexible tube 7 connected to the opening 80 and adapted for the delivery of the water. Preferably, the flexible tube 7 may be made of soft materials such as silica gel.

According to the present invention, the kettle further comprises a connection mechanism 9 provided at the handle 5, wherein the connector unit 8 is connected with the filter unit 6 by the connection mechanism 9. The filter unit 6 is connected with the connection mechanism 9 by locking. In one embodiment, the locking may be achieved by adopting the method disclosed in U.S. Patent No.

6,458,269 (Bassett, et. al).

In the illustrated embodiment, the filter unit 6 is replaceable. In the kettle according to the present invention, there is a structure design in which both the filter unit 6 (the filter assembly) and the heating unit 4 and water to be heated in the water storage space 2 are separated from each other such that the filter unit 6 (the filter assembly) will not be affected by the heat energy. In this way, the filter materials may have a stable function and satisfactory service life. In addition, in order to filter the unwanted matters like residual chlorine, organic matter, and heavy metal, the filter unit 6 (the filter assembly) of different types may be adopted.

According to the present invention, the heating unit 4 is configured to be an internal heating unit disposed at the bottom of the kettle body 1. Alternatively, the heating unit 4 is configured to be an external heating unit, such as a gas furnace or electrical hot plate or external energy source like induction field.

Although several exemplary embodiments have been shown and described, it would be appreciated by those skilled in the art that various changes or modifications may be made in these embodiments without departing from the principles and spirit of the disclosure, the scope of which is defined in the claims and their equivalents.

What is claimed is,

1. A water purification kettle, comprising:

a kettle body (1) defining a water storage space (2) therein, a kettle cover (3) arranged in cooperating relation with said kettle body (1), and a spout (11) arranged in fluid communication with said water storage space (2);

a handle (5) provided at said kettle body (1);

a connector unit (8) adapted to be connectable with faucets (10) in order to receive water from the faucets (10);

a filter unit (6) provided at least partially inside said handle (5) and intercommunicated said connector unit (8) with said water storage space (2), wherein water to be heated enters said water storage space (2) after being filtered by said filter unit (6); and

a heating unit (4) provided to heat the water to be heated in said water storage space (2).

2. The water purification kettle according to claim 1, wherein said connector unit (8) comprises:

an opening (80) adapted to be connectable to the faucets (10) in order to receive water from the faucets (10); and

an opening adjustment mechanism (81) adapted for adjusting the diameter of said opening (80) in order to suitably mate said opening (80) with the faucets (10) of different sizes.

3. The water purification kettle according to claim 2, said opening adjustment mechanism (81) comprising:

a plurality of inner adjusting members (13A) arranged around said opening (80) at intervals in an outward and upward radial manner along an axial direction of said opening (80);

an outer adjusting member (12) arranged to surround and engage with said plurality of inner adjusting members (13A) to adjust the diameter of said opening (80);

wherein, when said outer adjusting member moves upwardly along the axial direction of said opening, said plurality of inner adjusting members are tightened to contract the opening so as to achieve the connection between said opening and said faucet; while, when said outer adjusting member moves downwardly along the axial direction of said opening, said plurality of inner adjusting members are loosed to expand the opening so as to release the connection between

said opening and said faucet.

4. The water purification kettle according to claim 3, wherein said opening adjustment mechanism (81) further comprises first and second threaded portions (14, 15) engaged with each other, wherein said first threaded portion is disposed at the outside of said plurality of inner adjusting members while said second threaded portion is disposed at the inside of said outer adjusting member, said first and second threaded portions are engaged with each other in order to achieve the movement between said plurality of inner adjusting members and said outer adjusting members.

5. The water purification kettle according to claim 1, wherein said connector unit (8) further comprises:

a hermetically-sealed structure adapted for achieving hermetically-sealed connection between said opening and said faucet.

6. The water purification kettle according to claim 5, wherein said hermetically-sealed structure comprises a plurality of sealing gaskets (13) provided inwardly and respectively at said plurality of inner adjusting members arranged around said opening in order to seal the connection between said opening and said faucet.

