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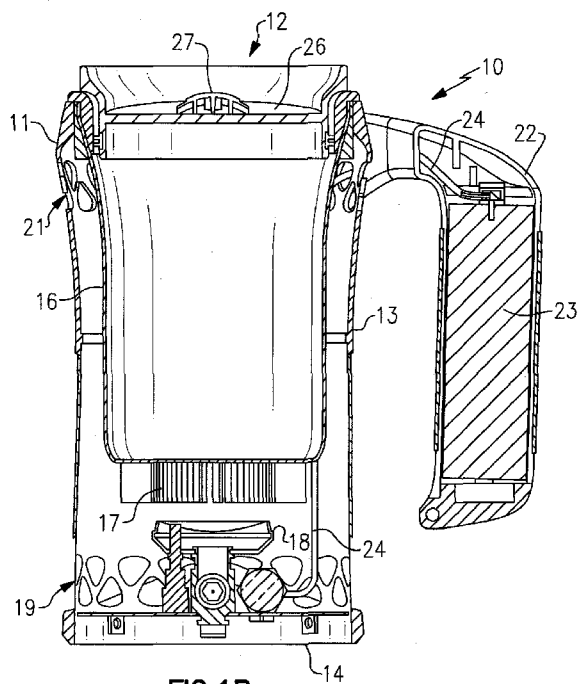
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[Continued on next page]

(54) Title: SELF-HEATING MUG



(57) Abstract: A drinking mug is provided with the vessel for receiving a liquid therein, with the lower portion of the mug having a heating element disposed therein, and with fuel to the heater being contained within and piped from, the handle of the mug. Various devices are provided in the upper portion of the mug for containing a flavoring material to be mixed with hot liquid below to provide flavored hot drinks.

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## Self-Heating Mug

### Cross Reference To Related Application

[0001] This application claims priority to U.S. Provisional Patent Application Serial No. 61/139,865 entitled "Self-Heating Mug," filed on December 22, 2008. The content of this application is incorporated herein by reference in its entirety.

### Technical Field

[0002] This invention relates generally to heating utensils and, more particularly, to utensils with a self-contained heating element therein.

### Background of the Invention

[0003] For the purpose of participating in or observing outdoor activities such as hiking, camping, walking, jogging, or other sports activities, it is often desirable to occasionally have a liquid refreshment and preferably a hot liquid refreshment such as coffee, hot chocolate or the like. One approach to accomplish this is to carry a premade drink in a thermos that tends to keep it hot. However, after several hours, such a hot drink tends to become stale and tends to cool off.

[0004] There is therefore a need for an apparatus/method by which a portable device may be used to easily and effectively prepare a fresh hot drink for consumption by the user.

### Disclosure of the Invention

[0005] Briefly, in accordance with one aspect of the invention, a drinking mug is provided with a vessel for receiving a liquid therein, with the lower portion of the mug having a heating element disposed therein, and with fuel to the heater being contained within, and piped from, the handle of the mug.

[0006] In accordance with another aspect of the invention, various devices are provided in the upper portion of the mug for containing and preparing/brewing flavored hot drinks.

**Brief Description of the Drawings**

- [0007] FIG. 1A is a front elevation view of the mug in accordance with the present invention.
- [0008] FIG. 1B is a sectional view thereof.
- [0009] FIG. 1C is a perspective view thereof.
- [0010] FIG. 1D is a top view thereof.
- [0011] FIG. 2 is a cut-away view thereof with an internal insert in accordance with one aspect of the invention.
- [0012] FIG. 3 is a cut-away view of an alternative internal insert in accordance with another aspect of the invention.
- [0013] FIGS. 4A and 4B show perspective views of a throw-away, liquid containing pouch that can be used with the present invention.
- [0014] FIG. 4C is a perspective view of a container and lid that can be used with the pouch in accordance with the present invention.
- [0015] FIGS. 5A and 5B are sectional view of an extract containing pump that can be used with the mug in accordance with the present invention.
- [0016] FIG. 5C is a cut-away view of the pump as installed in the mug of the present invention.

**Detailed Description of the Invention**

- [0017] The invention is shown generally at 10 as comprising a mug body 11 having a top 12, sides 13 and bottom 14.
- [0018] As will be seen in Fig. 1B, a vessel 16 is provided in the upper portion of the body 11 for containing a liquid to be heated. Attached to the bottom surface of the vessel 16 is a heat conduction element 17 which performs the function of effectively transferring the heat from a burner to the vessel 16 in a manner more fully described in US Patent Application No.: 10/603,947, assigned to the assignee of the present invention and incorporated herein by reference.
- [0019] Disposed in a lower portion of the body 11 is a self-contained burner 18 which operates from a liquid or gaseous fuel that is supplied in a manner to be described hereinafter. The burner 18 may also include an igniter for providing a spark to promote an initial ignition. As will be seen, a plurality of openings 19 are

provided near the bottom 14 for purposes of providing combustion air to the burner 18, and a plurality of openings 21 are provided near the top 12 for the escape of combustion gases from the mug body 11.

**[0020]** An outwardly and downwardly extending handle 22 is attached to the sides 13 of the body as shown and is used for both handling the mug and for containing the fuel for the burner 18. The handle 22 includes an internal reservoir 23 and a tube 24 leading from the reservoir 23 to the burner 18 as shown in Fig. 1B. Provision is made for refilling the reservoir 23 as necessary.

**[0021]** At the top 12 of the mug body 11 is a lid 26 that is used to cover the upper opening of the vessel 16. The lid 26 includes a slider element 27 which may be selectively moved to an open or closed position for the purpose of containing or, alternatively, drinking from the vessel 16.

