

SELF CLEANING FILTER SYSTEM

FIELD OF THE DISCLOSED SUBJECT MATTER

The present disclosed subject matter relates to a self cleaning fluid filter system.

BACKGROUND OF THE DISCLOSED SUBJECT MATTER

5 Filtration systems are typically configured with a cleaning mechanism for removal of dirt and debris which typically accumulate over a surface of the filtration media of the filtration system.

Cleaning mechanisms offer scraping, rinsing by a jet of fluid emitted over the filter unit of suction applied thereto.

10 One such cleaning system is disclosed in US7,055,699 directed to a self-cleaning mechanical filter comprises a mechanism for simultaneously cleaning the internal surface and the external surface of a filter element. The filter is provided with structure for performing suction scanning of solid materials accumulated on the internal surface of the filter element, and structure which can be operated in synchronization
15 with the suction scanning structure for backwashing the external surface of the filter element during a self-cleaning process.

SUMMARY OF THE DISCLOSED SUBJECT MATTER

According to the presently disclosed subject matter there is disclosed a self cleaning fluid filter system configured with a flushing and backspraying assembly, said
20 system configured for initiating a self cleaning cycle manually or in a fully automated fashion.

According to the disclosed subject matter there is provided a fluid filtration unit comprising a housing accommodating a stationary cylindrical filter element, defining a

raw fluid chamber extending between an inlet of the housing and raw fluid face of the cylindrical filter element, and a filtered fluid chamber extending between a filtered fluid face of the filter element and an outlet from said housing; a flushing and backspraying assembly comprising at least one flushing arm coupled to a lower pressure source and
5 extending within the raw fluid chamber, and configured with a plurality of flushing nozzles disposed in close proximity with the raw fluid face of the filter element, and at least one backspraying arm coupled to a pressurized fluid source and extending within the filtered fluid chamber and configured with an array of backspraying nozzles disposed in close proximity with the filtered fluid face of the filter element; and a
10 driving mechanism for selectively imparting said flushing and backspraying assembly with rotary and linear motion.

The term *lower pressure source* as used herein the specification and claims refers to pressure at the flushing arm and indicates pressure lower than the raw fluid pressure, wherein said lower pressure source can be atmospheric pressure or vacuum.

15 Any one or more of the following features and designs can be configured with a self cleaning filtration unit according to the present disclosure, separately or in combinations thereof:

- The flushing nozzles and the backspraying nozzles are symmetrically disposed over both faces of the filter element such that opposite each flushing
20 nozzle there is disposed a corresponding backspraying nozzle;
- The flushing nozzles and the backspraying nozzles are coaxially and are disposed substantially normal to the respective raw fluid face and the filtered fluid face of the filter element;
- The flushing nozzles and the backspraying nozzles are disposed such that
25 their centerlines parallelly extend though offset disposed over the filter element;
- One or both of the flushing nozzles and the backspraying nozzles are disposed at an angle with respect to a radii of the cylindrical filtering element;
- One or both of the flushing nozzles and the backspraying nozzles are pivotally displaceable about a longitudinal axis extending substantially parallel
30 to a longitudinal axis of the filtering element;
- A controller is provided for initiating a self cleaning cycle depending on a specified time interval lapsed from a previous cleaning cycle;

- A controller is provided for initiating a self cleaning cycle depending on a predetermined volume of liquid passing through the filter;
- A controller is provided for initiating a self cleaning cycle depending on a predetermined maximum differential pressure DP between the raw fluid and the filtered fluid;
- Backwashing and flushing are simultaneously or selectively performed during a cleaning cycle;
- The backspraying arm with the articulated backspraying nozzles and the flushing pipe with the articulated flushing nozzles revolve simultaneously;
- The backspraying assembly further comprises a backspraying pipe coaxially extending with a flushing pipe, with a gap configured between the pipes such that there is created a tubular hollow space between an outer surface of the central backspraying pipe and an inner surface of the flushing pipe;
- The at least one backspraying arm is in fluid flow communication with the backspraying pipe and the at least one flushing arm is in fluid flow communication with the tubular hollow space;
- The backspraying assembly further comprises a connector element configured for supporting the at least one backspraying arm to the flushing pipe whilst providing a fluid flow path between the at least one backspraying arm and the backspraying pipe.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to understand the present disclosed subject matter and to see how it can be carried out in practice, embodiments will now be described, by way of non-limiting examples only, with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a self cleaning filter system according to the present disclosed subject matter, with portions of the housing made transparent for visualizing inside components of the filter;

