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(71) Applicant *(for all designated States except US)*: **AMIAD WATER SYSTEMS LTD.** [IL/IL]; Kibbutz Amiad, 12335 D.N. Upper Galil 1 (IL).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **OLENBERG, Marina** [IL/IL]; 9 Menahem Begin Street, 11631 Kiryat Shmona (IL). **ZUR, Boaz** [IL/IL]; Kibbutz Parod, 20110 DN Bikat Beit Hakerem (IL). **TAL, Ronen** [IL/IL]; Kibbutz Shamir, 12135 D.N. Galil Elyon (IL). **ESHEL, Gonen** [—/IL]; Kibbutz Snir, 12250 DN Galil Elyon (IL).

(74) Agent: **REINHOLD COHN AND PARTNERS**; P.O. Box 13239, 61131 Tel Aviv (IL).

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(54) Title: FILTRATION UNIT AND SYSTEM

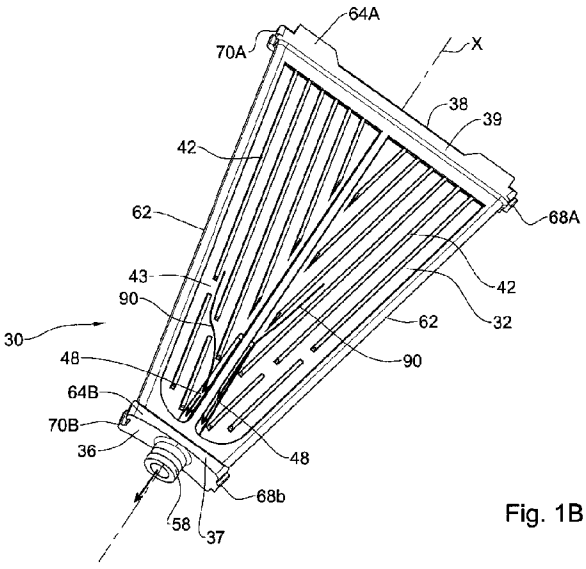

Fig. 1B

(57) Abstract: A filtration cassette having a rigid body configured for externally supporting a filtration media disposed thereover and having at least one filtering surface configured with a flow path facilitating filtered fluid flow from a space extending between the filtration media and the filtering surface, and extending towards an outlet terminal. There is also provided a filtration segment comprising such a filtration cassette and where the filtration media is a filtration thread tensionally coiled over the filtration cassette at a multi-layered and tight configuration. A plurality of such filtration segments are configured into a disk-type assembly forming a filtration unit for a filtering system.

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FILTRATION UNIT AND SYSTEM

FIELD OF THE PRESENT DISCLOSED SUBJECT MATTER

The present disclosed subject matter relates to filtration units and filtration systems making use of same. The present disclosure is further concerned with a filtration method using filtration units and filtration systems of the specified type, and methods for rinsing the filtration units.

BACKGROUND OF THE PRESENT DISCLOSED SUBJECT MATTER

Disk filters, at times referred to also as *plate filters*, are well known and are in use for many years.

A disk filter system typically comprises a plurality of parallely disposed discs, each composed of a plurality of filtering segments (sectorial segments, trapezoidal segments, or otherwise shaped), coupled together to form a disk-shaped filtration element.

Examples of disk filters are disclosed in Canadian Patent publication CA 2510282A disclosing a filter sector for a disc filter, said sector having a root and a tip with a plurality of radial supports extending there between, each of said supports having a channel section with opposed walls diverging said tip to said root, said radial supports being interconnected by lateral members to define a pair of oppositely directed faces to support a filter membrane.

A further disk system is disclosed in WO 2006/084858 directed to a static plate filter with a continuous flow for the filtering of liquids comprising a set of static filtrating plates with a filtering fabric, a central fissured tube with a cavity section for

the evacuation of the filtered liquid, a waterproof aspiration chamber, a rotating cleaning device for the regeneration of the plates, with a header which rotates around the aspiration chamber with which it is in direct contact, on which are coupled fissured tubes for the cleaning and aspiration of the filtering fabric, where the fissured tubes of the rotating cleaning device stick to the filtering fabric and their position in such that it guarantees the cleaning of the adjacent faces of two near plates.

A particular filtering media is disclosed in an article entitled [Real World Performance and Low Cost Operation Maximizes Benefits of Disc-Type Filtration], by Siemens Water Technologies, available at:

http://www.water.siemens.com/SiteCollectionDocuments/Product_Lines/Davis_Products/Brochures/BC-FORTYX3-BR-0809.pdf (last accessed on September 29, 2011).