**[0022]** The above described mug is designed for use in containing a liquid, such as water, that can be selectively heated at a time selected by the user. The mug is also designed to receive various types of fixtures within the vessel 16 in order to prepare/brew a flavored drink as desired by the user. The fixtures as shown in Fig. 2 are one embodiment of such adaptation that can be used for the purpose of preparing percolated coffee, for example.

**[0023]** Similar to a common percolator, an upstanding tube 28 with a percolator funnel 29 at its lower end is temporarily installed as shown. A percolator basket 31 is placed over the top portion of the tube 28. The percolator basket includes a perforated top portion 32 and a perforated bottom portion 33 as shown. The basket is adapted to temporarily receive and hold granules of a flavoring mixture 34, such as coffee granules, for example. A lid 36 with a see-thru-cap 37 may be provided so as enable the user to follow the progression of the percolation process.

**[0024]** In operation, as the water in the vessel 16 is heated, it boils up through the funnel 29 and the tube 28 to flow over the percolator basket 31, tending to flow first through the top portion 32, then through the granules 34, and then through the basket bottom portion 33, after which it mixes with the water in the vessel 16. As the percolation progresses, the mixture of water and flavored drink becomes more concentrated until the color at the see-thru-cap indicates that the

process is finished. The burner is then shut off and the user can either pour the finished drink into a container to be drunk or remove the brewing apparatus from the utensil 16 and drink the mixture directly from the mug 11.

**[0025]** An alternative embodiment of a fixture is shown in Fig. 3 for accommodating a different process of brewing. Rather than a percolation process, the apparatus is adapted to prepare espresso, for example. Here, a funnel shaped element 38 is provided with its bowl portion 39 mounted in the upper portion of the vessel 16 and with its depending tube portion 41 extending down near the bottom of the vessel 16. A filter packet 42 containing coffee granules 43 is then inserted into the bottom of the bowl portion 39 as shown. A cover 44 with an upstanding tube 46 is then secured to the bowl portion 39 as shown. A lid 47 with a pressure tight seal 48 is then secured to the top of the vessel 16 as shown.

**[0026]** In operation, the water in the bottom portion of the vessel 16 is heated up to the boiling point with the pressure tending to build up in the lower portion of the vessel 16. After reaching a predetermined pressure, the steam is forced up through the tube portion 41, through the filter 42 and the coffee grounds 43, with the mixture then passing up through the upstanding tube 46 to enter the top portion of the vessel 16. The lid 47 can then be removed, and the user can drink the prepared espresso directly from the mug.

**[0027]** Rather than the preparation of percolated coffee or espresso as described hereinabove, it may be desirable to use the mug for the preparation of a hot drink from prepared extracts, which may be either in liquid or powder form. Such an extract may be contained in a throwaway pouch which is shaped and sized so as fit in the top of the vessel. Such a pouch is shown at 49 in Figs. 4A and 4B. A top view is shown at Fig. 4A and bottom view thereof is shown at Fig. 4B.

**[0028]** As will be seen, the pouch 49 has top and bottom sides 51 and 52 initially defining a cavity therebetween for the containment of an extract, i.e. a concentrated form of a flavored drink. The pouch 49 may be comprised of foil or plastic, and the top and bottom side 51 and 52 are joined by a sealed edge 53. On one side of the pouch 49 is a indented portion 54 to accommodate a drinking spout in the mug. On the opposite side, at the bottom 52 of the pouch 49, is a port 56 which can be selectively opened or closed to permit the containment within or the

flow therefrom of the extract. The manner in which this is accomplished will be seen by reference to Fig. 4C. The specially designed lid includes a hinged top portion 58 which, when in the open position, allows the insertion of the pouch into the upper portion of the lid 57. The hinged top portion 58 is then closed over the pouch 49. A slide toggle 59 in the hinged top portion 58 can then be selectively moved in such a way as to dispense extract from the pouch 49, thereby allowing it to drain down into the hot water below to complete the preparation of the drink, which then may be sipped from the opening 61 of the lid 57. The pouch may be designed as a single use pouch in which case the slide cargo could release it by way of puncturing the pouch 49. Alternatively, it may be a multiple use pouch with the toggle being moved in such a manner as to increase the pressure on the top portion of the pouch 49 to squeeze a certain amount of extract from the port 56 at the bottom of the pouch.

**[0029]** Another approach to dispensing of an extract into the mug is shown in Fig. 5A. Here a small container 62 provides a reservoir 63 for containment of a desired extract. A downwardly extending discharge port 64 with a spring loaded check valve 66 is provided. Also, on the other side of the container 62 is a pump cylinder 67 and contained piston 68. As the plunger 69 is raised, the extract is drawn downwardly against the check valve 66 to flow into the cavity 71. Then, as the plunger 69 is depressed, the liquid extract is then caused to flow downwardly against the spring loaded check valve 72 and out the opening 73. To accommodate the up-stroke, a vent 74 is provided in the side of the cylinder 67.

**[0030]** An alternative embodiment is shown in Fig. 5B wherein a discharge port 77 and its associated spring loaded check valve 78 is disposed within the reservoir 79 as shown. A cylinder is on the side of the reservoir 79 and the vent 82 is at the top of cylinder, around the plunger 83.

**[0031]** The extract dispenser is so sized and shaped as to fit in the upper end of the vessel 16 as shown in Fig. 5C. As will be seen, a refill port 84 is located near the center of the unit, the plunger 83 at one side thereof, and a opening for the drinking spout 85 at the other side thereof.