Fig. 2 is a cutaway perspective view of the self cleaning filter of Fig. 1, with its upper elements removed for clarification, with portions of the housing made transparent for visualizing inside components of the filter;

Fig. 3A is a longitudinal cross sectional view of the self cleaning filter, taken along line III-III in Fig. 1;

Fig. 3B is a perspective exploded view of a driving mechanism of the self cleaning filter;

5 **Fig. 3C** is a longitudinal section of the lower portion of the self cleaning filter, schematically showing the flow paths within the self cleaning filter;

Fig. 4A is a perspective view of a flushing and backspraying assembly used in the self cleaning filter;

10 **Fig. 4B** is an exploded perspective view of the flushing and backspraying assembly of Fig. 4A;

Fig. 4C is a perspective view of a connector element within the flushing and backspraying assembly;

Fig. 4D is a section along line D-D in Fig. 4C;

Fig. 4E is a section along line E-E in Fig. 4C;

15 **Fig 5A** is a perspective view of a detail of a flanged endplate with upper flushing cell used in the self cleaning filter;

Fig 5B is a cutaway perspective view of the upper flushing cell seen in Fig. 5A;

Figs. 6A to 6D are planar, top sectional views through flushing nozzles and backspraying nozzles showing examples of different nozzle configurations; and,

20 **Fig. 7** is a chart illustrating differential pressure vs. time showing performance of a control sequence for the self cleaning filter.

DETAILED DESCRIPTION OF EMBODIMENTS

Referring to Figs. 1, 2, and 3A, there is illustrated a self cleaning filter system **1** according to the present disclosed subject matter, comprising a cylindrical housing **2** (made transparent in Figs. 1 and 2 for visualizing inside components of the filter) and configured with an inlet port **3** and an outlet port **4**. A smaller diameter cylindrical filter element **5** rests concentrically within the housing **2**, creating an outer space **6** (namely, a filtered fluid chamber) between an inside surface of the housing **2** and an outside surface of the filter element **5**. An inner space **7** (namely, a raw fluid chamber) extends within the cylindrical filter element **5**.

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It is appreciated that the filter element **5** can in fact be any type of filtering unit, e.g. disk-type, thread-type, screen-type, pile-type, and the like.

In the present example, the cylindrical housing **2** is hydraulically sealed at its top end by a flanged endplate **8** and at the bottom end by endplate **11**. Filter element **5** is
5 secured to endplate **11** using screws **10** extending from a top filter cover plate **9** to the endplate **11**. It is however appreciated that other forms of articulation of the filter element to the housing can be applied.

According to one example of the disclosed subject matter, inlet port **3** extends through as inlet pipe **25** communicates with the inner space **7** of the filter element **5**, and
10 outlet port **4** communicates with the outer space **6**. Unfiltered raw liquid is introduced through inlet port **3** (the flow path **70** is illustrated in Fig 3C by solid arrows) and enters inner space **7** within the filter element **5**. The raw liquid then passes through the filter element **5** and the resulting filtrate enters outer space **6** (flow path **71** is illustrated in Fig 3C by solid arrows) and is then discharged through outlet port **4**.

15 The self cleaning filter system **1** further comprises a flushing and backspraying assembly generally designated **13** (best seen in Figs. 2, 3A, 4A and 4B). The flushing and backspraying assembly **13** has a pipe-in-pipe configuration in which a central backspraying pipe **14** sits concentrically within a flushing pipe **15** with a gap between the pipes such that there is created a tubular hollow space between the outer surface of
20 the central backspraying pipe **14** and the inner surface of the flushing pipe **15**.

A plurality of flushing (suction) nozzles **16** laterally extend from the flushing pipe **15** via radially extending flushing arm assemblies **15A**, said flushing nozzles **16** extending in close proximity to the inner surface **5A** of the filter element **5** (i.e. a raw fluid face of the filter element) within the inner space **7** (seen in Figs. 3A and 3C). The
25 flushing and backspraying assembly **13** extends through a central aperture in the filter cover plate **9** to the outer space **6**.