7. The water purification kettle according to claim 5, wherein said hermetically-sealed structure comprises a retractable sealing sleeve (16) provided inwardly at said plurality of inner adjusting members arranged around said opening in order to seal the connection between said opening and said faucet.

8. The water purification kettle according to claim 7, wherein said retractable sealing sleeve (16) further comprises a sealing portion (16A) elastically attachable to said faucet in order to further seal the connection between said opening and said faucet.

9. The water purification kettle according to claim 6, wherein said sealing gaskets (13) are made of soft material.

10. The water purification kettle according to claim 7, wherein said retractable sealing sleeve (16) is made of soft material.

11. The water purification kettle according to claim 9 or 10, wherein said soft material is one of silica gel, acrylonitrile butadiene rubber, and fluorine rubber.

12. The water purification kettle according to claim 1, wherein said connector unit (8) further comprises a flexible tube (7) connected to said opening (80) and adapted for the delivery of the water.

13. The water purification kettle according to claim 1, further comprising a connection mechanism (9) provided at said handle (5), wherein said connector unit (8) is connected with said filter unit (6) by said connection mechanism (9).

14. The water purification kettle according to claim 1, wherein said filter unit (6) is connected with said connection mechanism (9) by locking.

15. The water purification kettle according to claim 1, wherein said filter unit (6) is replaceable.

16. The water purification kettle according to claim 1, wherein said handle (5) is provided in an opposite direction to said spout (11).

17. The water purification kettle according to claim 1, wherein said heating unit (4) is configured to be an internal heating unit disposed at the bottom of the kettle body (1).

18. The water purification kettle according to claim 1, wherein said heating unit (4) is configured to be an external heating unit.

