

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
18 January 2007 (18.01.2007)

PCT

(10) International Publication Number
WO 2007/008149 A1

(51) International Patent Classification:

F24C 3/14 (2006.01) *A47J 36/26* (2006.01)
F24C 5/20 (2006.01) *F24C 1/16* (2006.01)

(21) International Application Number:

PCT/SE2006/000848

(22) International Filing Date: 6 July 2006 (06.07.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

11/177,560 8 July 2005 (08.07.2005) US

(71) Applicant (for all designated States except US): **OPTIMUS INTERNATIONAL AB** [SE/SE]; Box 2044, S-128 21 Skarpnäck (SE).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **SVEDLUND, Joel** [SE/SE]; Boråsvägen 20, S-121 45 Johanneshov (SE).

(74) Agents: **ZACCO SWEDEN AB** et al.; P.O. Box 23101, S-104 35 Stockholm (SE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

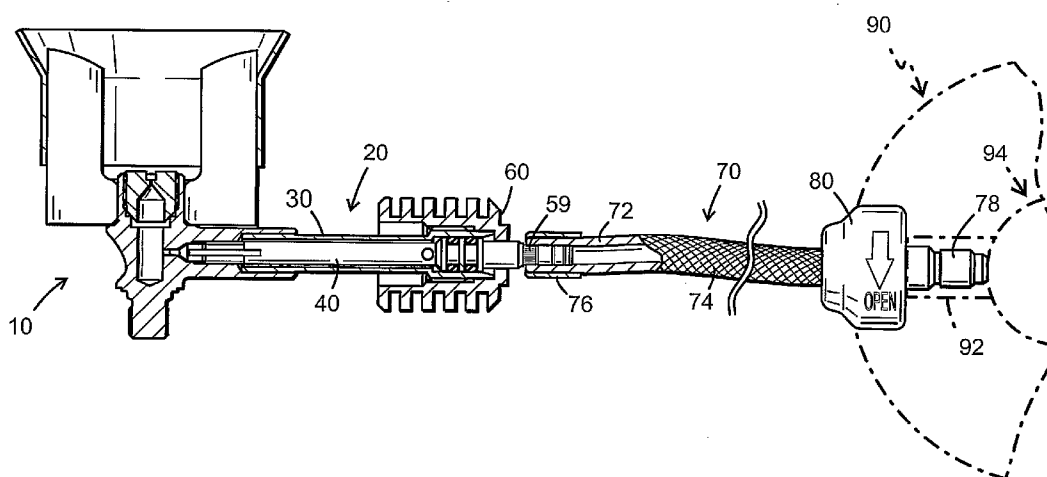
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: OUTDOOR STOVE BURNER CONTROL



(57) Abstract: A valve control arrangement for an outdoor stove burner (10). The burner has a valve housing and a valve body (40) rotatably supported in the valve housing. A fuel hose (70) is connected to the valve body (40) for communicating fuel from a fuel supply (90) through the valve body and into the valve housing. The fuel hose (70) is capable of being rotated for rotating the valve body (40) in the valve housing to thereby control a fuel flow to the burner (10).

Title: Outdoor stove burner control

FIELD OF THE INVENTION

5 This invention relates to a valve control arrangement in a burner for an outdoor stove. The invention also relates to an outdoor stove having such a valve control arrangement and further relates to a valve body for an outdoor stove burner.

BACKGROUND ART

10 Portable outdoor stoves need to be small and lightweight in order to not to use up excessive space and weight together with other outdoor equipment to be carried for example in a backpack. By personal safety reasons, the fuel control handle on outdoor stoves also must be placed at a location away from the flames and hot portions of the stove burner.

15

OBJECT OF THE INVENTION

An object of the invention is to address the above mentioned requirements and provide an improved outdoor stove that is capable of being both more lightweight and safely controlled.

20

SUMMARY OF THE INVENTION

In one aspect of the invention, a valve control arrangement in the outdoor stove burner has a valve housing and a valve body rotatably supported in the valve housing. A fuel hose is connected to the valve body for communicating fuel from a fuel supply through the valve body and into the valve housing. The fuel hose is also capable of being rotated for rotating the valve body in the valve housing to thereby control a fuel flow to the burner.