A pair of backspray pipe arms **17** connect via screws, or other fasteners, to a connector element **19** (shown in detail in Fig. 4C), facilitating communication between the central backspraying pipe **14** and the backspraying arms **17**. The connector element
30 **19** further separates different pressure regions while simultaneously allowing communication between like pressure regions as will be described below. A plurality of backspraying (rinsing, jet emitting) nozzles **18** project (radially in the illustrated example) from the backspraying pipe arms **17** close to the outer surface **5B** of the filter

element **5** (i.e. a filtered fluid face of the filter element; best seen in Figs. 3A and 3C) and are positioned such that the backspraying nozzle outlets **50** are positioned directly opposite of corresponding flushing nozzle inlets **51**.

Whilst in the present example there are illustrated a pair of backspraying pipe arms **17** and a flushing pipe fitted with radially opposed flushing arm assemblies **15A**, it is appreciated that other configurations can be applied. For example, there may be one or three or any other practical number of backspraying pipe arms, with corresponding flushing arm assemblies radially projecting from a central flushing pipe or from several such flushing pipes.

It is however appreciated that the radial configuration of the flushing and backspraying assembly **13** as illustrated hereinabove is an example only, and other configurations are possible too, as discussed hereinafter with reference to Figs. 6A to 6D.

The bottom end of the flushing and backspraying assembly **13** resides concentrically within a flushing and backspraying cell assembly **20** (Figs. 2 and 3) which comprises another pipe-in-pipe arrangement with a backspraying cell pipe **22** concentrically residing within a flushing cell pipe **23**. The diameter of the backspraying cell pipe **22** is slightly larger than the diameter of the central backspraying pipe **14**, and the diameter of the flushing cell pipe **23** is slightly larger than that of the flushing pipe **15**, allowing insertion of the double pipe assembly of the flushing and backspraying assembly **13** within the double pipe of the flushing and backspraying cell assembly **20**.

Mechanical seals **26** at the upper edge of the flushing and backspraying cell assembly **20** protect against leakage at this insertion point to the inner space **7** of the filter element **5**, the seals **26**, however, allow for axial and rotational motion of the flushing and backspraying assembly **13** relative to the flushing and backspraying cell assembly **20**.

The flushing and backspraying cell assembly **20** is rigidly connected to an inlet **25** of the filter unit **1**, coupleable to a liquid line via a flanged portion thereof. The backspraying cell pipe **22** with a backspraying inlet port **21** has a radial pipe component **30** (Fig. 2) at the bottom of the flushing and backspraying cell assembly **20** and exits the inlet pipe **25** through a sealed aperture in the wall of the inlet pipe **25**. Similarly, a flushing cell drain pipe **28** with flushing outlet port **29** is rigidly connected to the

flushing cell pipe **23** and exits the inlet pipe **25** through a sealed aperture in the wall of the inlet pipe **25**.

In a self cleaning cycle, a control device, e.g. a control valve, (not shown) located downstream of the flushing outlet port **29** opens to atmospheric pressure. The hollow space between the flushing pipe **15** and the backspraying cell pipe **22** thus has a lower ('negative') pressure relative to the higher pressure liquid flowing through the inner space **7** of the filter element **5**, and thus suction is created at the opening of the flushing nozzles **16**. This suction draws particulates that have been deposited on to the inside surface **5A** of the filter element **5** during filtration, into the flushing pipe **15** to the flushing cell pipe **23**, through the flushing cell drain pipe **28** and exiting through the flushing outlet port **29**. The flushing flow path **73** and **73A** is illustrated in Fig. 3C by dashed arrows.

In a backwash phase of the self cleaning cycle, pressurized fluid, gas or liquid, (typically liquid) from downstream the filter unit (i.e. after being filtered) is pressurized e.g. by a pressure unit (not shown and/or by an external pressurized source of fluid, is introduced through backspraying inlet **21** and flows through radial pipe element **30** and into backspraying cell pipe **22**. The liquid then enters the flushing and backspraying assembly **13** through central backspraying pipe **14** (as seen in flow path **72** of Fig. 3C) it is directed via the connector element **19** into the backspraying arms **17** and is sprayed out of the backspraying nozzles **18** onto the outer surface **5B** of filter element **5**.

Another part of the self cleaning system comprises a driving mechanism **12** mounted above the flanged endplate **8** of the filter housing **2**. The driving mechanism **12**, as seen in Fig 3B, comprises a geared motor **31** that rotates a drive shaft **33**. The motor **31** can be electric or hydraulic type. The drive shaft **33**, which is a revolving screw, rests within a drive housing **32**. The drive shaft **33** connects at its bottom end via pin **35** to an axle **34** along a common longitudinal axis. As seen best in Figs. 3A and 4B, the axle **34** is aligned along the same longitudinal axis **X** as that of the central backspraying pipe **14** and connects to the top side of the connector element **19** via pin **36** thus creating a single rigid rotational transmission system between the driving mechanism **12** and flushing and backspraying assembly **13**.