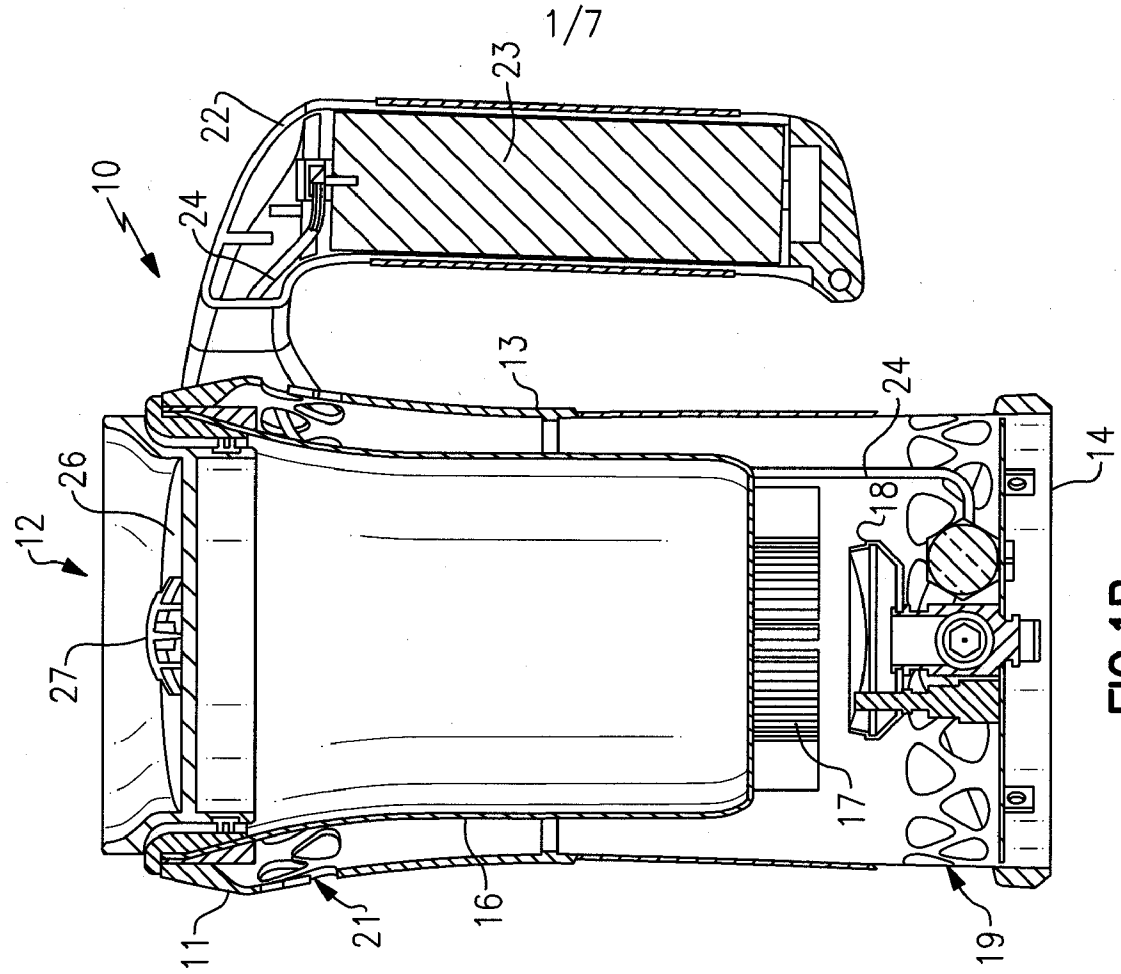
**[0032]** While the present invention has been particularly shown and described with reference to the preferred mode as illustrated in the drawings, it will

be understood by one skilled in the art that various changes in detail may be effected therein without departing from the spirit and scope of the invention as defined by the claims.

