



(51) International Patent Classification:

B01D 29/00 (2006.01) B01D 29/21 (2006.01)

(21) International Application Number:

PCT/TR2024/050835

(22) International Filing Date:

18 July 2024 (18.07.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2023/017689 19 December 2023 (19.12.2023) TR

(71) Applicant: **ARCELIK ANONIM SIRKETI** [TR/TR];
Karaagac Caddesi 2-6, Sutluce, 34445 Beyoglu/Istanbul
(TR).

(72) Inventors: **TAKIT, Arda**; Arcelik A.S., Sutluce Karaagac
Caddesi No:2/6, 34445 Beyoglu/Istanbul (TR). **POLAT,**
Murathan Eren; Arcelik A.S., Sutluce Karaagac Cadde-
si No:2/6, 34445 Beyoglu/Istanbul (TR). **DEDA, Bugra**;
Arcelik A.S., Sutluce Karaagac Caddesi No:2/6, 34445 Be-
yoglu/Istanbul (TR).

(74) Agent: **ANKARA PATENT BUREAU**; Mustafa Ke-
mal Mahallesi Dumlupinar Bulvari Eskisehir Yolu 9. Km
No:274/7 B Blok 14. Kat No:161, 34707 Cankaya/Ankara
(TR).

(81) Designated States (*unless otherwise indicated, for every
kind of national protection available*): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG,
KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY,
MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA,
NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO,
RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH,

TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS,
ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every
kind of regional protection available*): ARIPO (BW, CV,
GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST,
SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ,
RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ,
DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT,
LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE,
SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: A FILTER FOR HOUSEHOLD APPLIANCES

(57) Abstract: The present invention relates to a filter (1) comprising a body (2) which has a base (3) and side walls (13); a filtering member (6) which is provided on the side walls (13) of the body (2) and which filters the water; a first bearing (109 which extends perpendicular to the plane of the base (3); a lid (4) which is provided at the ceiling of the body (2); a second bearing (11) which extends perpendicular to the plane of the lid (4), which is connected to the water source at one end and which opens into the filter (1) at the other end, and which is positioned on the same axis as the first bearing (10); an actuation member (9) which is in the form of a worm screw, which extends along the horizontal axis between the base (3) and the lid (4), which is borne on the first and second bearings (10 and 11) and which rotates around this axis; a scraper (7) which is disposed on the actuation member (9) and which enables the waste on the filtering member (6) to be scraped and transported as the edges thereof contact the filtering member (6); a receptacle (5) which is provided behind the lid (4) and wherein the waste carried by the scraper (7) is collected; and at least two openings (12) which are disposed along the actuation member (9) and which enable the water taken into the actuation member (9) through the second bearing (11) to be carried out.

WO 2025/136282 A1

A FILTER FOR HOUSEHOLD APPLIANCES

The present invention relates to a microfiber filter used in household appliances which use water.

- 5 The large volume occupied by filters used in the household appliances makes the use thereof in limited volumes difficult. Especially in small household appliances, various challenges are encountered in placing the filters in the body. Moreover, cleaning the microfiber filter is very difficult for the user and the cleaning process takes a very long time. Furthermore, using a filter which is not suitable for the
- 10 water flow in the household appliance prevents the water flow from being distributed evenly in the filter and prevents the filter from working efficiently.

In the state of the art European Patent Application No. EP4115966, a mechanism is disclosed, which sweeps the filter surface by sweeping the same by means of a worm screw.

- 15 Another document in the state of the art is the German Patent Application No. DE102022207949. This document discloses the cleaning of the filter surface by means of a sweeper.

The aim of the present invention is the realization of an effective filter used in the household appliances which use water.

- 20 The filter realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a body which has a base and side walls; a filtering member which is provided on the side walls of the body and which filters the water; a first bearing which extends perpendicular to the plane of the base; a lid which is provided at the ceiling of the body; a second
- 25 bearing which extends perpendicular to the plane of the lid, which is connected to the water source at one end and which opens into the filter at the other end, and which is positioned on the same axis as the first bearing; an actuation member which is in the form of a worm screw, which extends along the horizontal axis between the base and the lid, which is borne on the first and second bearings and
- 30 which rotates around this axis; a scraper which is disposed on the actuation

member and which enables the waste on the filtering member to be scraped and transported as the edges thereof contact the filtering member; a receptacle which is provided behind the lid and wherein the waste carried by the scraper is collected; and at least two openings which are disposed along the actuation
5 member and which enable the water taken into the actuation member through the second bearing to be carried out.

By means of the present invention, the water taken through the second bearing is enabled to be distributed homogeneously in the filter. Thus, the water to be filtered is distributed homogeneously in the filter through a plurality of openings
10 on the actuation member. Consequently, the effectiveness and performance of the filter are improved. Moreover, by delaying the clogging of the filter, the filter is enabled to be used for a longer period of time without user intervention.

The actuation member is used both to move the scraper thereon and to ensure water entry into the filter. By means of the plurality of openings on the actuation
15 member, the water is directed to the entire filter more homogeneously and efficiently than the case where the water enters the filter through a single point.

