

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
19 February 2004 (19.02.2004)

PCT

(10) International Publication Number
WO 2004/015225 A1

(51) International Patent Classification⁷: **E04H 4/12**

(21) International Application Number:
PCT/IT2003/000481

(22) International Filing Date: 31 July 2003 (31.07.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
CR2002A000013 8 August 2002 (08.08.2002) IT

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

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

Declaration under Rule 4.17:

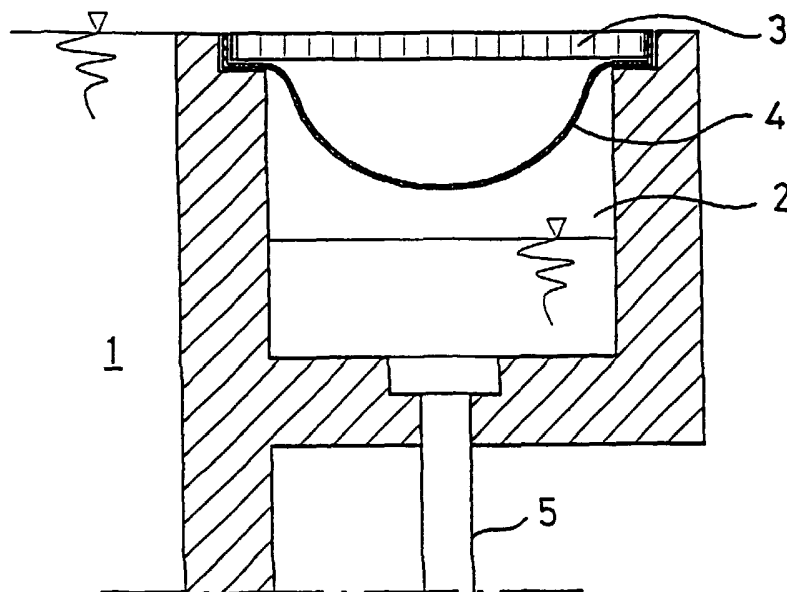
— of inventorship (Rule 4.17(iv)) for US only

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: GRAVITY FILTER FOR OVERFLOWING SWIMMING POOLS



(57) Abstract: A gravity filter for overflowing swimming pools comprising a basin (1) and an overflowing channel (2) closed in the upper part by a pedestrian covering, wherein the filter is made by means of a filtering mat (4), positioned in said overflowing channel (2), above the water level of said channel (2) and below the water level of said basin (1), so that water overflowing from said basin (1) to said channel (2) passes through said filtering mat (4).

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GRAVITY FILTER FOR OVERFLOWING SWIMMING POOLS

The present invention relates to a gravity filter for overflowing swimming pools.

5 Overflowing swimming pools, or spillway swimming pools, comprise an overflowing channel, positioned along at least one side of the perimetric edge of the basin of the swimming pool, that enables to keep the water level at the same height as the edge, as water is continuously overflowing from the basin into the channel
10 itself.

Said overflowing channel is connected by means of a discharge pipe to a water purification and re-circulation circuit, generally comprising a pump, a physical-mechanical type filter, for example a sand filter or a cartridge filter, and nozzles for
15 rechannelling the water into the basin. Said circuit normally also comprises a compensation tank, underlying the overflowing channel.

Water overflows from the edge of the basin, falls into the channel, flows into the compensation tank, then is pumped, filtered
20 and rechannelled into the basin.

These swimming pools have several disadvantages related to the above described water purification and re-circulation system.

The physical-mechanical type filter, in fact, causes a considerable head loss in the water circuit and forces the need for a
25 pump with a rather high discharge head.

In addition, head loss of the filter is considerably increased

by its progressive clogging, and this forces to frequent cleaning or replacement, as well as the use of a pump capable of guaranteeing re-circulation even in conditions of dirty filter, with higher installation, handling and maintenance costs.

5 Another disadvantage is that this type of filter is not very effective, as experience shows that water tends to flow through preferential courses, without going over the entire filtering surface, which therefore is only partially used.

The object of the present invention is to eliminate these
10 inconveniences.