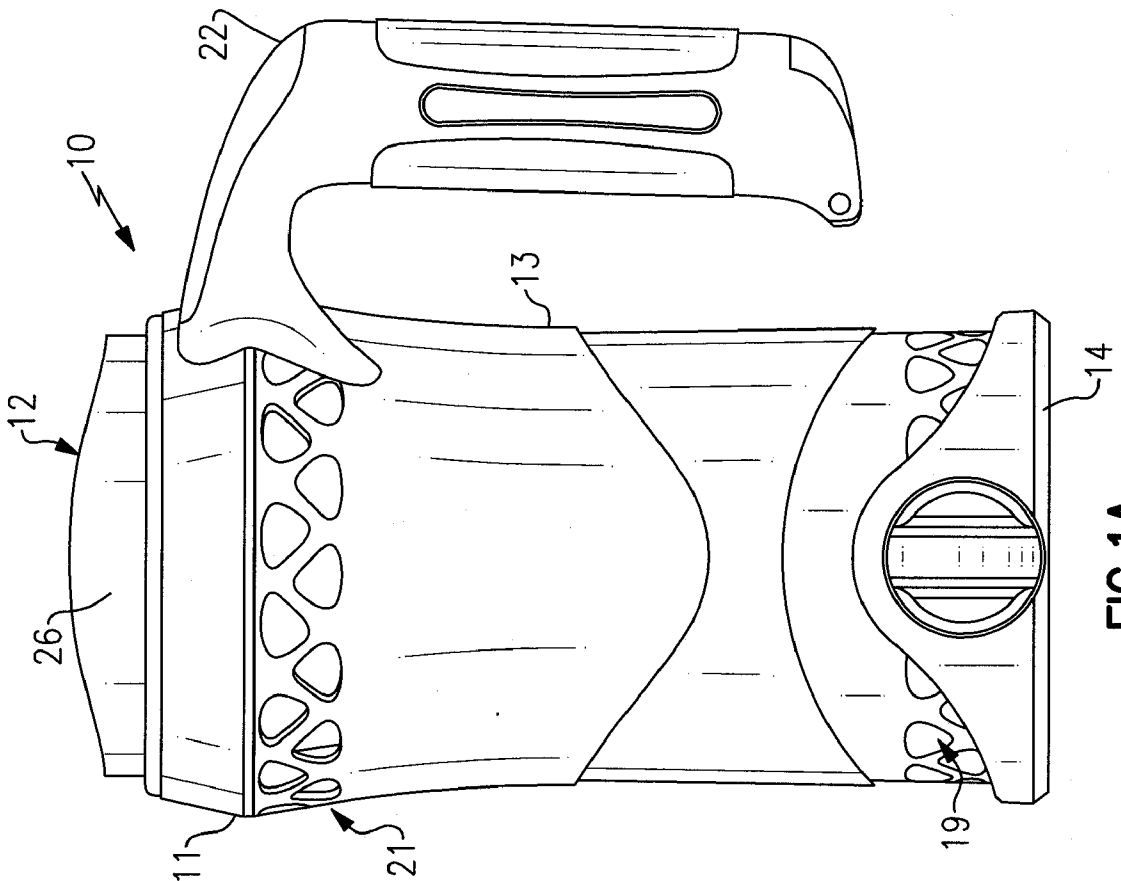


**We Claim:**

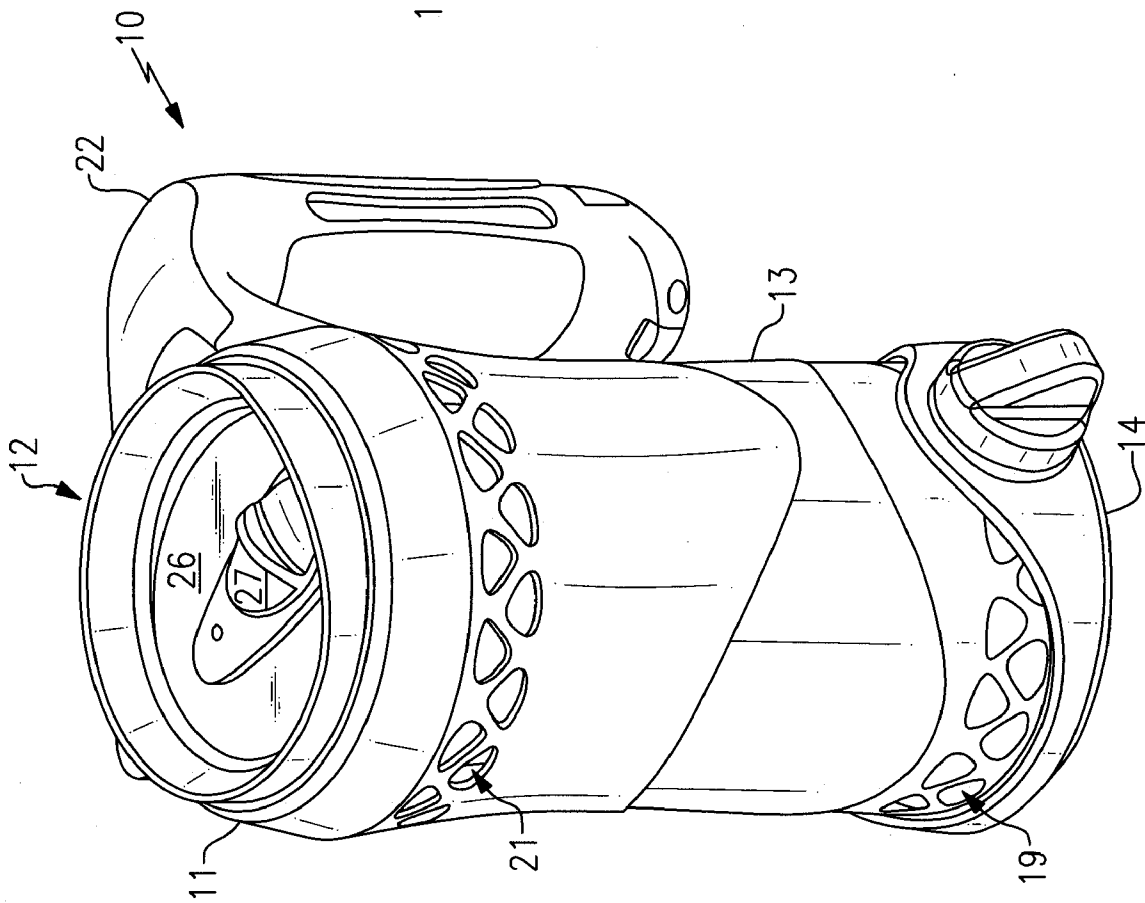
1. A utensil for containing and dispensing of liquid drinks, comprising:
  - a body;
  - a vessel disposed in an upper portion of the body, said vessel having a heat conducting element attached to its bottom surface;
  - a heating element disposed within the bottom portion of said body and adapted to provide heat to said heat conducting element;
  - a handle attached to a side of said body, said handle having a reservoir therein; and
  - a tube interconnecting said reservoir to said burner for providing the flow of fuel to said burner.
  
2. A portable drinking mug comprising:
  - a body;
  - a vessel disposed in an upper portion of the body, said vessel having a heat conducting element attached to its bottom surface;
  - a heating element disposed within the bottom portion of said body and adapted to provide heat to said heat conducting element;
  - a removable insert which is so sized and constructed as to be temporarily disposed in an upper portion of the body, said insert having a cavity for containing a flavored material which is combinable with a liquid to be heated in the vessel below to thereby result in a flavored drink which can be drunk from the mug.