The lid holds all components of the filter together and also enables the forming of a closed area like a receptacle where the accumulated waste is collected.

The scraper enables microfiber and similar waste particles accumulated on the
20 filter surface to be swept away as a result of the rotation of the actuation member. By turning the actuation member clockwise or counterclockwise, the scraper moves back and forth on the actuation member.

In an embodiment of the present invention, the filter comprises a sealing member which is disposed all around the edges of the scraper, which contacts the filtering
25 members from the inside of the filter and which enables the surfaces of all filtering members to be scraped.

In the embodiment of the present invention, by rotating the actuation member, the sealing member attached to the edges of the scraper moves linearly in the filter from the base to the lid while contacting the filtering member. During this
30 movement, the waste particles retained by the filtering member is scraped off the

filtering member by the scraper and carried and swept towards the lid. By means of the sealing member, microfiber and similar waste particles on the surface of the filtering member are effectively swept away during the scraping process. The water is taken into the actuation member through the second bearing and hence
5 into the filter. The water flowing in the actuation member passes through the openings in the wall of the actuation member to be distributed into the filter. Thus, by means of both the scraper and the water distributed by the actuation member, waste particles are scraped off the filtering member, swept towards the lid and collected in the receptacle. Afterwards, the lid is opened by the user, the waste
10 accumulated in the receptacle is cleaned and the filter is made ready for reuse.

By means of the present invention, a simpler filter is realized. Moreover, the filtering efficiency is increased while ensuring that the surface of the filtering members remain clean for a longer time. Furthermore, by means of the receptacle wherein the waste cleaned off the surfaces of the filtering members and turned
15 into lumps is collected, the filter can be easily cleaned without the user being required to contact the waste.

A filter realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 – is the perspective view of a filter.

20 Figure 2 – is the exploded view of the filter.

Figure 3 – is the sideways cross-sectional view of the filter.

Figure 4 – is the sideways view of the filter when the scraper is in the position A.

Figure 5 – is the sideways view of the filter when the scraper is in the position B.

Figure 6 – is the sideways view of the lid and the receptacle when the waste
25 particles are collected.

Figure 7 – is the sideways view of the lid and the receptacle when the waste particles are cleaned.

The elements illustrated in the figures are numbered as follows.

1. Filter

2. Body
3. Base
4. Lid
5. Receptacle
- 5 6. Filtering member
7. Scraper
8. Sealing member
9. Actuation member
10. First bearing
- 10 11. Second bearing
12. Opening
13. Side wall
14. Wall
15. Step
- 15 The filter (1) comprises a body (2) which has a base (3) and side walls (13); a
filtering member (6) which is provided on the side walls (13) of the body (2) and
which filters the water; a first bearing (10) which extends perpendicular to the
plane of the base (3); a lid (4) which is provided at the ceiling of the body (2); a
second bearing (11) which extends perpendicular to the plane of the lid (4), which
20 is connected to the water source at one end and which opens into the filter (1) at
the other end, and which is positioned on the same axis as the first bearing (10);
an actuation member (9) which is in the form of a worm screw, which extends
along the horizontal axis between the base (3) and the lid (4), which is borne on
the first and second bearings (10 and 11) and which rotates around this axis; a
25 scraper (7) which is disposed on the actuation member (9) and which enables the
waste on the filtering member (6) to be scraped and transported as the edges
thereof contact the filtering member (6); a receptacle (5) which is provided behind
the lid (4) and wherein the waste carried by the scraper (7) is collected; and at

least two openings (12) which are disposed along the actuation member (9) and which enable the water taken into the actuation member (9) through the second bearing (11) to be carried out (Figure 1 and Figure 2).

By means of the present invention, the water taken through the second bearing (11) is enabled to be distributed homogeneously in the filter (1). Thus, the water to be filtered is distributed homogeneously in the filter (1) through a plurality of openings (12) on the actuation member (9). Consequently, the effectiveness and performance of the filter (1) are improved. Moreover, by delaying the clogging of the filter (1), the filter (1) is enabled to be used for a longer period of time without user intervention.

The actuation member (9) is in the form of a hollow cylinder. By means of the plurality of openings (12) on the actuation member (9), the water is directed to the entire filter (1) more homogeneously and efficiently than the case where the water enters the filter (1) through a single point (Figure 3).

The opening (12) is in the form of a quadrilateral with rounded corners. The filter (1) comprises four openings (12) which are arranged in a row in an aligned manner with a certain distance therebetween. There is a radial distance at a certain angle between each row of four openings (12). The width of the openings (12) is configured so as not to prevent the actuation member (9) from functioning as a worm screw.

The body (2) is cylindrical. The filter (1) comprises a plurality of windows on the side walls (13). Each window is covered with the filtering member (6). In the preferred embodiment of the present invention, the window is quadrilateral.