25

30

In another aspect of the invention, a valve body is adapted to be supported rotatably about an axis in a valve housing of an outdoor stove burner and is capable of controlling a fuel flow to the burner by being rotated in the valve housing. The valve body comprises a valving portion for closing and opening a fuel outlet from the valve housing to the burner. The valve body also comprises a fuel inlet in line with said axis for communicating fuel through the valve body and into the valve housing

and connectable to a fuel supply hose capable of being rotated for rotating the valve body in the valve housing to thereby control the fuel flow to the burner.

As the fuel flow is controlled by rotating the hose, a separate control mechanism in engagement with the valve body will be superfluous, and the user can safely control the fuel flow at a secure distance from the burner by grasping and rotating the end portion of the fuel hose that is adjacent to the fuel supply.

The end portion of the hose may be conveniently provided with a control handle such as a turning knob.

Other features and advantages of the invention are apparent from the following detailed description and the appended claims.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a section view of a burner for an outdoor stove having a valve control arrangement according to the invention;

FIG. 2 is a diagrammatic view corresponding to FIG. 1 of a burner connected to a fuel tank; and

FIG. 3 is a perspective view showing a complete outdoor stove according to the invention.

DETAILED DESCRIPTION OF EMBODIMENTS

The burner 10 in FIG. 1 for an outdoor stove shown is comprised of a burner housing 12 formed integrally with a valve housing 22 of a valve generally referenced by numeral 20.

The burner 10 is made of a good heat conducting material such as brass in order to be quickly heated in operation and efficiently evaporate liquid fuel passing through valve 20 and into burner 10. In order not to transfer excessive heat to fuel intake and valve control areas of the stove, the valve housing 22 is extended by a sleeve 30 of a less heat conducting material such as stainless steel. A forward end section of sleeve 30 is received in and soldered to a widened end section 26 of a valve bore 24 in the valve housing 22.

An elongate valve body or spindle 40 of the needle-valve type is received rotationally supported in the axial passage formed by sleeve 30 and valve bore 24. An approximately funnel-shaped or double-conical front end valving portion 42 of valve body 40 extends into a complementary shaped orifice or fuel outlet 14

connecting valve bore 24 to an evaporation chamber 16 in the burner housing 12. Other shapes of the valving portion are, however evident to a skilled person in the art. The walls of bore 24 and valve body 40 are in engagement by respective helical threads 26, 44 in a manner to axially displace valve body 40 on rotation thereof about an axis 57 and to thereby control the extent of the opening or closing of valve 20 to the burner 10. An elongate recess or flattened surface 46 on valve body 40 will allow flow of fuel past the threads 26, 44. While in the disclosed preferred embodiment, the rotatable valve body 40 is an axially displaceable valve body, the rotatable valve body may as well be a rotatable valve body that controls the extent of opening or closing of the valve, for example solely by its rotational movement (not shown).

Near an opposite rear end section 48, valve body 40 has an external sealing portion 50 received in a widened end portion 34 of sleeve 30. In the disclosed embodiment, the sealing portion 50 comprises a pair of annular recesses defined between three adjacent radial flanges 52. O-rings 54 in the respective recesses sealingly close the valve body 40 to the end portion 34 of sleeve 30. To minimize the danger of overheating the O-rings 54 in burner operation, a nut 60 made of a good heat conducting material such as aluminum and provided with external cooling flanges 62 is threaded onto the widened end portion 34 of sleeve 30. Nut 60 also has an annular rear end inner flange 64 for limiting a backward movement of the valve body 40 by engagement with the rear radial flange 52 thereof.

The rear end section 48 of valve body 40 also has a fuel inlet comprising an axial inlet bore 56 for communicating liquid fuel into the valve 20 from a fuel supply comprising a fuel tank or container 90 (FIG. 2, 3) via a fuel supply hose 70. Inlet bore 56 extends past the sealing portion 50 and has a transverse opening 58 entering into the interior space of the valve 20 that is defined between valve body 40 and the respective bores 24, 32 of valve housing 22 and sleeve 30.

With reference to FIG. 2, one end of fuel hose 70 is non-rotatably connected to the rear end section of valve body 40, and the other end of hose 70 is rotatably connected to an outlet opening 92 of the fuel container 90. Thereby, the hose 70 can be rotated manually by a user to rotate the valve body 40 in the valve housing 22 in order to control the rate of fuel flow into the burner 10.