SUMMARY OF THE PRESENT DISCLOSED SUBJECT MATTER

Filters in accordance with the disclosed subject matter can be used for filtering different fluid media, including gaseous material and different liquids such as fresh water, irrigation water, contaminated water including sewage, emulsions, sea water, viscous liquids, with the range of fluid pressure and other parameters thereof being substantially unlimited.

The term *fluid* is thus defined hereinafter as any flowable matter, i.e. gas or liquid, regardless its purpose, degree of contamination, particle size, viscosity, pressure or any other parameters. Hence, herein in the specification and claims the term fluid is used in its broadest sense.

It is an object of the present disclosed subject matter to provide a filtering segment and a filtration cassette therefore, for use in conjunction with a disk-type filtration system.

It is another object of the present disclosed subject matter to provide a disk-type filtration system configured with filtration segments according to the present disclosed subject matter.

It is yet an object of the present disclosed subject matter to provide a rinsing system for a disk-type filtration system.

A filtration segment according to the disclosed subject matter comprises a filtration cassette configured as a rigid body externally supporting a filtration media

disposed thereover and having at least one filtering surface configured with a flow path facilitating filtered fluid flow from a space extending between the filtration media and the filtering surface, and extending towards an outlet terminal.

The filtration media, according to a particular design is a thread tensionally coiled (wrapped) over the filtration cassette unit at a multi-layered and tight configuration. The thread is substantially continuous. The tension of the coiled (wrapped) thread can vary about the longitudinal axis of the filtration cassette and/or between wrapping layers. The filtration media can be composed of a thread, continuous or not, with an altering thickness.

According to an embodiment of the disclosed subject matter, the thread filter media is wrapped about a longitudinal axis of the filtration cassette.

The filtration cassette, according to one particular configuration, is a flat, trapezoidal structure, such that an array of like filtration cassettes can be assembled into a near-to-circular, disc-like filtering assembly.

The filtering surface is configured with a plurality of ribs projecting from the surface for supporting the filtration media and facilitating fluid flow through the flow path, over the surface and between the plurality of ribs. The flow path extends over the filtering surface of the filtration cassette and then extends into a collecting duct within the rigid body (through the filtering surface) and further towards the outlet terminal.

The filtration cassette is configured for assembly in a radial setup to a filtered fluid collecting duct. Coupling to the collecting duct is facilitated through a coupler of the outlet terminal (which according to a particular design extends along the longitudinal axis of the filtration cassette), configured for articulation to the collecting duct and being in flow communication therewith, wherein assembly of such filtration cassettes in a juxtaposing configuration gives rise to the disc-like filtering system.

The coupler can be tubular member configured for press-fit into a corresponding receptacle at the fluid collecting duct, in fluid tight fashion.

The filtering surface can be flat or can be configured with a concaved cross-section. A centerline of the concavity extending substantially parallel to the longitudinal axis of the filtration cassette.

The filtration cassette can be made of a plastic molded material with both filtration surfaces being substantially same.

The filtration cassette is configured at a distal end thereof with an arresting portion for securing at an assembled position to thereby prevent spontaneous detaching from a collecting duct of a filtration system. The arresting portion can be in the form of a band-receiving groove configured at a rear end of the filtration cassette.

According to yet an aspect of the disclosed subject matter there is provided a disk-like filtering unit configured with an array of filtration segments of the aforementioned type, said filtration segments being coupled into a filtered fluid collecting duct of the filtering system for providing filtered fluid. Further there is provided a rinsing mechanism for rinsing the filtration cassettes.

Filtration segments of a filtering unit are secured to thereby prevent their spontaneous detaching from the collecting duct. Securing can be configured by a band radially packing the filtration segments, or by a coupler arrangement between neighboring filtration segments.

According to a particular design, the filtering system comprises a plurality of parallely extending fluid jet emitting arms, with at least one jet emitting nozzle juxtaposing and facing a filtration media of a filtration cassettes of the disk-like filtering units, and configured for selectively emitting a jet of rinsing fluid over the filtration media.

A rinsing mechanism according to the disclosed subject matter, for a disk-type filtration system, comprises at least one fluid jet emitting arm juxtaposed and facing a filtration media of a filtration cassette, and configured for selectively emitting a jet of rinsing fluid over the filtration media. According to one example the at least one jet emitting arm is fitted with an array of jet nozzles disposed along its length and facing the filtration media, and whereby disc-like filtering units are rotationally displaceable about a central axis thereof, whereby a rinsing fluid jet is applied substantially over the entire surface of the filtration media as they rotate with respect to the jet emitting arms.