During self cleaning operation, the geared motor **31** drives the drive shaft **33** which in turn transmits rotational and axial motion to the flushing and backspraying assembly **13** via its connection to the axle **34**, causing the flushing nozzles **16** and

backspraying nozzles **18** to rotate and axially reciprocate (move in an up and down direction) in a synchronized fashion, thus scanning substantially the entire inner surface **5A** and outer surface **5B** of the filter element **5**. The axial motion of the drive shaft is limited for example, by toggle switches **39** mounted to the drive housing **32** and drive shaft switch plate **38** as well as axle switch plate **42**. Also, the suction is continuous during combined revolving and reciprocal axial displacement of the flushing and backspraying assembly.

An upper flushing cell **43** (Fig. 5B) is rigidly connected via a flange **44** on its upper side to a flange **32A** of the drive housing **32** of the driving mechanism **12**, and on its bottom side is fixed, e.g. by welding over the flanged endplate **8**. Figs. 5A and 5B show the upper flushing cell **43** positioned over the flanged endplate **8** and a cutaway perspective view of the upper flushing cell **43** respectively. The upper flushing cell **43** comprises an external pipe **45** and inner pipe **46** which are concentric, each pipe affixed with a mechanical seal element **47** at the bottom of each pipe respectively. The space between the inner surface of the outer pipe **45** and the outer surface of the inner pipe **46** defines an upper flushing chamber **49**. The diameter of the outer pipe **45** is sized such that a flushing pressure pipe **40** (seen best in Figs. 4A and 4B) can be inserted within the outer pipe **45**, and the diameter of inner pipe **46** is sized such that a backspraying pressure pipe **41** (seen best in Figs. 4A and 4B) can be inserted within it, and together with mechanical seal elements **47** (Fig. 5B) create a seal between the insertion while allowing axial and rotational motion at the sealing points. The flange **44** has a center aperture **48** through which the flushing axle **34** passes. Flushing pressure pipe **40** and backspraying pressure pipe **41** the upper portion of the flushing and backspraying assembly **13** connecting directly to the connector element **19**.

In order to provide a balance of pressures exerted on the upper and lower portions of the flushing and backspraying assembly **13** during a self cleaning operation, the pressures within the upper flushing cell **43** and flushing and backspraying cell assembly **20** require balancing.

Figs. 4C to 4E show the connector element **19**. Thoroughgoing flushing bores **60** allow for high pressure fluid communication between the space within central backspraying pipe **14** and backspraying pressure pipe **41** and thus provide a balance of pressure in the backspraying regions defined by the space within backspraying cell pipe **22**, central backspraying pipe **14**, backspraying arms **17** (screw coupled to the connector

element **19** at **17A**) and backspraying pressure pipe **41**. Similarly, suction bores **61** allow for low pressure fluid communication between the space within flushing pipe **15** and flushing pressure pipe **40** providing a balance of pressure between the flushing regions defined by flushing cell pipe **23**, flushing pipe **15** along with flushing arm assemblies **15A** and flushing pressure pipe **40**. This axial pressure balance ensures that movement of the flushing and backspraying assembly **13** by means of the driving mechanism **12** will not be affected by the pressures within the flushing and backspraying regions, and thus axial forces exerted on the driving mechanism are balanced. Bores **19A** serve for rotatably coupling the connector element **19** with the articulated backspraying arms **17** to the axle **34**, by the coupling pin **36**.

Figs. 6A to 6D are directed to different configurations of each a cross section through a flushing and backspraying assembly **13**, showing several configurations of the current disclosed subject matter.

Fig. 6A is an example of the above described nozzle arrangement in which the center of backspraying arm **17** is co-linear (coaxial) with the centerline **Y** of flushing nozzles **16** such that that the plane of the flushing nozzle inlet **51** and the plane of the backspraying nozzle outlet **50** are parallel and directly opposed to each other, in a substantially radial configuration, i.e. substantially normal to the respective inside and outside surface of the filter element **5**.