The flexible fuel hose 70 may be of a common type having an inner tube 72 of PTFE surrounded by a protective braiding 74 of steel wire. When the braiding 74 is

secured to the ends of the hose 70 such as by a respective clamping sleeve 76 (only one shown in FIG. 2), the hose will be torsionally stiff and thereby capable of positively transmitting rotational movement to the valve body 40. Clamping sleeve 76 also secures the inner tube 72 of hose 70 to the rear end portion 48 of the valve body 40. A portion of the outer surface of the valve body rear end section may also have rifles 59 to enhance the transferable torsional force from hose 70 to valve body 40.

While a rotatable connection to the outlet opening 92 may be conceived in many ways, in the embodiment diagrammatically shown partly in phantom in FIG. 2, the other end (not shown) of the hose 70 is secured by the above mentioned clamping sleeve (not shown) to a male fuel inlet quick coupling nipple 78 that is rotatably supported in an outlet opening formed by a female quick coupling nipple 92 attached to a pump unit 94 (see also FIG. 3) of a fuel bottle 90. Such a pump unit having a female quick coupling is known as Part No. 9030V from Optimus International AB, Sweden.

To facilitate the rotation of the fuel hose 70, a control handle in the shape of a turning control knob 80 (FIG. 2, 3) is concentrically secured around the hose 70 to be conveniently grasped between a user's thumb and index finger for rotating the hose 70 when controlling the fuel flow to the burner 10.

While in the above described embodiment the fuel hose 70 is rotatable relative to the fuel tank 90, the fuel hose may alternatively be non-rotatably connected to the fuel tank, as indicated in phantom in FIG. 3. In that case the control knob 80 is replaced by a screw cap for the fuel tank 90 and connected to the hose 70. Also in this case the screw cap can be replaced by a quick coupling. The fuel tank 90, for example a rotationally symmetric flask, can then be rotated for example by being rolled on the ground to rotate the hose 70 and thereby the valve body 40.

The foregoing detailed description is given primarily for clearness of understanding and no unnecessary limitations are to be understood therefrom. Modifications will become obvious to those skilled in the art upon reading this disclosure and may be made without departing from the spirit of the invention or the scope of the appended claims.

WHAT IS CLAIMED IS:

1. A valve control arrangement in burner for an outdoor stove, comprising:
a valve housing;
a valve body rotatably supported in the valve housing; and
5 a fuel hose connected to the valve body for communicating fuel from a fuel supply through the valve body and into the valve housing and capable of being rotated for rotating the valve body in the valve housing to thereby control a fuel flow to the burner.
2. The arrangement according to claim 1, wherein said valve is adapted to
10 control the fuel flow by being axially displaced in the valve housing when rotated.
3. The arrangement according to claim 1, wherein said valve is adapted to be axially displaced by respective interengaging helical threads in the valve housing and on the valve body.
4. The arrangement according to claim 1, wherein the fuel hose is rotatably
15 connected to the fuel supply.
5. The valve arrangement according to claim 4, further comprising a control handle on the fuel hose for manually rotating the hose.
6. An outdoor stove having a burner provided with a valve control arrangement according to claim 1.
- 20 7. A valve body adapted to be supported rotatably about an axis in a valve housing of an outdoor stove burner and capable of controlling a fuel flow to the burner by being rotated in the valve housing, the valve body comprising:
a valving portion for closing and opening a fuel outlet from the valve housing to the burner; and
25 a fuel inlet in line with said axis for communicating fuel through the valve body and into the valve housing and connectable to a fuel supply hose capable of being rotated for rotating the valve body in the valve housing to thereby control the fuel flow to the burner.