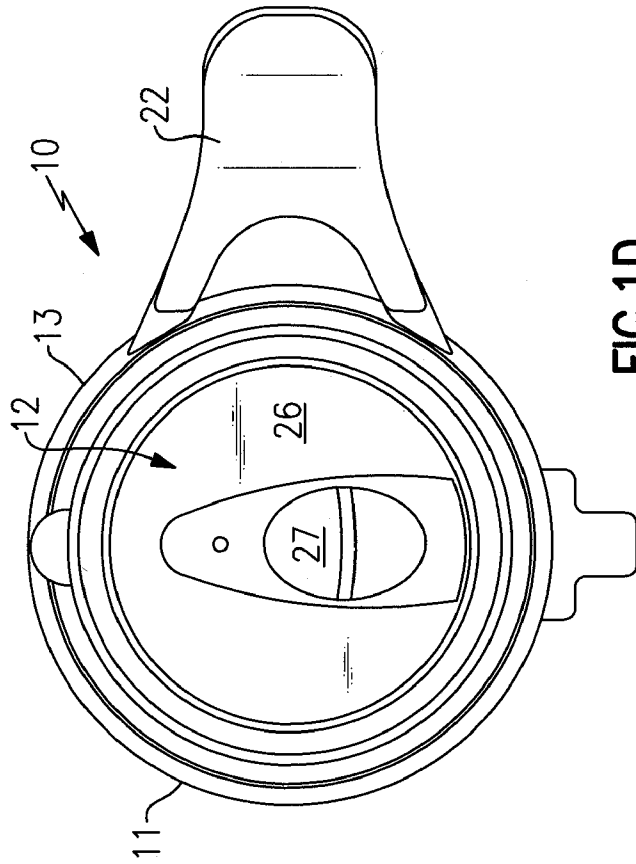
**FIG. 1A**



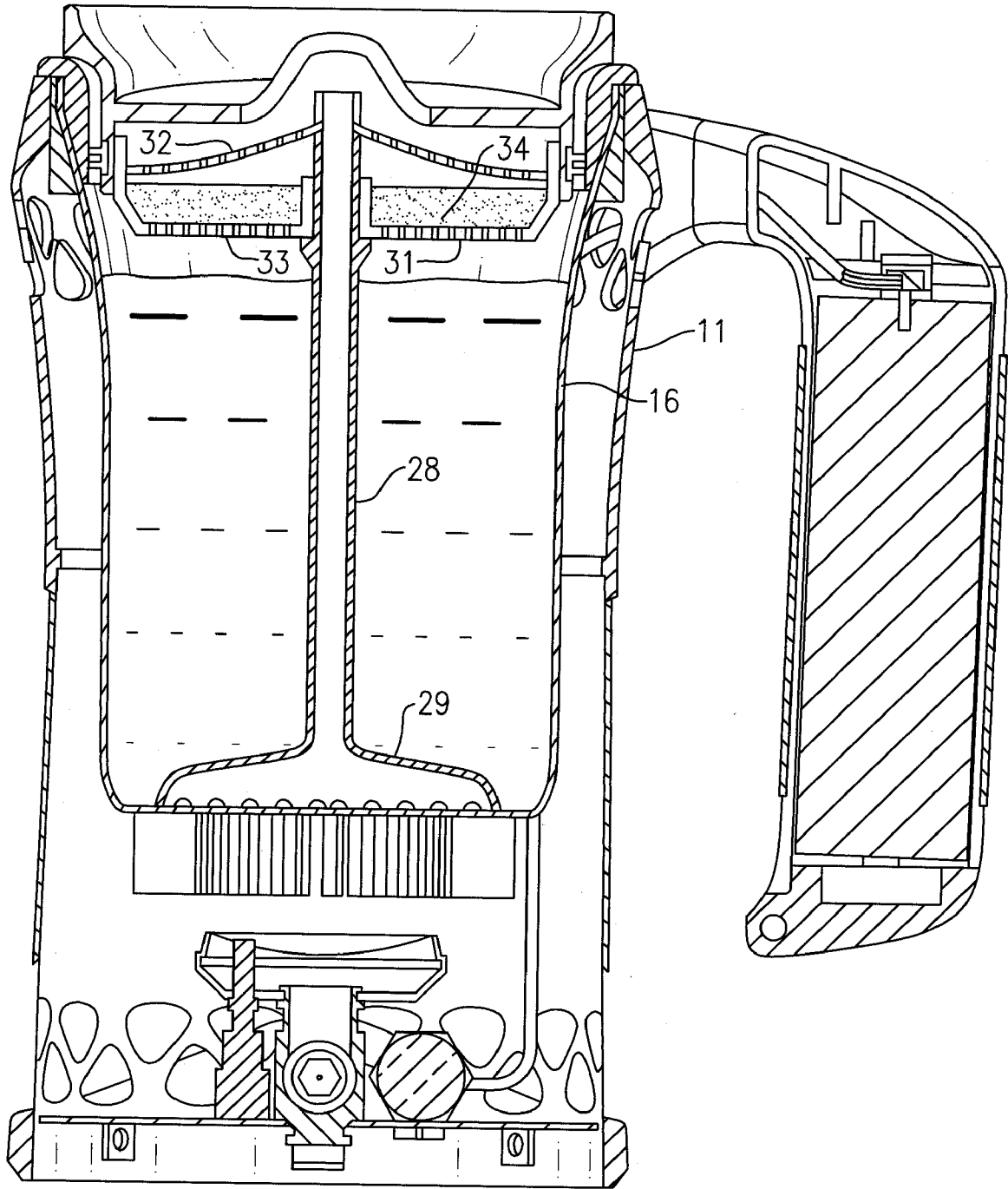
**FIG. 1B**



**FIG. 1C**

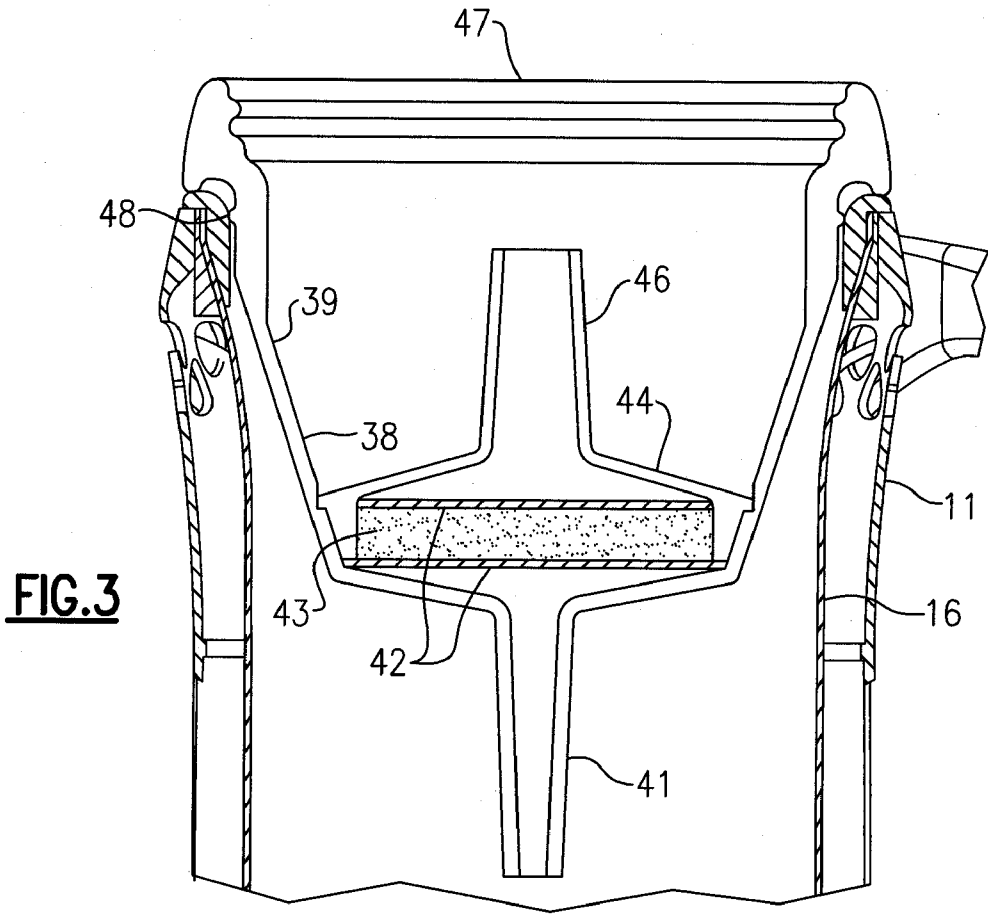