The base (3) is circular and covers the base of the body (2). The first bearing (10) extends on the base (3) so as to be perpendicular to the base (3), and the end of the actuation member (9) is attached to said first bearing (10). The actuation member (9) rotates around the first bearing (10).

The lid (4) and the receptacle (5) are circular. The receptacle (5) is formed on the side of the lid (4) facing the inside of the filter (1). The filter (1) further comprises a wall (14) which surrounds the receptacle (5). In the embodiment of the present

invention, the scraper (7), which moves towards the lid (4), pushes the waste particles collected and swept into the receptacle (5), and the scraper (7) enters the receptacle (5). The actuation member (9) passes through the center of the lid (4) and the receptacle (5). The lid (4) holds all components of the filter (1) together
5 and also enables the forming of a closed area like a receptacle (5) where the accumulated waste is collected.

In the embodiment of the present invention, the second bearing (11) passes through the center of the lid (4) and the receptacle (5) and extends into the filter (1) so as to be on the same axis as the first bearing (10). One end of the second
10 bearing (11) opens outside the filter (1) and the other end opens into the filter (1) towards the center of the actuation member (9). The end of the actuation member (9) is attached to the second bearing (11) and rotates on the first and second bearings (10 and 11) around the rotation axis on said first and second bearings (10 and 11).

15 The scraper (7) is circular and enables microfiber and similar waste particles accumulated on the surfaces of the filtering members (6) to be swept away as a result of the rotation of the actuation member (9). By turning the actuation member (9) clockwise or counterclockwise, the scraper (7) moves back and forth on the actuation member (9).

20 In an embodiment of the present invention, the filter (1) comprises a sealing member (8) which is disposed all around the edges of the scraper (7), which contacts the filtering members (6) from the inside of the filter (1) and which enables the surfaces of all the filtering members (6) to be scraped. In the preferred embodiment of the present invention, the sealing member (8) is a gasket.

25 In another embodiment of the present invention, the filter (1) comprises a step (15) which forms the base of the receptacle (5) on the side of the actuation member (9) inside the receptacle (5). When the actuation member (9) is separated from the lid (4), the step (15) moves away from the lid (4) and receptacle (5) together with the actuation member (9).

30 In another embodiment of the present invention, the lid (4), the receptacle (5) and the actuation member (9) form a single piece.

In the embodiment of the present invention, the filter (1) is used in a laundry washing machine, a laundry drying machine, a laundry washing/drying machine or a dishwasher.

In the embodiment of the present invention, by rotating the actuation member (9),
5 the sealing member (8) attached to the edges of the scraper (7) moves linearly in the filter (1) from the base (3) to the lid (4) while contacting the filtering member (6). During this movement, the waste particles retained by the filtering member (6) is scraped off the filtering member (6) by the scraper (7) and carried and swept towards the lid (4). By means of the sealing member (8), microfiber and similar
10 waste particles on the surface of the filtering member (6) are effectively swept away during the scraping process (Figure 4 and Figure 5). The water is taken into the actuation member (9) through the second bearing (11) and hence into the filter (1). The water flowing in the actuation member (9) passes through the openings (12) in the wall of the actuation member (9) to be distributed into the filter (1).
15 Thus, by means of both the scraper (7) and the water distributed by the actuation member (9), waste particles are scraped off the filtering member (6), swept towards the lid (4), collected in the receptacle (5), and bear against the step (15). In this case, the waste particles swept towards the receptacle (5) by the scraper (7) are compressed in the receptacle (5) between the scraper (7) and the step (15).
20 Afterwards, as the lid (4) is opened by the user, the step (15) and the actuation member (9) move away from the base of the receptacle (5) and the waste particles accumulated in the receptacle (5) and compressed by the step (15) are cleaned and the filter (1) is made ready for reuse (Figure 6 and Figure 7).

By means of the present invention, a simpler filter (1) is realized. Moreover, the
25 filtering efficiency is increased while ensuring that the surface of the filtering members (6) remain clean for a longer time. Furthermore, by means of the receptacle (5) wherein the waste cleaned off the surfaces of the filtering members (6) and turned into lumps is collected, the filter (1) can be easily cleaned without the user being required to contact the waste.

CLAIMS

1. A filter (1) **comprising** a body (2) which has a base (3) and side walls (13); a filtering member (6) which is provided on the side walls (13) of the body (2) and which filters the water; a first bearing (10) which extends perpendicular to the plane of the base (3); a lid (4) which is provided at the ceiling of the body (2); a second bearing (11) which extends perpendicular to the plane of the lid (4), which is connected to the water source at one end and which opens into the filter (1) at the other end, and which is positioned on the same axis as the first bearing (10) and an actuation member (9) which is in the form of a worm screw, which extends along the horizontal axis between the base (3) and the lid (4), which is borne on the first and second bearings (10 and 11) and which rotates around this axis, **characterized by** a scraper (7) which is disposed on the actuation member (9) and which enables the waste on the filtering member (6) to be scraped and transported as the edges thereof contact the filtering member (6); a receptacle (5) which is provided behind the lid (4) and wherein the waste carried by the scraper (7) is collected; and at least two openings (12) which are disposed along the actuation member (9) and which enable the water taken into the actuation member (9) through the second bearing (11) to be carried out.
2. A filter (1) as in Claim 1, **characterized by** the actuation member (9) which is in the form of a hollow cylinder.
3. A filter (1) as in Claim 1, **characterized by** the opening (12) which is in the form of a quadrilateral with rounded corners.
4. A filter (1) as in Claim 1 or Claim 3, **characterized by** four openings (12) which are arranged in a row in an aligned manner with a certain distance therebetween.
5. A filter (1) as in Claim 1, **characterized by** the body (2) which is cylindrical.