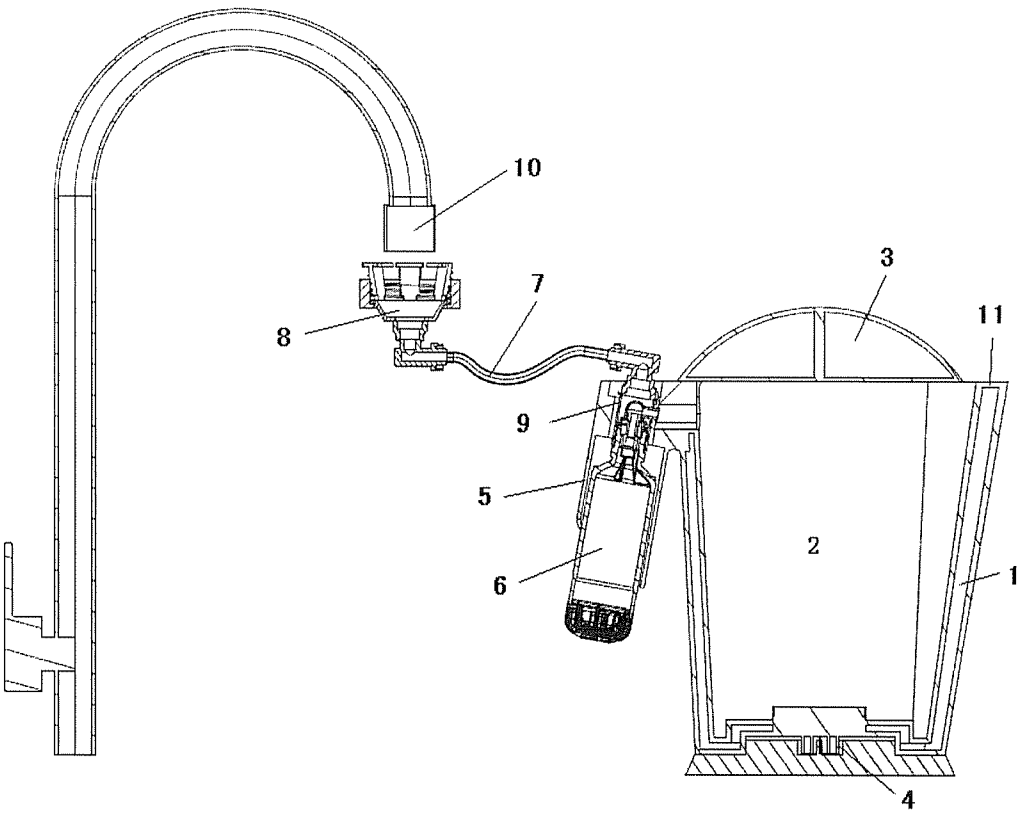

Fig. 1

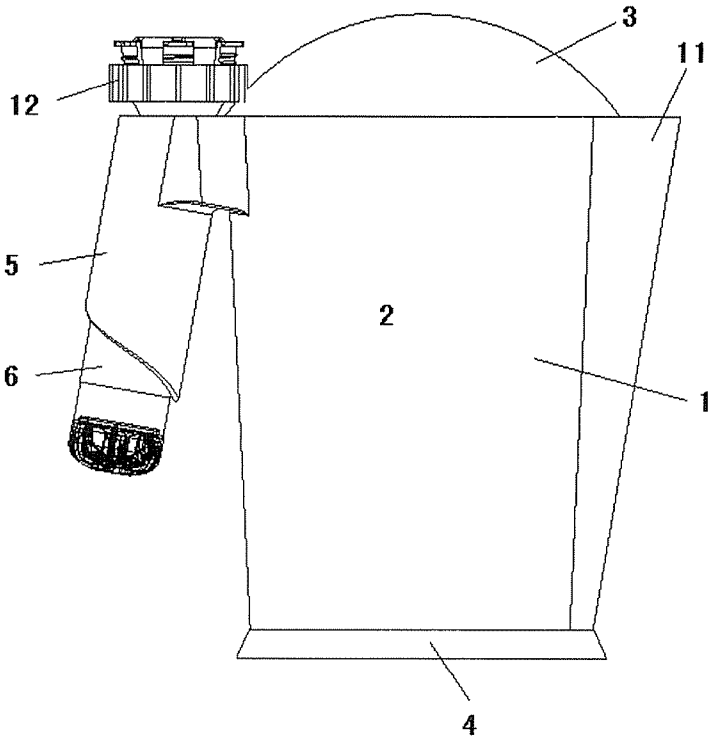

Fig. 2

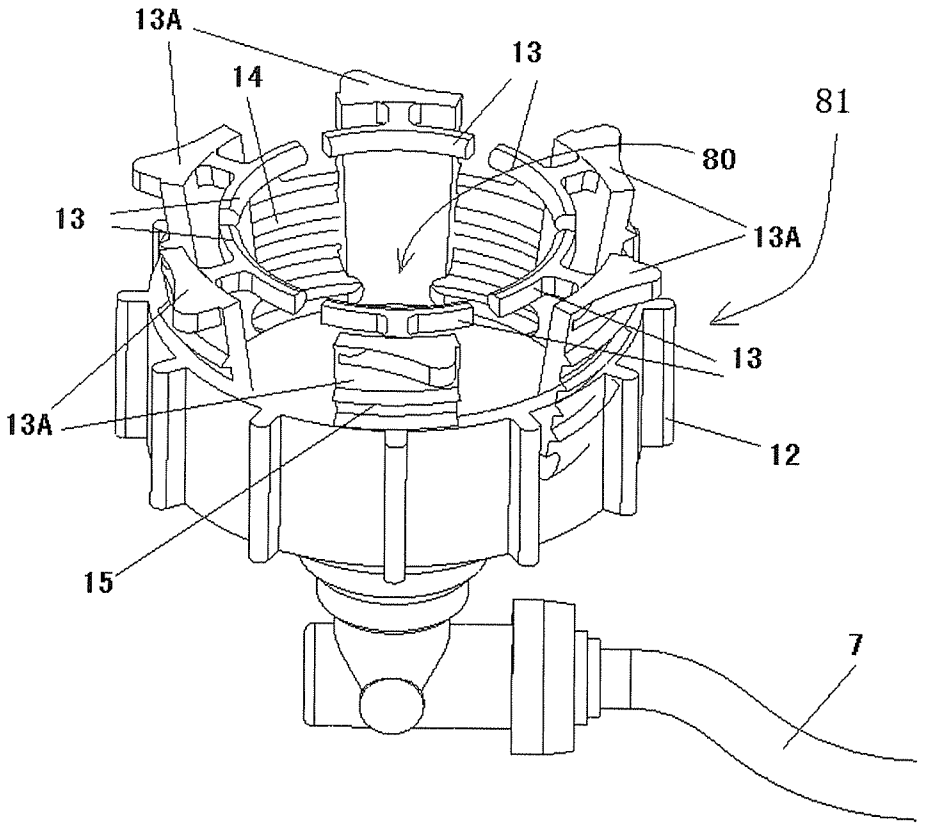

Fig. 3

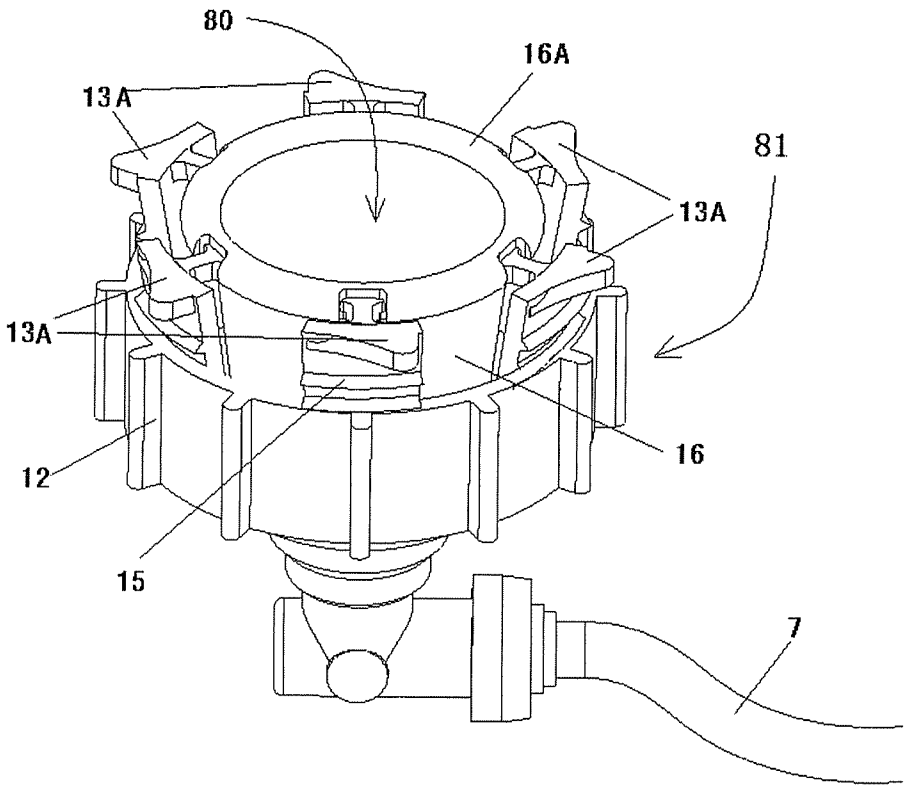

Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2011/075193

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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: C02F, A47J

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 practicable, search terms used)

WPI,EPODOC,CNPAT,CNKI: kettle? or pot? or jug?, filter??? or colation or filtrat???? or screening or lauter, heat??? or reheat???, faucet? or tap? or hydrant? or cock?

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN2218504Y(SHANXING ELECTRIC APPLIANCE IN) 31 Jan. 1996(31.01.1996) Whole document	1-18
A	CN2590502Y(SONG, Zhiming)10 Dec. 2003(10.12.2003) Whole document	1-18
A	CN201085479Y(GUANGDONG XINBAO ELECTRIC APPARTUS LTD S)16 Jul. 2008 (16.07.2008) Whole document	1-18
A	CN201279055Y(XU, Xixing)29 Jul. 2009(29.07.2009) Whole document	1-18
A	EP0897686A1(WOODFIELD ENTERPRISES LTD)24 Feb. 1999(24.02.1999) Claims 1-7 and fig. 1	1-18

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 Feb. 2012(23.02.2012)	**15 Mar. 2012 (15.03.2012)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer SUN, Zhenjun Telephone No. (86-10)62084953

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2011/075193

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
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A. CLASSIFICATION OF SUBJECT MATTER

C02F 1/02 (2006.01) i

A47J 27/21 (2006.01) i