**FIG. 1D**

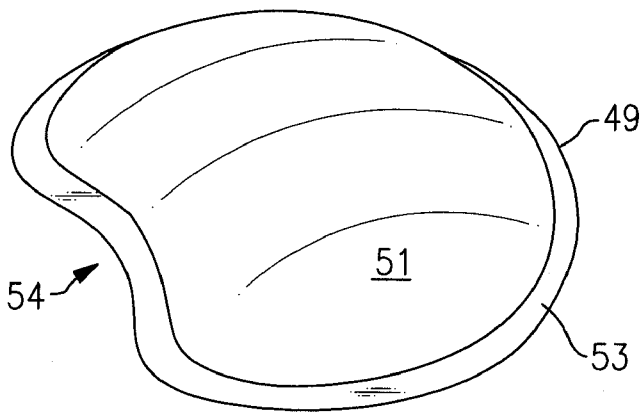


**FIG. 2**

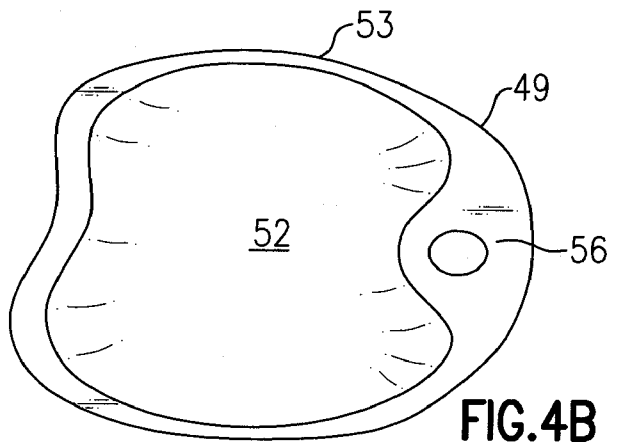
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