In particular, the main object of the invention is to produce a low speed gravity filter for overflowing swimming pools, for achieving high filtering efficiency, but having low head losses of the water purification and re-circulation circuit.

15 A further object of the invention is that said losses are constant during operation of the swimming pool, and in particular that they are not influenced by the progressive clogging of the filter.

Therefore it is the object of the invention to realize a gravity filter for overflowing swimming pools, thanks to which a low
20 discharge head pump is sufficient for the water purification and re-circulation circuit, reducing the installation costs and energy consumption.

It is also object of the invention that said filter is low-cost, simple to clean or replace, and also enables the development of
25 biomass acting as a biological purifier.

The objects, that will be more evident in the following

description, are achieved with the present invention, consisting of a gravity filter for overflowing swimming pools comprising a basin and an overflowing channel closed on the upper side by a pedestrian covering, characterised in that it is made by means of a filtering mat, positioned in the overflowing channel above the water level of said channel and below the water level of said basin, so that water overflowing from said basin to said channel passes through said filtering mat.

To facilitate the periodical cleaning or for replacement, the filtering mat is anchored to the sides of the overflowing channel, so that it can be easily removed.

The main advantage of the invention consists in that the filter, realized by means of said filtering mat, is separated from the water re-circulation circuit, and therefore does not introduce any head loss in the circuit itself.

Another advantage is that the water passes through the filtering mat at a very low speed, determined only by the fall by gravity, and high filtering efficiency is therefore achieved without using expensive materials with very fine porosity.

Yet another advantage is that the aerobic working conditions of the filter permit the development of bacterial flora, which can act as a biological purifier in those private swimming pools that are not obliged by the law to disinfect the water.

Further characteristics and advantages of the invention will be more evident from the detailed description hereinafter given, with the help of the figures showing an embodiment thereof,

illustrated as a non-limiting example.

Figure 1 is a schematic cross-sectional view of the edge of an overflowing swimming pool, provided with a filter according to the invention.

5 Figures 2 and 3 show schematically the invention applied to the walls of the overflowing channel of two known types of swimming pools.

Figures 4 and 5 are sketches showing two operating conditions of the filter that is the object of the present invention.

10 Figure 6 shows some details of a preferred embodiment of the invention.

Referring now to the figures, the invention relates to a gravity filter for overflowing swimming pools or spillway pools, essentially comprising a basin 1 and an overflowing channel 2, closed on the
15 upper part by a pedestrian covering.

Said covering is made according to known techniques for overflowing swimming pools, for example by means of a removable footway grating 3, or by means of a slab 6 supported by pillars 11.

20 The gravity filter, according to the invention, is made by means of a filtering mat 4, positioned in the overflowing channel 2 above the water level of the channel 2 and below the water level of the basin 1, so that water overflowing from the basin 1, and falling by gravity into the channel 2, passes through said filtering mat 4.

25 The filtering mat 4 is advantageously made of a needle-loomed non-woven fabric, or a synthetic material of the kind used

for filtering surfaces of known cartridge filters.

Reversible hooking means for the filtering mat 4 are provided along the perimeter of the overflowing channel 2, allowing to separate the mat 4 from the overflowing channel 2, for cleaning or
5 replacement.

In a preferred embodiment, said hooking means are made by means of a beam 8, with rotating hooks 9 suitably spaced, and the filtering mat 4 comprises retaining edge ropes 7, fit for making the edges of the mat rigid and hang it onto said hooks 9.

10 The rotating hooks 9 can be positioned transversally with respect to the overflowing channel 2, to keep the edges of the filtering mat 4 hooked up, or rotated and positioned longitudinally with respect to the channel, leaving the edges of the mat free during assembly.

15 The beam 8 can act as a baffle to convey the water towards the central part of the filtering mat 4, preventing water from falling directly into the overflowing channel 2 without passing through the mat. Alternatively, baffles 10 can be made by means of waterproof fabric strips, positioned to cover the edges of the filtering mat 4.

20 The overflowing channel 2 is connected, by means of at least one discharge pipe 5, to a re-circulation circuit, not shown, for rechannelling filtered water to the basin 1.