6. A filter (1) as in any one of the above claims, **characterized by** a plurality of windows which are provided on the side walls (13) and each of which is covered with the filtering member (6).
- 5 7. A filter (1) as in Claim 1, **characterized by** the base (3) which is circular and which covers the base of the body (2).
8. A filter (1) as in Claim 1, **characterized by** the receptacle (5) which is circular, which is formed on the side of the lid (4) facing the inside of the filter (1) and which comprises a wall (14) surrounding the receptacle (5).
- 10 9. A filter (1) as in Claim 1, **characterized by** the scraper (7) which is cylindrical.
10. A filter (1) as in Claim 1 or Claim 9, **characterized by** a sealing member (8) which is disposed all around the edges of the scraper (7), which contacts the filtering members (6) from the inside of the filter (1) and which enables the surfaces of all the filtering members (6) to be scraped.
- 15 11. A filter (1) as in any one of the above claims, **characterized by** a step (15) which forms the base of the receptacle (5) on the side of the actuation member (9) inside the receptacle (5).
12. A filter (1) as in any one of the above claims, **characterized by** the lid (4), the receptacle (5) and the actuation member (9) which form a single piece.
- 20 13. A filter (1) as in any one of the above claims, **characterized by** being used in a laundry washing machine, a laundry drying machine, a laundry washing/drying machine or a dishwasher.

