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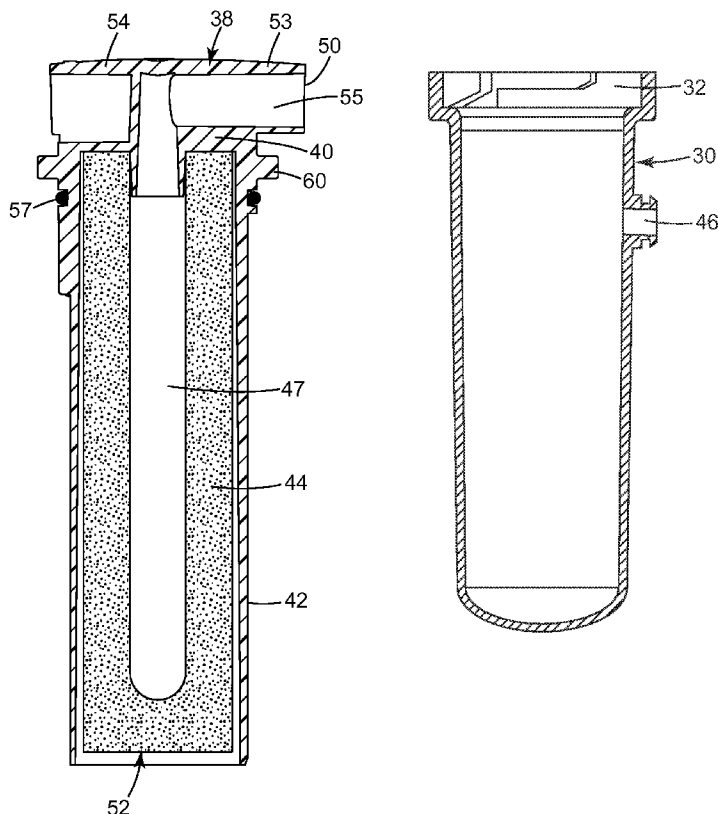
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[Continued on next page]

(54) Title: LIQUID FILTRATION SYSTEMS



(57) Abstract: Provided are liquid filtration systems and filter elements. An aspect of the invention provides a filter element comprising a filter block (44) and an end cap (40) having a handle (38) with a passage (55), the passage operatively connecting the outlet of the filter block with an end location and a shroud (42) comprising an opening (52), the shroud (42) being adjacent to the end cap (40), wherein the inlet of the filter block is directly operatively connected to the opening of the shroud (42). Another aspect of the invention provides a filtration system comprising the filter element and a pressure vessel (30). The pressure vessel (30) comprises an inlet port (46) that is in use adjacent to the shroud such that upon fluid flowing through the inlet port of the pressure vessel, the fluid contacts the shroud and the direction of flow changes, and wherein the inlet port of the pressure vessel is in fluid communication with the opening (52) of the shroud (42).

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FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, 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:

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- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER

INV. C02F1/00 B01D35/04 B01D29/90 B01D29/33

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)
C02F B01D

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.
X	US 3 950 253 A (STERN EMANUEL) 13 April 1976 (1976-04-13) figures 1,3	1-3
X	WO 97/30938 A (KATADYN PRODUKTE AG [CH]; PREISIG MARCO [CH]; AGOSTINO ADRIANO D [CH]) 28 August 1997 (1997-08-28) figure 3	1-3
X	US 5 130 020 A (MECKSTROTH ALAN F) 14 July 1992 (1992-07-14) figures 3,4	1-3
X	US 6 395 170 B1 (HUGHES DOUGLASS E [US] ET AL) 28 May 2002 (2002-05-28) figures 3,4	1-3
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 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 document 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)
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- *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.
- *Z* document member of the same patent family

Date of the actual completion of the international search

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Date of mailing of the international search report

14/05/2008

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 328 609 A (MAGNUSSON JON H. [US] ET AL) 12 July 1994 (1994-07-12) figure 8 -----	1-4
A	US 2002/036162 A1 (MAGNUSSON JAN H [US] ET AL) 28 March 2002 (2002-03-28) figure 3 -----	1-4
A	JP 05 146778 A (MITSUBISHI RAYON CO) 15 June 1993 (1993-06-15) figures 1,2 -----	1-4
A	US 6 024 867 A (PARISE MICHAEL C [US]) 15 February 2000 (2000-02-15) figure 2 -----	1-4
A	US 6 569 329 B1 (NOHREN JR JOHN E [US]) 27 May 2003 (2003-05-27) figure 2 -----	1-3
A	US 4 776 956 A (GANNAWAY RICHARD M [US]) 11 October 1988 (1988-10-11) cited in the application figure 3 -----	1,4
A	WO 00/37363 A (KIMBERLY CLARK CO [US]) 29 June 2000 (2000-06-29) cited in the application figures 3,9 -----	1,4
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/064719

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see additional sheet

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9

The subject matter of the first invention is concentrated on a filter element with an end cap comprising a gripping member defining a flow passage and with a shroud around the filtering material (without defining the intended task of the shroud in claim 1, but corresponding definition in claim 4). Taking into account the present description the subject matter of independent claims 1 and 4 solves two independent problems to be solved: to improve the handling and compact design of the filter cartridge (solution: handle with filtrate channel) and to improve the distribution of the feed over the filtering material (solution: corresponding shroud around the filtering material).

2. claims: 10-17

The subject matter of the second invention is concentrated on a filter with means to prevent false mounting of the filter element within the housing. The solution is a certain interference between the filter element and a lid being part of the pressure vessel.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/064719

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