While the swimming pool is being used, the water that overflows from the basin 1 passes through the filtering mat 4, then
25 falls into the overflowing channel 2, from which it flows out into the re-circulation circuit through the discharge pipe 5.

When the filtering mat 4 is clean, water flows mainly through its central zone, as shown in fig. 4. When, with the passing of time, the central zone of the filtering mat 4 is partially or totally clogged by dirt or bacterial flora (in the case of water that is not disinfected),
5 the water accumulates on the mat and starts to flow from its sides, through zones of the mat that are still clean, as is schematised in fig. 5.

Therefore, the whole available filtering surface is used, the filtering effectiveness is constant and the filter can be replaced less
10 frequently than known kind of filters.

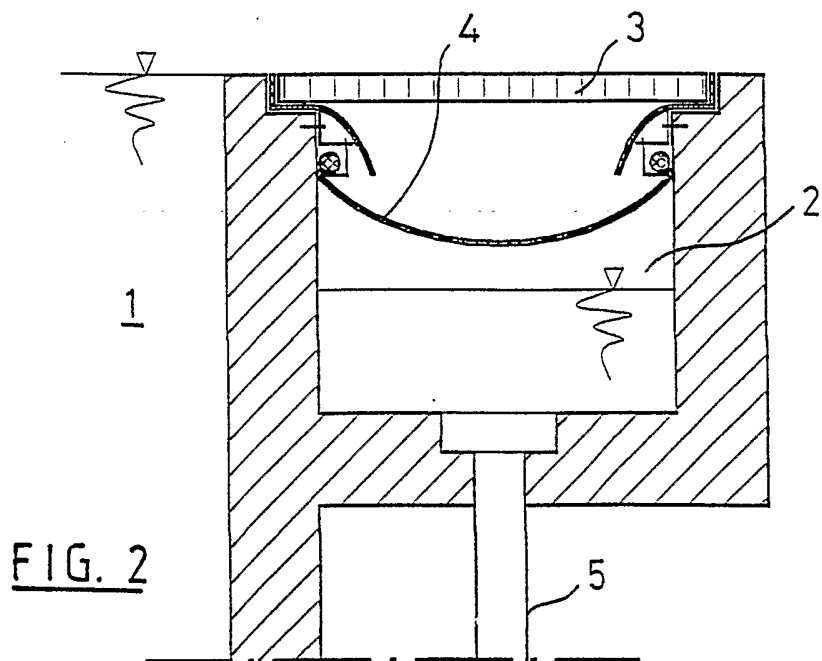
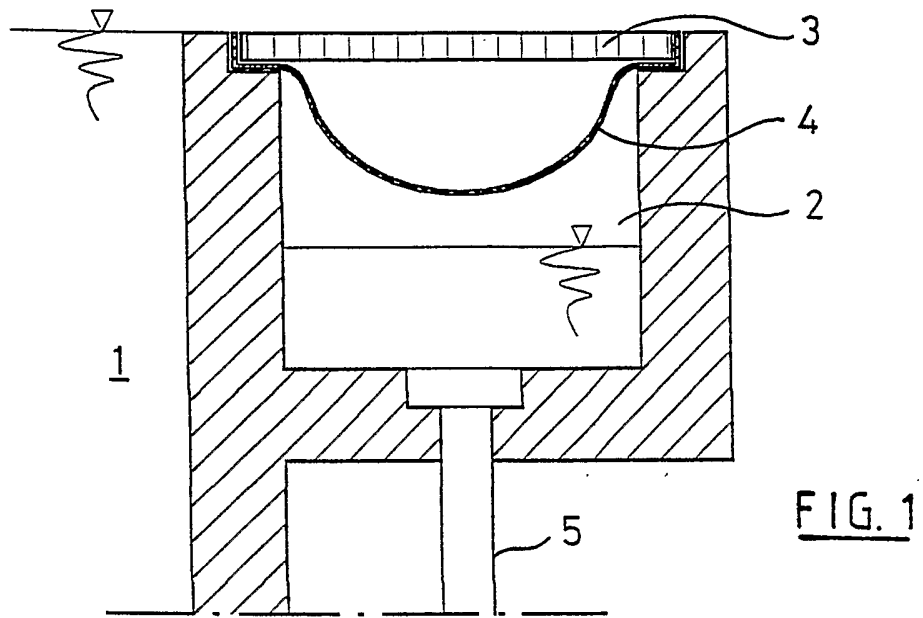
The filtering mat 4 guarantees high filtering efficiency as the water always passes through at a very low speed; in addition it can be made with economical materials and can be easily removed for cleaning or replacement.