Fig. 6B is an example of an arrangement of the flushing and backspraying assembly **13** such that center of backspraying arm **17** is parallel though offset from the centerline **Y** of the flushing nozzles **16** while the plane of the flushing nozzle inlet **51** remains parallel to the plane of the backspraying nozzle outlet **50** resulting an offset between the openings of the nozzles.

In another example, Fig. 6C shows an offset arrangement of the center of backspraying arm **17** relative to the centerline of the flushing nozzles **16** with the plane of the backspraying nozzle outlet **50** rotated at an angle α (i.e. intersecting) relative to the plane of the centerline **Y** of the flushing nozzle inlet **51**. The rotation angle is provided such that the backspraying nozzle outlet **50** points substantially toward the flushing nozzle inlet **51**.

Fig. 6D shows another example of an arrangement of the flushing and backspraying assembly **13** in which the center of backspraying arm **17** is co-linear with the centerline **Y** of flushing nozzles **16** while the plane of the backspraying nozzle outlet

50 is angularly reciprocal about the longitudinal axis **Z** of the backspraying arm **17**, for example by a hydraulic motor (not shown).

Operation of the cleaning cycle of the self cleaning filter can be fully automated. In one mode of operation backwashing and flushing can be performed simultaneously
5 during every cleaning cycle. Alternatively, only flushing or only backwashing can be performed (though the backspraying arm **17** with the articulated backspraying nozzles **18** and the flushing pipe **15** with the articulated flushing nozzles **16** revolve together). The cleaning cycle can be initiated based on a specified time interval, or initiated based on a predetermined volume of liquid passing through the filter, or by a predetermined
10 maximum differential pressure **DP** between the raw entering water and the filtrate leaving the filter or by combination thereof (a combination can include any two or more control parameters).. The length of time for the cleaning process can also be automated or preset, or monitored by sensors.

Fig. 7 is a chart displaying an example of an automated operation sequence for
15 the flushing and backspraying self cleaning filter 1. The chart displays recorded values of **DP** between the raw liquid before passing through the filter element and the filtrate after passing through the filter element. Particulates begin to accumulate on the filter inner surface and thus the **DP** increases as seen in section **A** of the chart. When this **DP** reaches a designated preset maximum value, the flushing cleaning process is initiated.
20 This cleaning mode as seen in section **B** of the chart can reduce the **DP** close to the initial value marked as horizontal line **52**. Section **C** shows **DP** value once again rising toward the preset maximum allowable limit with continued normal filtering operation. In section **D** the flushing cleaning process again occurs, in this stage however, the flushing process alone was unable to reduce the **DP** close to the initial value of
25 horizontal line **52**, and the **DP** remained at a higher value as seen by horizontal line **53**, the value of which can be preset, indicating that the flushing process alone was unable sufficiently clean the filter.

As filtration occurs in section **E** the **DP** reaches the maximum preset value, however since the previous cleaning cycle of Section **D** was unable to reduce the **DP**
30 below a preset high value of horizontal line **53**, backwashing cleaning process is initiated along with the flushing cleaning process as seen in section **F**, and the **DP** returns close to its initial value of horizontal line **52**. Filtration continues as seen in section **G**, and an additional backwashing and flushing operation is seen in section **H**.

Determination of cleaning cycle can also be based on time intervals as seen in the chart of Fig. 7. A specified time interval can be preset which will determine whether flushing cleaning alone occurs, or both flushing and backwashing occur. **T1** and **T2** are periods of time between cleaning cycles. The cleaning cycle following the longer time period
5 **T1** can be a flushing cleaning process alone, and the cleaning cycle following shorter time period **T2** can be both flushing and backwashing processes as preset by the user.

Whilst particular embodiments have been exemplified, it is to be appreciated that the disclosed subject matter is not limited thereto and other embodiments and modifications are possible too, *mutatis mutandis*.

10 For example, it is optional that the liquid inlet and outlet ports are reversed and likewise, the flushing and backspraying assembly can be configured such that the flushing nozzles are external to the filter element and the suction nozzles are internal, or vice versa.

In another example, flushing nozzles and suction nozzles can be fixed and the
15 filter element can be moved relative to the nozzles to provide scanning of the entire filter element. One particular example involves rotation of the filter element and reciprocal axial displacement of the flushing and rinsing nozzles, however as long as substantially full area scan of the filter element is obtained during a self cleaning process.