According to another configuration, the rinsing mechanism comprises one or more jet emitting arms, each fitted with one or more jet nozzles near a distal end of the one or more arms and wherein the arms are configured for reciprocal pivotal displacement (in a turntable-arm resembling fashion) over the filtration media of the disc-like filtering units, and whereby the disc-like filtering units are rotationally displaceable about a central axis thereof, whereby a rinsing fluid let emitted from the jet nozzles substantially rinses an entire face of a filtration segment. According to a

particular design, the jet emitting arms are pivotally disposed near a periphery of the filtration cassettes.

Rotation of the disc-like array of disc-like filtering units and/or manipulating motion of the one or jet emitting rinsing arms of the rinsing mechanism is facilitated by any type of motion generating mechanism, such as an electric motor, a hydraulic motor, pneumatic actuators, etc., and combinations thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to understand the present disclosed subject matter and to see how it may 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. 1A is a planar view of a filtration segment in accordance with the first aspect of the present disclosed subject matter;

Fig. 1B is a front perspective view of a filtration cassette unit used in the filtration segment of Fig. 1A;

Fig. 1C is a rear perspective view of Fig. 1B;

Fig. 1D is a top planar view of Fig. 1B;

Fig. 2A is a section along line I-I in Fig. 1C;

Fig. 2B is a section along line II-II in Fig. 1C;

Fig. 2C is a longitudinal section along line III-III in Fig. 1C;

Fig. 3A is a longitudinal section along line V-V in Fig. 1A;

Fig. 3B is an enlargement of the portion marked B in Fig. 3A;

Fig. 3C is a sectioned view at enlarged scale, of a portion taken along line IV-IV in Fig. 1A;

Fig. 4 is a perspective view of a disk-like filtering unit composed of a plurality of filtration segments seen in figure 1A;

Fig. 5A is a front perspective view of a filtering system in accordance with a configuration of the present disclosed subject matter;

Fig. 5B is a rear perspective view of Fig. 5A;

Fig. 6A illustrates the filtering tem of Figs. 5A and 5B with several components removed for clarification;

Fig. 6B illustrates the filtering unit of Figs. 5A and 5B with disk-like filtering units removed for clarification;

Fig. 6C is an exploded view of the filtering system of Figs. 5A and 5B;

Fig. 7 is a rinsing mechanism in accordance with an example of the present disclosed subject matter, suitable for use with a filtering system of the disclosed subject matter;

Figs. 8A to **8F** illustrate different views and close-ups of a filtration assembly accommodating a filtering system in accordance with an example of the disclosed subject matter, wherein:

Fig. 8A is a perspective, partially cutout view of the filtration assembly;

Fig. 8B is an enlargement of the portion marked B in Fig. 8A;

Fig. 8C is a schematic end view of the filtration assembly;

Fig. 8D an enlargement of the portion marked D in Fig. 8C;

Fig. 8E is a view of the filtration assembly illustrating fluid flow scheme;

Fig. 8F is an exploded view of the filtration unit and rinsing mechanism;

Fig. 9 is a perspective view of a rinsing mechanism in accordance with a different example, for use in conjunction with a filtering system in accordance with the disclosed subject matter;

Fig. 10A is a perspective view of a rinsing mechanism in accordance with the example of Fig. 9, with its left support mechanism removed for clarification;

Fig. 10B is a bottom perspective view of Fig. 10A;

Fig. 10C is a section along line X-X in Fig. 10A; and

Fig. 10D is a perspective view of the rinsing mechanism of Fig. 10A, sectioned along inclined line XI-XI in Fig. 10A.

DETAILED DESCRIPTION OF EMBODIMENTS

In Fig. 1A of the drawings there is illustrated a filtration segment generally designated **20**, in accordance with a first aspect of the present disclosed subject matter, useful as a filtering component in a filtering unit in accordance with further aspects of the present disclosed subject matter, and as will be discussed hereinafter in further detail.

The filtration segment **20** comprises a filtration cassette **30** seen in further detail in Figs. 1B to 1D, 2A to 2C and 3A to 3C. The filtration cassette **30** is a substantially flat, trapezoidal structure which in the present example is a plastic molded article and is

thus durable and light weight. The filtration cassette **30** comprises a top filtering surface **32** and a bottom filtering surface **34** extending between a narrow, front base **36** and a wider, rear (distal) base **38,** and defining together a trapezoidal shape extending about a longitudinal axis **X**. The structure of the filtration cassette **30** is reinforced by laterally exuding end portions **37** (at the front end) and **39** (at the rear end), rendering the structure twist resistance and bending resistance, and further serving to pack the thread filtering media, as illustrated in Fig. 1A.