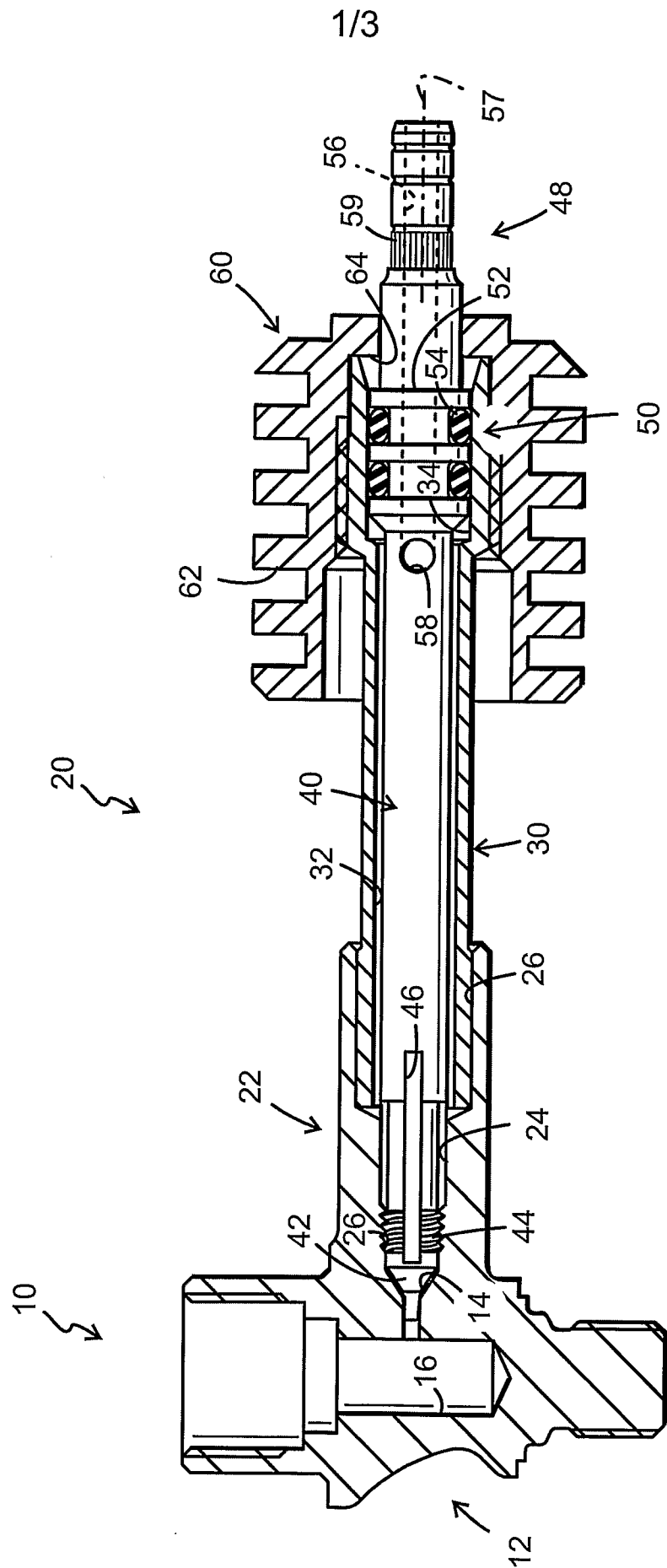


FIG. 1

2/3