1 / 4

Figure 1

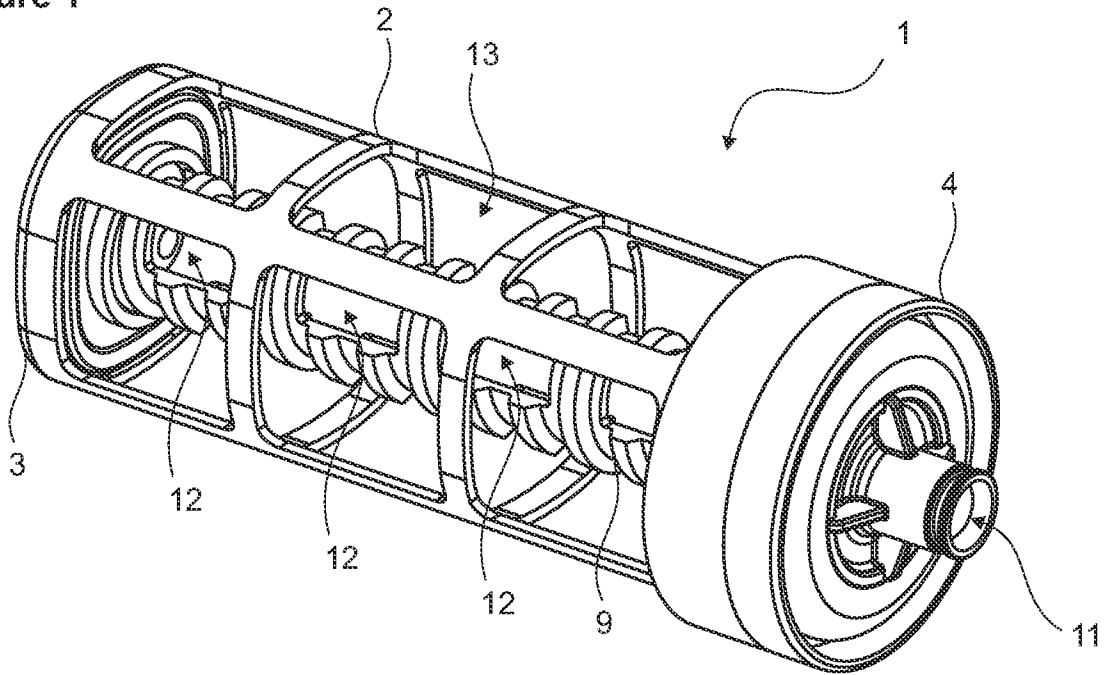


Figure 2

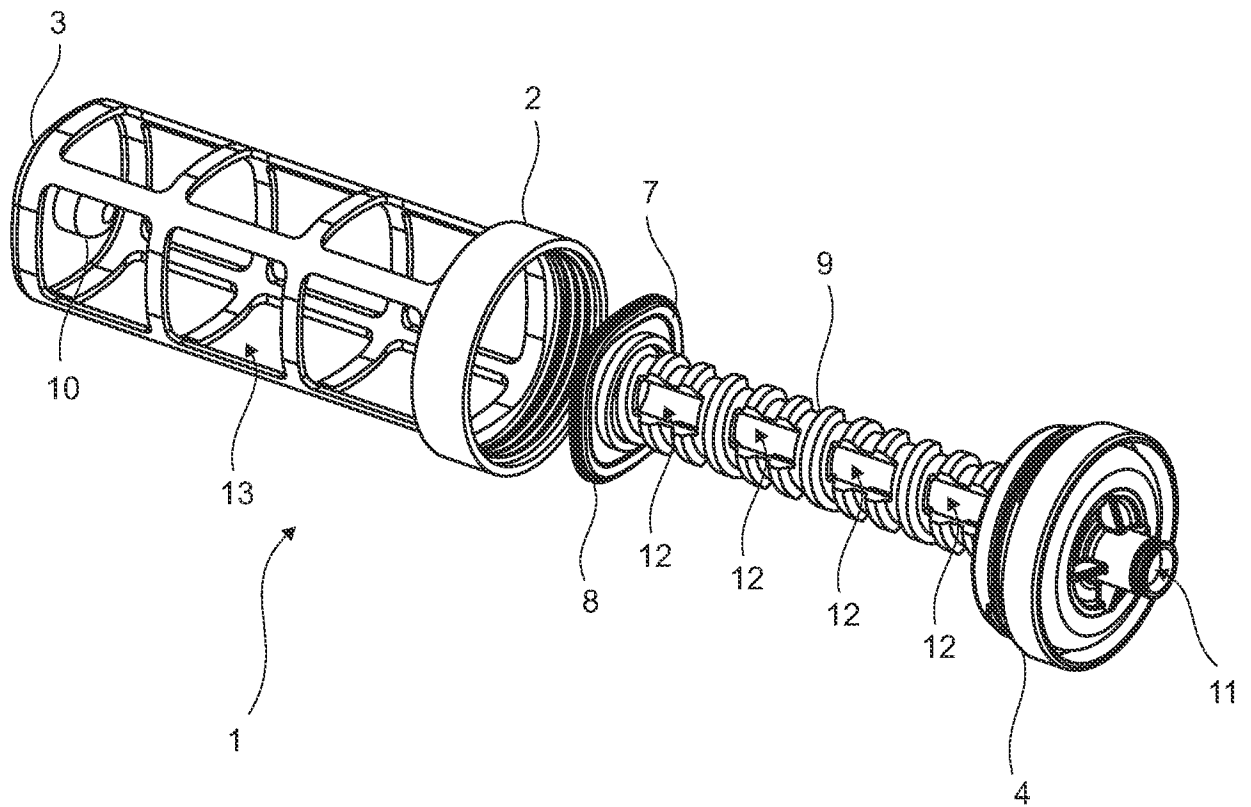


Figure 3