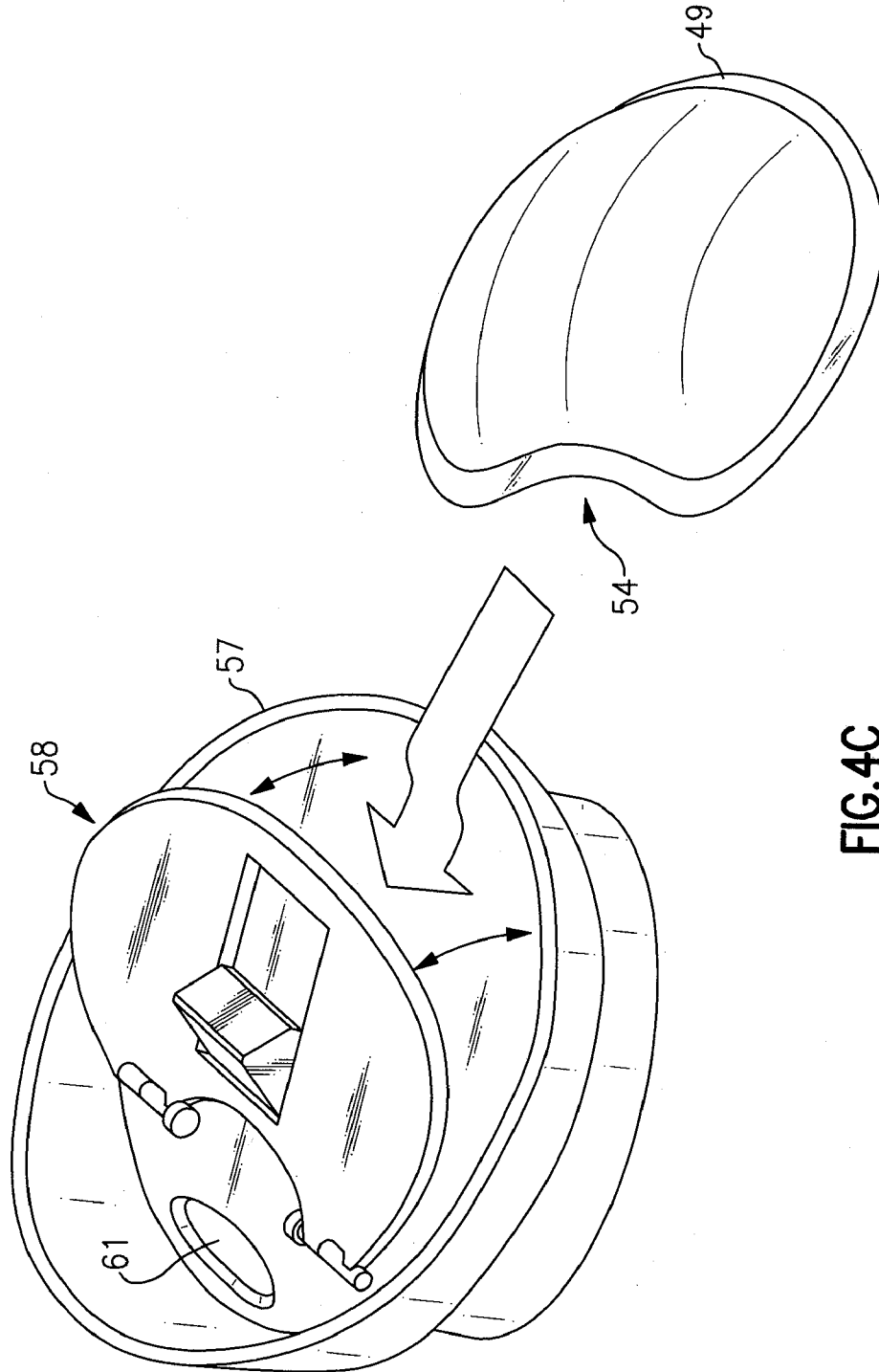
**FIG. 3**



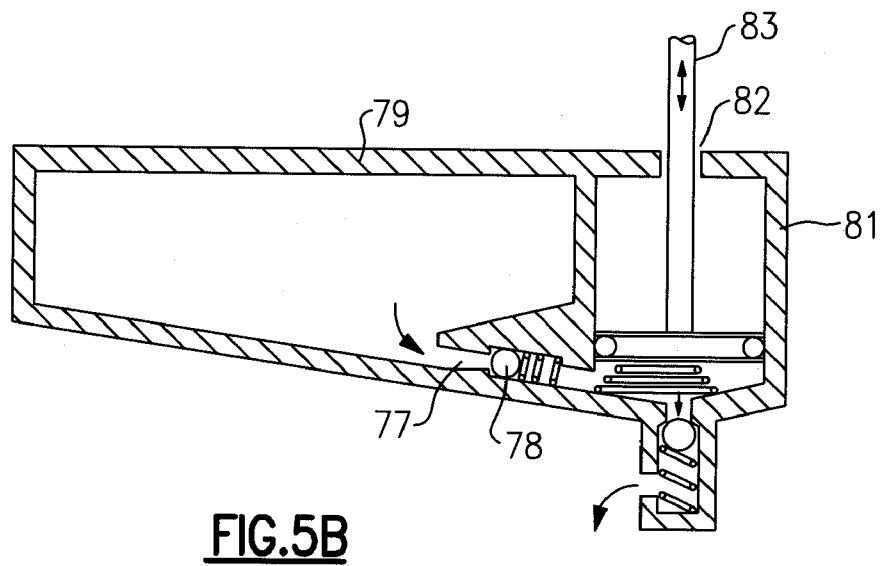
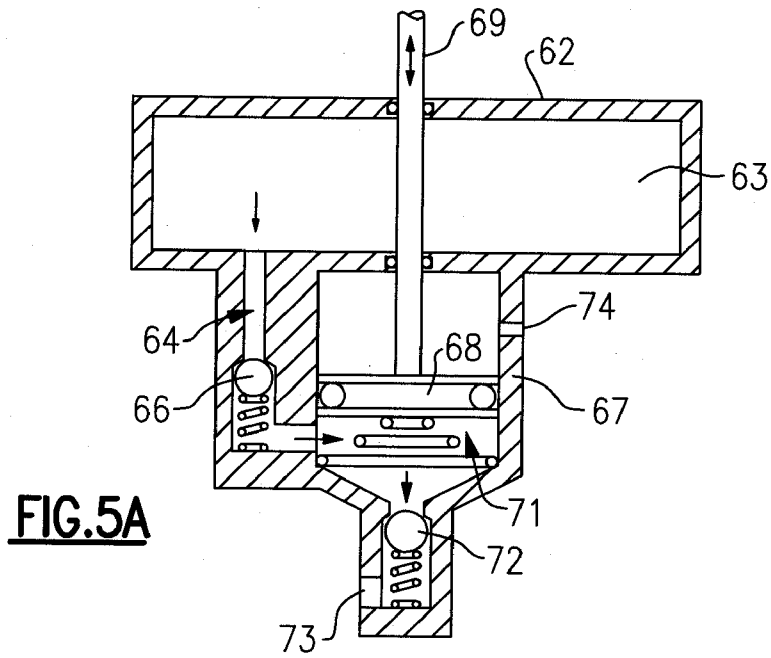
**FIG. 4A**