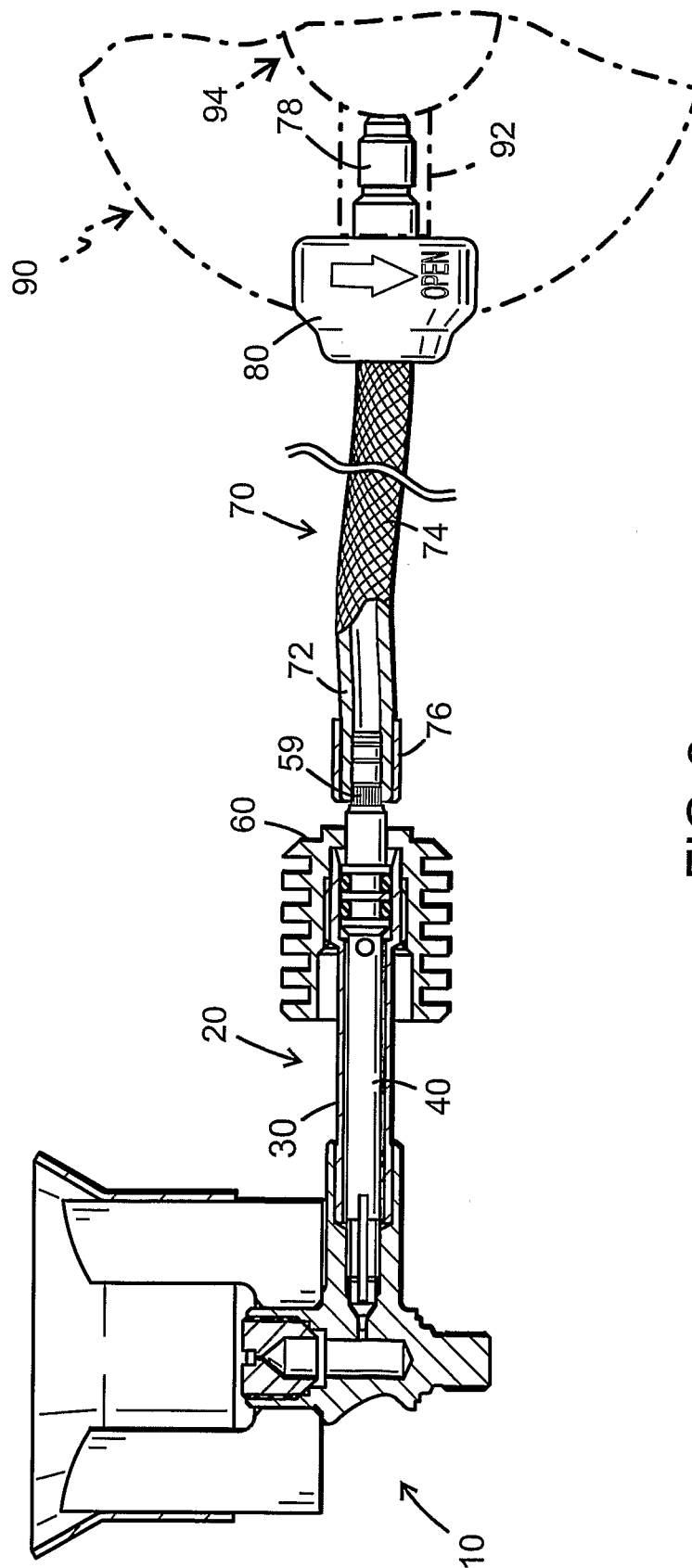
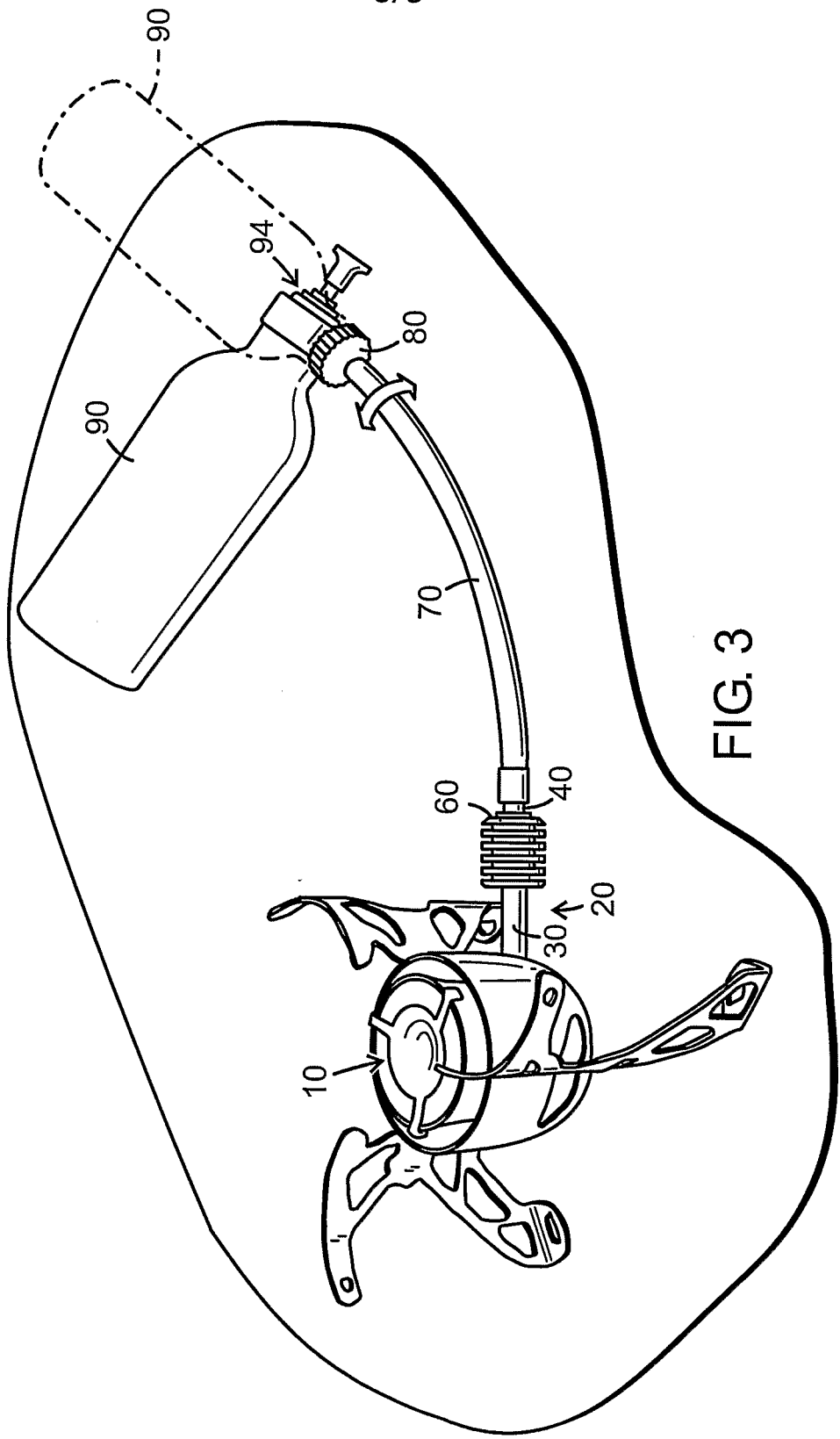