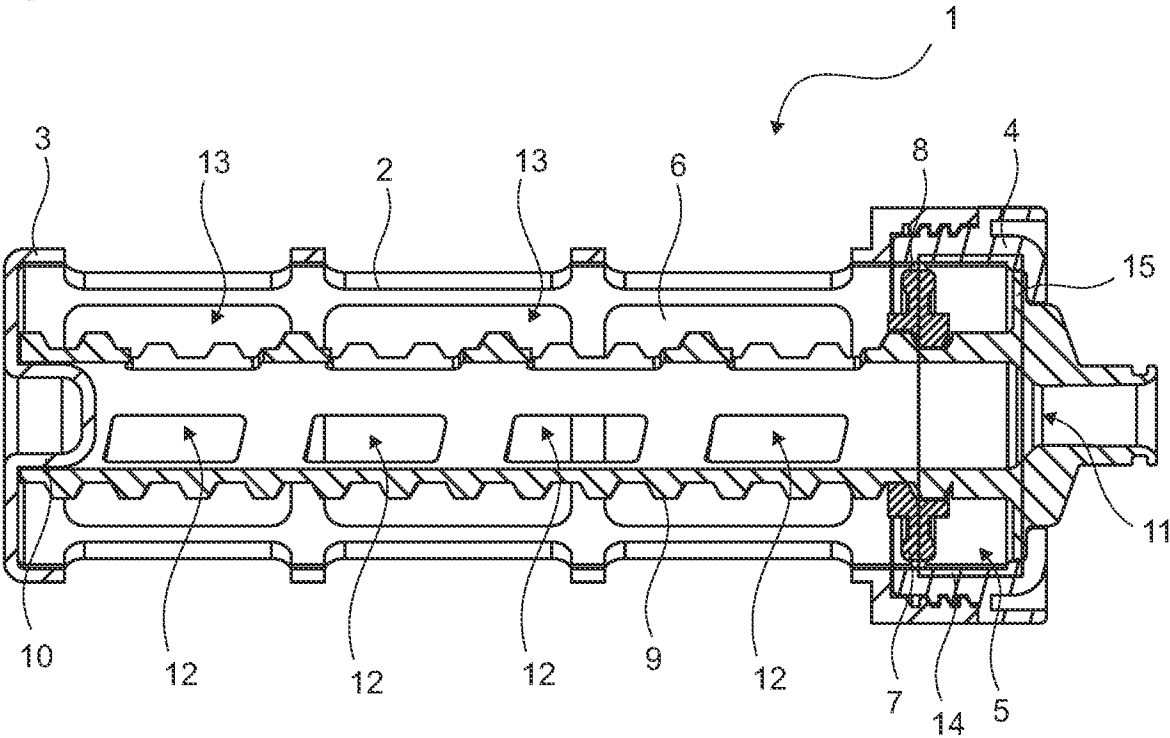


Figure 4

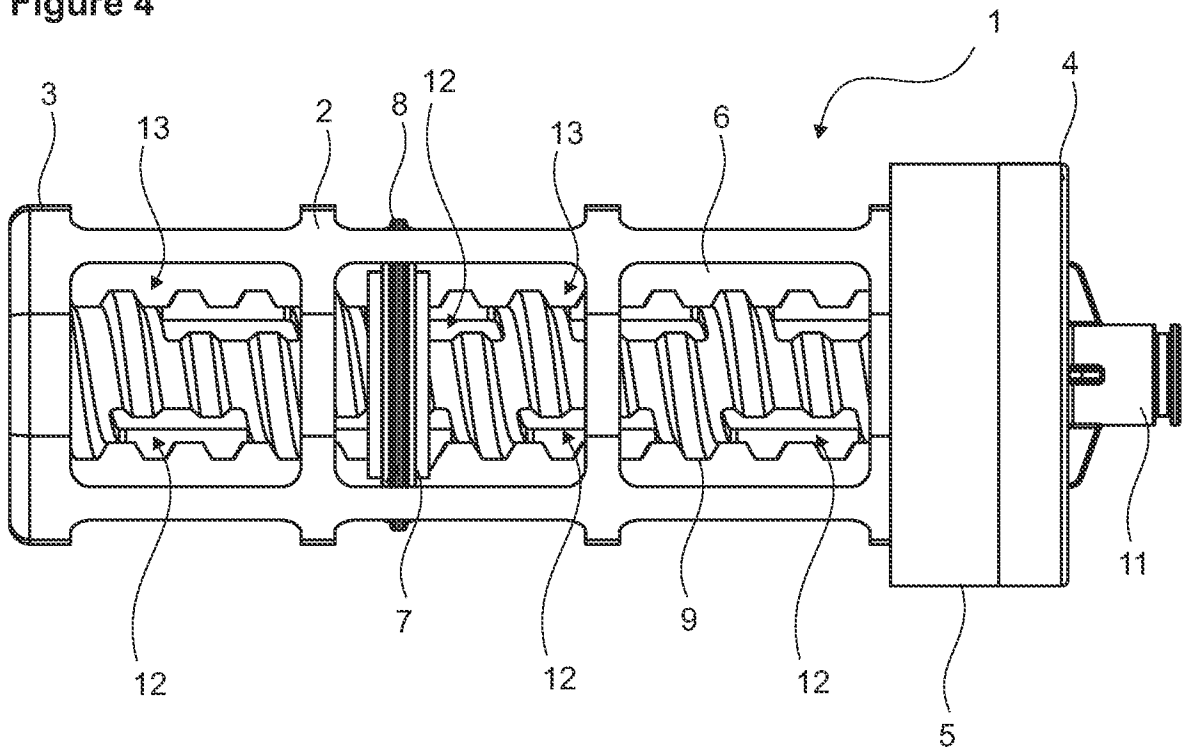
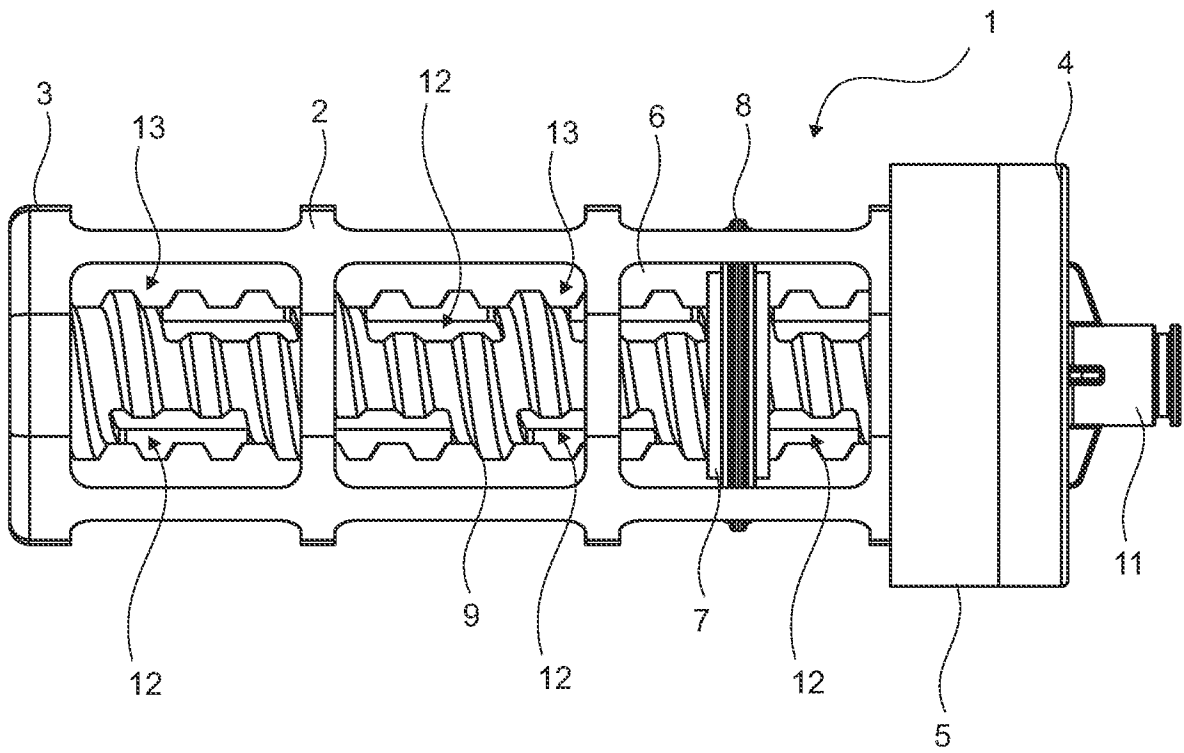