15 In conclusion, thanks to the invention no filter is provided on the re-circulation circuit, the only head losses are those caused by elevation, flow resistance of piping and inlet / outlet losses, and in particular they are constant and not influenced by the progressive clogging of the filtering mat 4.

20 Low pumping power is then required by the recirculation circuit, an economical type of pump can be used and energy consumption is reduced.

CLAIMS

1. Gravity filter for overflowing swimming pools comprising a basin (1) and an overflowing channel (2) closed in the upper part by a pedestrian covering (3, 6), characterised in that it is made by means of a filtering mat (4), positioned in said overflowing channel (2) above the water level of said channel (2) and below the water level of said basin (1), so that water overflowing from said basin (1) to said channel (2) passes through said filtering mat (4).
2. Filter according to claim 1, characterised in that said filtering mat (4) is made of needle-loomed non-woven fabric.
3. Filter according to claim 1, characterised in that said filtering mat (4) comprises retaining ropes (7) at the edges, fit for hanging said mat (4) to reversible hooking means associated to the side walls of the overflowing channel (2).
4. Filter according to claim 3, characterised in that said hooking means comprise a support (8) to which rotating hooks (9) are associated.
5. Filter according to claim 1, characterised in that said overflowing channel (2) comprises baffles (8, 10) fit for conveying the water towards the central zone of the filtering mat (4).



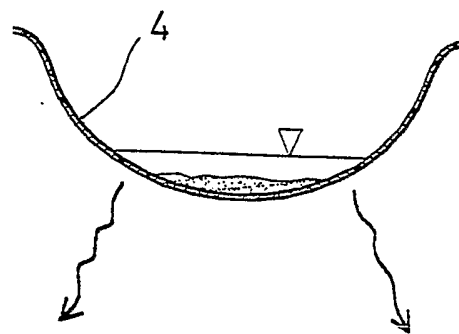
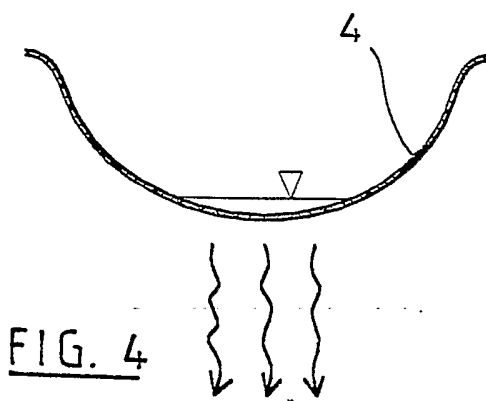
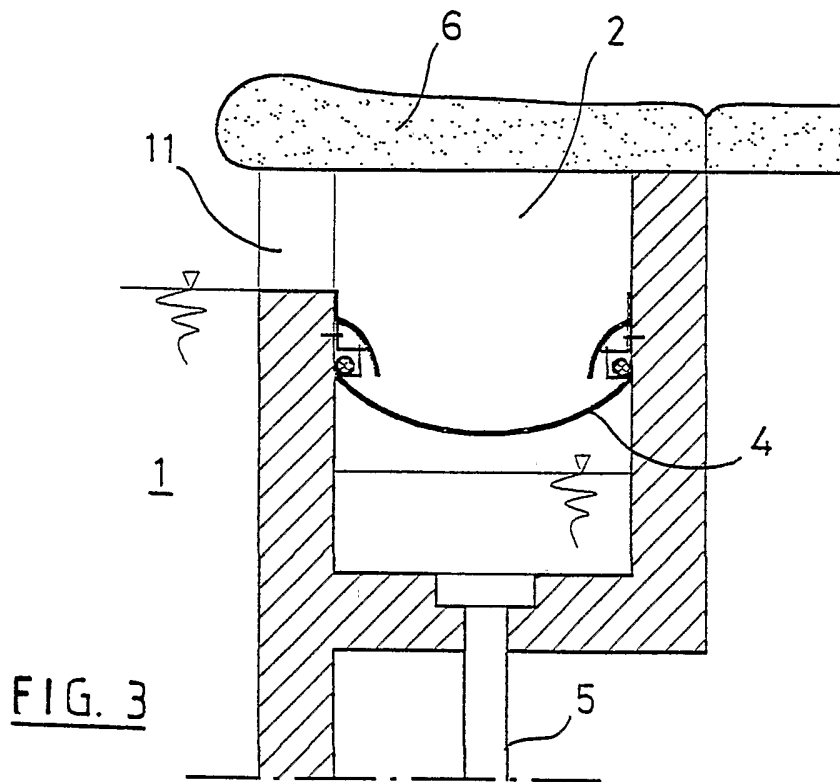