FIG. 2

3/3



INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2006/000848

A. CLASSIFICATION OF SUBJECT MATTER

IPC: 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: F24C, A47J

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

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0594964 A2 (THE COLEMAN COMPANY, INC.), 4 May 1994 (04.05.1994) --	
A	US 3900281 A (H.L. PENBERTHY), 19 August 1975 (19.08.1975) --	
A	US 4092974 A (I. ZENZABURO), 6 June 1978 (06.06.1978) --	
A	US 6129078 A (C.R. MOULDER), 10 October 2000 (10.10.2000) -- -----	

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

* 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

29 Sept 2006

Date of mailing of the international search report

05-10-2006

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Sune Söderling / MRo
Telephone No. +46 8 782 25 00

International patent classification (IPC)**F24C 3/14** (2006.01)**F24C 5/20** (2006.01)**A47J 36/26** (2006.01)**F24C 1/16** (2006.01)**Download your patent documents at www.prv.se**

The cited patent documents can be downloaded at www.prv.se by following the links:

- In English/Searches and advisory services/Cited documents (service in English) or
- e-tjänster/anförda dokument (service in Swedish).

Use the application number as username.

The password is **MKLHNAYSOP**.

Paper copies can be ordered at a cost of 50 SEK per copy from PRV InterPat (telephone number 08-782 28 85).

Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT

Information on patent family members

04/03/2006

International application No.

PCT/SE2006/000848

EP	0594964	A2	04/05/1994	AU	652311 B	18/08/1994
				AU	3408993 A	19/05/1994
				CA	2089804 A,C	29/04/1994
				DE	69321551 D,T	04/03/1999
				JP	2740114 B	15/04/1998
				JP	6207716 A	26/07/1994
				KR	188078 B	01/06/1999
				US	5370527 A	06/12/1994

US	3900281	A	19/08/1975	AT	319775 A	15/09/1977
				AT	343318 B	26/05/1978
				GB	1496091 A	21/12/1977
				SE	398963 B,C	30/01/1978
				SE	7504615 A	27/10/1975
				US	3829278 A	13/08/1974

US	4092974	A	06/06/1978	US	4177790 A	11/12/1979

US	6129078	A	10/10/2000	AU	5703998 A	03/07/1998
				CA	2283841 A	18/06/1998
				US	5983883 A	16/11/1999
				WO	9826218 A	18/06/1998