Figure 5



4 / 4

Figure 6

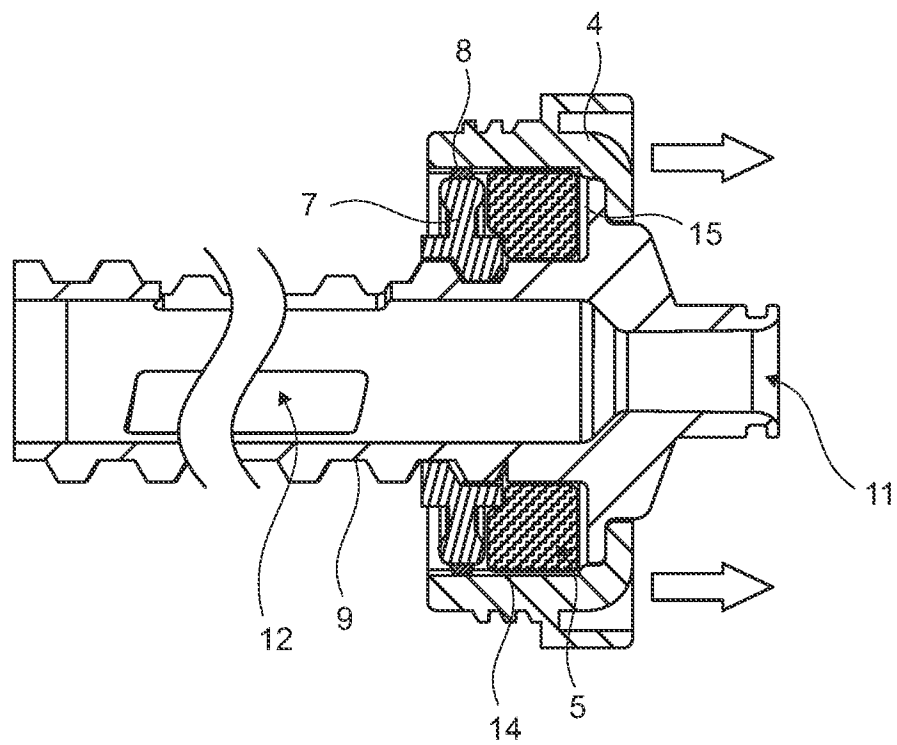
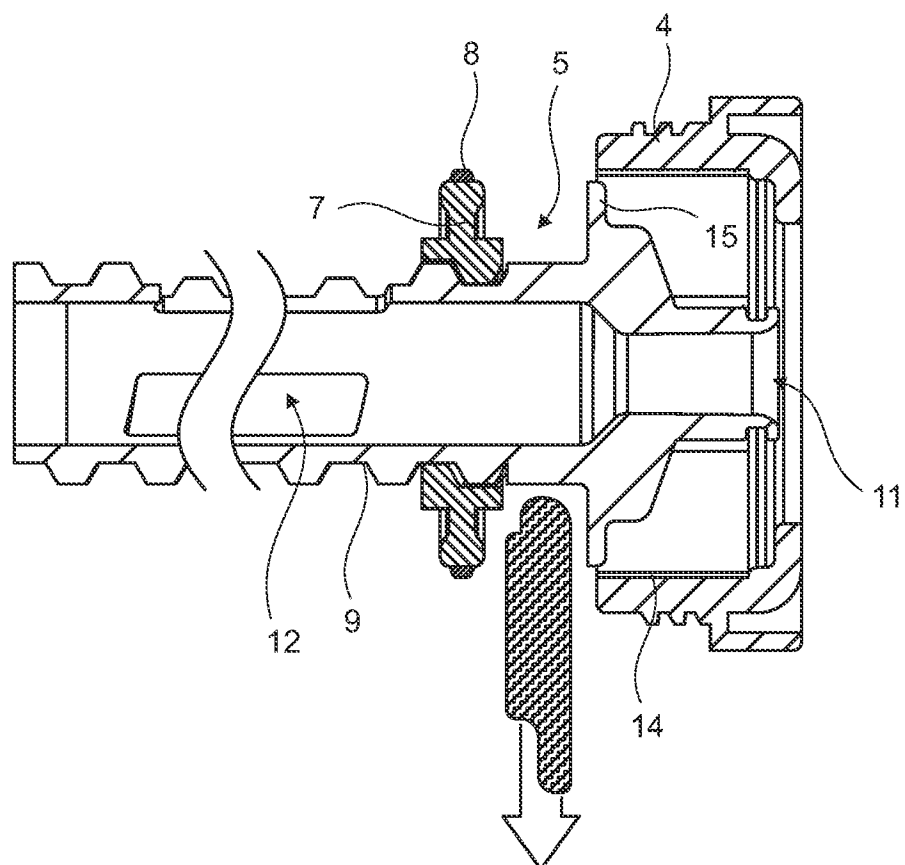