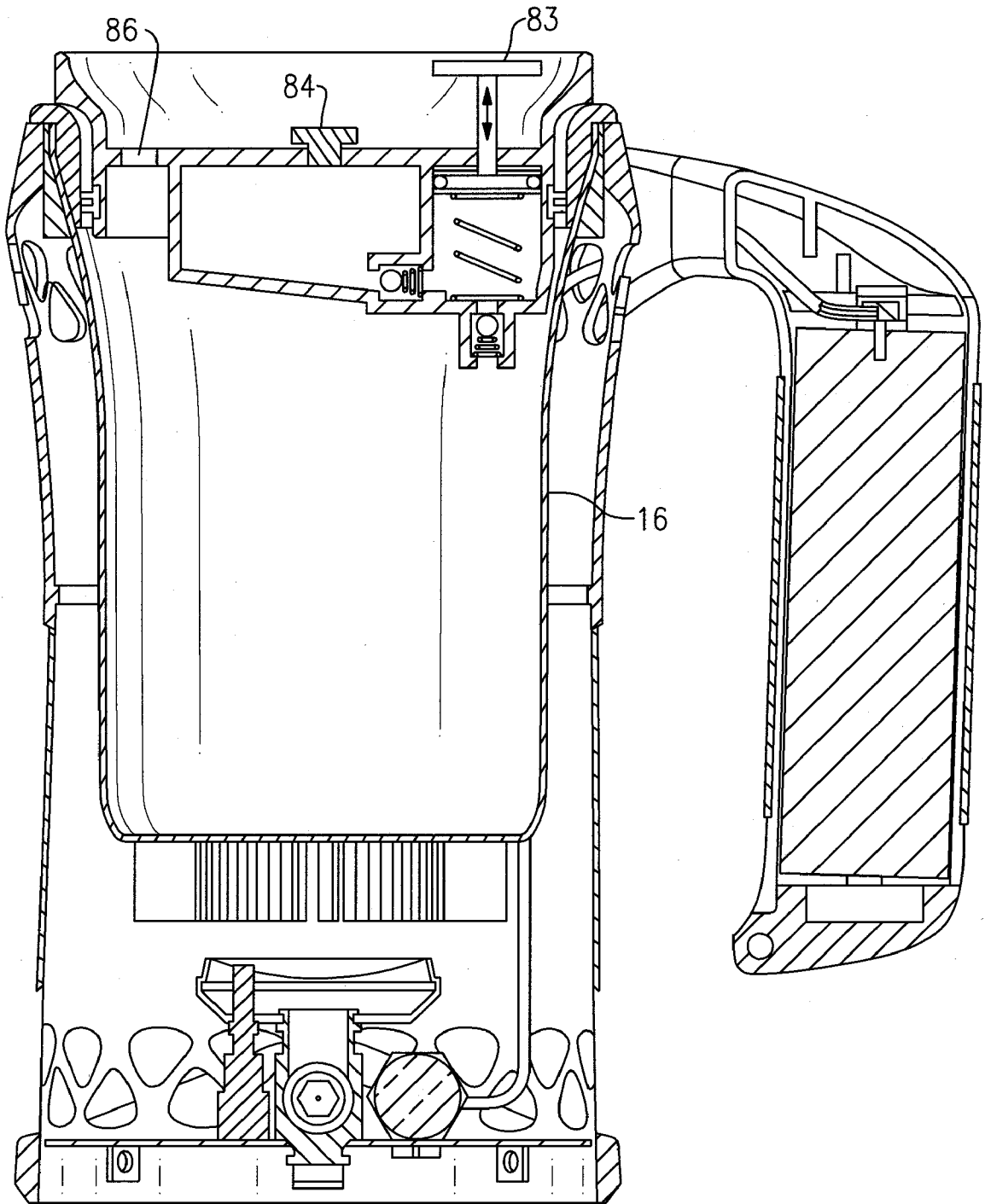


**FIG. 4B**



**FIG. 4C**





**FIG. 5C**



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/069275

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - A47J 31/00 (2010.01) USPC - 126/373.1 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC(8) - A47J 31/00, 31/06, 36/24 (2010.01) USPC - 99/279, 297, 319; 126/262, 263.01, 265, 344, 373.1; 426/433 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) PatBase; Google Patents		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,191,173 A (DEDEIAN et al) 04 March 1980 (04.03.1980) entire document	1
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Y		2
Y	US 2002/0134249 A1 (MELTON) 26 September 2002 (26.09.2002) entire document	2
A	US 6,964,223 B2 (O'LOUGHLIN) 15 November 2005 (15.11.2005) entire document	1, 2
A	US 5,012,795 A (SUZUKI et al) 07 May 1991 (07.05.1991) entire document	1, 2
A	US 2,863,037 A (JOHNSTONE) 02 December 1958 (02.12.1958) entire document	1, 2
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "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 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 26 January 2010		Date of mailing of the international search report 04 FEB 2010
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201		Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774