FIG. 5

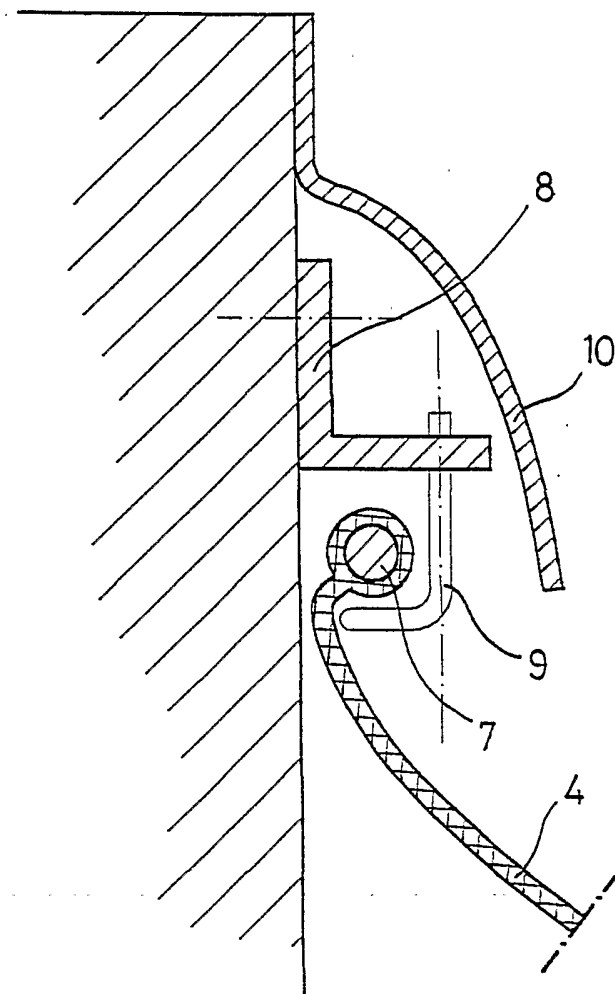


FIG. 6

INTERNATIONAL SEARCH REPORT

Internation application No
PCT/IT 03/00481

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 E04H4/12		
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 E04H		
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 5 787 519 A (SMITH ROBERT LESLIE) 4 August 1998 (1998-08-04)	1
Y	column 6, line 55 - line 62; figure 3 ---	2
Y	US 5 725 761 A (PHILLIPS HAROLD L) 10 March 1998 (1998-03-10) column 7, line 55 - line 56 ---	2
A	FR 2 768 065 A (MARTIN DOMINIQUE) 12 March 1999 (1999-03-12) the whole document -----	1,2
<input type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> 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	
24 October 2003	31/10/2003	
Name and mailing address of the ISA 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	Authorized officer Fordham, A .	

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internatio	plication No
PCT/IT 03/00481	

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