20 It is also appreciated that the configuration disclosed hereinabove is one option and however, a reverse flow configuration can be designed as well, wherein filtration of liquid through the filter element takes place either in an inside-outside direction (as disclosed hereinabove) or in a reverse direction, i.e. an outside-inside direction. According to such a configuration flow through the unit is reversed wherein the outlet **4**
25 now serves as an inlet port for raw fluid and the inlet port **3** now serves as an outlet for the filtered fluid. Accordingly, the outer space **6** receives the raw fluid and fluid is filtered as it flows through the filter element **5** into the inner space **7** and then out through port **3**. Respectively, the nozzles **18** are suction nozzles and the nozzles **16** are jet emitting nozzles, i.e. functioning oppositely than the disclosure in connection with
30 the previously disclosed example, however with appropriate fluid flow reversing changes as required, *mutatis mutandis*.

It is also appreciated that the whilst in the illustrated example the inlet port and the outlet port are perpendicular to one another, this is a mere example and other

configurations are possible too. For example, the inlet port and the outlet port can extend about parallel or even coaxial axes.

CLAIMS:

1. A fluid filtration unit comprising a housing accommodating a stationary cylindrical filter element, defining a raw fluid chamber extending between an inlet of the housing and raw fluid face of the cylindrical filter element, and a filtered fluid chamber extending between a filtered fluid face of the filter element and an outlet from said housing; a flushing and backspraying assembly comprising at least one flushing pipe coupled to a lower pressure source and extending within the raw fluid chamber, and configured with a plurality of flushing nozzles disposed in close proximity with the raw fluid face of the filter element, and at least one backspraying arm coupled to a pressurized fluid source and extending within the filtered fluid chamber and configured with an array of backspraying nozzles disposed in close proximity with the filtered fluid face of the filter element; and a driving mechanism for selectively imparting said flushing and backspraying assembly with rotary and linear motion.
2. A fluid filtration unit according to claim 1, wherein the flushing nozzles and the backspraying nozzles are symmetrically disposed over both faces of the filter element such that opposite each flushing nozzle there is disposed a corresponding backspraying nozzle.
3. A fluid filtration unit according to claim 1, wherein the flushing nozzles and the backspraying nozzles are coaxially and are disposed substantially normal to the respective raw fluid face and the filtered fluid face of the filter element.
4. A fluid filtration unit according to claim 1, wherein the flushing nozzles and the backspraying nozzles are disposed such that their centerlines parallelly extend though offset disposed over the filter element.
5. A fluid filtration unit according to claim 1, wherein one or both of the flushing nozzles and the backspraying nozzles are disposed at an angle with respect to a radii of the cylindrical filtering element.
6. A fluid filtration unit according to claim 1, wherein one or both of the flushing nozzles and the backspraying nozzles are pivotally displaceable about a longitudinal axis extending substantially parallel to a longitudinal axis of the filtering element.
7. A fluid filtration unit according to claim 1, wherein a controller is provided for initiating a self cleaning cycle depending on a specified time interval lapsed from a previous cleaning cycle.

8. A fluid filtration unit according to claim 1, wherein a controller is provided for initiating a self cleaning cycle depending on a predetermined volume of liquid passing through the filter.
9. A fluid filtration unit according to claim 1, wherein a controller is provided for
5 initiating a self cleaning cycle depending on a predetermined maximum differential pressure **DP** between the raw fluid and the filtered fluid.
10. A fluid filtration unit according to claim 1, wherein backwashing and flushing are simultaneously or selectively performed during a cleaning cycle.
11. A fluid filtration unit according to claim 1, wherein the backspraying arm with
10 the articulated backspraying nozzles and the flushing pipe with the articulated flushing nozzles revolve simultaneously.
12. A fluid filtration unit according to claim 1, wherein the backspraying assembly further comprises a backspraying pipe coaxially extending with a flushing pipe, with a gap configured between the pipes such that there is created a tubular hollow space
15 between an outer surface of the central backspraying arm and an inner surface of the flushing pipe.
13. A fluid filtration unit according to claim 12, wherein the at least one backspraying arm is in fluid flow communication with the backspraying pipe and the at least one flushing arm is in fluid flow communication with the tubular hollow space.
- 20 14. A fluid filtration unit according to claim 12, wherein the backspraying assembly further comprises a connector element configured for supporting the at least one backspraying arm to the flushing pipe whilst providing a fluid flow path between the at least one backspraying arm and the backspraying pipe.