Figure 7



INTERNATIONAL SEARCH REPORT

International application No.

PCT/TR2024/050835

A. CLASSIFICATION OF SUBJECT MATTER B01D 29/00 (2006.01)i; B01D 29/21 (2006.01)i 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) B01D Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched TURKPATENT Database Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO Abstract & Fulltext Database		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 218627676 U (ZHEJIANG YAGUANG TECH CO LTD) 14 March 2023 (2023-03-14) Whole document	1-13
A	EP 3656420 A1 (GEMTIER MEDICAL JIANGSU INC [CN]) 27 May 2020 (2020-05-27) Whole document	1-13
A	WO 0112294 A1 (PUROLATOR PRODUCTS NA INC [US]) 22 February 2001 (2001-02-22) Whole document	1-13
A	US 2010276358 A1 (CUMMINS FILTRATION IP INC [US]) 04 November 2010 (2010-11-04) Whole document	1-13
☐ 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 “D” document cited by the applicant in the international application “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 24 September 2024		Date of mailing of the international search report 25 September 2024
Name and mailing address of the ISA/TR Turkish Patent and Trademark Office (Turkpatent) Hipodrom Caddesi No. 13 06560 Yenimahalle Ankara Türkiye Telephone No. +903123031000 Facsimile No. +903123031220		Authorized officer Kamer AYDINALP Telephone No. +903123031237

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/TR2024/050835

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN	218627676	U	14 March 2023	NONE	
EP	3656420	A1	27 May 2020	EP	3656420 A4 14 April 2021
				AU	2018302984 A1 27 February 2020
				AU	2018302984 B2 09 December 2021
				BR	112020000923 A2 21 July 2020
				CA	3070007 A1 24 January 2019
				CA	3070007 C 24 January 2023
				DE	212018000260 U1 21 February 2020
				JP	2020527460 A 10 September 2020
				JP	7048734 B2 05 April 2022
				KR	20200031125 A 23 March 2020
				KR	102461240 B1 28 October 2022
				PH	12020500146 A1 09 November 2020
				SG	11202000404X A 27 February 2020
				US	2021170098 A1 10 June 2021
				US	11344672 B2 31 May 2022
				WO	2019015523 A1 24 January 2019
				ZA	202000382 B 28 April 2021
WO	0112294	A1	22 February 2001	WO	0112294 B1 21 June 2001
				AU	6537700 A 13 March 2001
				BR	0013142 A 27 August 2002
				CA	2380946 A1 22 February 2001
				CA	2380946 C 29 March 2005
				DE	60010482 D1 09 June 2004
				DE	60010482 T2 12 May 2005
				DE	60010482 T3 02 February 2012
				EA	200200154 A1 29 August 2002
				EA	003489 B1 26 June 2003
				EP	1210164 A1 05 June 2002
				EP	1210164 B1 06 May 2004
				EP	1210164 B2 07 September 2011
				JP	2003507611 A 25 February 2003
				JP	4049586 B2 20 February 2008
				MX	PA02001526 A 21 July 2003
				US	6488845 B1 03 December 2002
US	2010276358	A1	04 November 2010	US	8517183 B2 27 August 2013
				BR	PI1014481 A2 05 April 2016
				CN	102483016 A 30 May 2012
				CN	102483016 B 06 May 2015
				CN	104832331 A 12 August 2015
				CN	104832331 B 18 August 2017
				US	2013306540 A1 21 November 2013
				US	9675909 B2 13 June 2017
				WO	2010129080 A2 11 November 2010
				WO	2010129080 A3 29 December 2010