Each of the top filtering surface **32** and bottom filtering surface **34** is substantially flat and comprises a plurality of longitudinal ribs **42** obliquely oriented with respect to the longitudinal axis **X** and projecting from the respective filtering surface **32** and **34** and defining together a flow path (designated by arrowed lines **90**) directing fluid flow towards apertures **48** formed near the front end **36** of the support unit **30**. The apertures **48** are through-going over the top and bottom filtering surfaces **32** and **34** and defining together a flow path extending between the ribs **42**, into the openings **48** and into a collecting duct **52** (best seen in Fig. 2C). The collecting duct **52** extends coaxial with the longitudinal axis **X**, from which the flow path extends into a coupler **58** coaxially projecting from the front base **36** and configured for coupling to a central collecting line (constituting part of the filtering assembly; in the form of a filtered fluid collecting duct , namely a cylindrical pipe **108** in Fig. 6A). Some of the longitudinal ribs **42** are interrupted along their length to facilitate fluid flow therebetween. Coupler **58** is typically configured with a groove receiving a sealing O-ring (not shown).

It is further noted that the longitudinal left and right edges **62** of the filtration cassette unit **30** are rounded and further, that the front base **36** and the rear base **38** project beyond said side edges **62** and above the filtering surfaces **32** and **34** as well as above the respective longitudinal ribs **42**. This arrangement guaranties that a wrapped (coiled) pack of filtration thread **55** (Figs. 1A, 3A and 3B) substantially does not project beyond a top-most surface **64A** of the rear base **38** or a top-most surface **64B** of the front base **36**, or beyond a bottom-most surface of the rear base **38** or of a bottom-most surface of the front base **36**, respectively, nor beyond a lateral male projection **68A** (at the rear base **38**) or **68B** at the front base **36**, or of a lateral female projection **70A** at the rear base **38** or **70B** at the front base **36**, the purpose of said lateral projections to become apparent hereinafter.

Thus, it is appreciated, and as can be seen in Figs. 1A and 3A and 3B, that the filtration media in the form of a pack of wrapped filtration thread **55**, does not exceed any of said boundaries whereby it is protected and thus prevented from damage.

It is further noted that the lateral male projections **68A** and **68B** are configured for receiving and engagement by corresponding female lateral projections **70A** and **70B** respectively, as can be seen in the disk-like filtering unit generally designated **80** in Fig. 4, composed of a plurality of planar disposed like filtration cassettes **30**. The disk-like filtering unit **80** is maintained in its tight planar configuration of Fig. 4 by means of an arresting portion in the form of a band **82** received within a band-receiving groove **84** formed at the rear base **38** of each filtration cassette **30** (said groove **84** may in fact extend between a pair projections **86** at the rear base) the band **82** may be an elastic band or a band of other nature secured in place by a latch **88**.

As illustrated in the drawings, the flow path extends under the filtration media 9i.e. the wrapped filtration thread **55**) between the filtering surfaces **32** and **34** along the arrowed lines designated **90**. Thus, it is apparent that the flow path extends between the filtering surfaces **32** and **34** and the bottommost layer of the wrapped thread **55**, however between the ribs **44** which are configured so as to facilitate fluid flow and direct it towards the apertures **48** (and for that purposes some of the ribs **42** are interrupted at several locations indicated **43**).

Whilst in the illustrated example hereinabove the top filtering surface **32** and bottom filtering surface **34** are substantially parallel to one another, other forms are configurable. For example, one or both of the top filtering surface and bottom filtering surface can be concave or convex (not shown). Furthermore, the filtration cassette may have other than trapezoidal shape, e.g. rectangle and the like.

With further attention being now made to Figs. 5 and 6 of the drawings there is illustrated a filtering system generally designated **100**, comprising an array of parallely disposed disk-like filtering units **80** (of the type disclosed hereinafter and discussed in connection with reference to Fig. 4) and used within a filtration assembly, e.g. filtering assembly **204** in Figs. 8.

Filtering system **100** comprises a pack of several disk-like filtering units **80**, wherein the disk-like filtering units **80** extend parallel to one another along a common central axis **Y**, and are secured over a central filtering fluid collecting duct (pipe) **108** which as can be seen in Fig. 6A is formed with a plurality of receptacle openings **112**

into which the coupler **58** (Fig. 1A) of each of the filtering cassettes **30** fits, typically by press fit, in a fluid-sealed fashion (an O-ring is fitted over the coupler) and are further secured and prevented from disengaging or displacement by means of the band **82**, as discussed in connection with Fig. 4. Thus, each filtration cassette **30** is in flow communication with the inside space **116** of the filtered fluid collecting duct **108** through the respective coupler **58**, wherein filtered fluid flows into said space **116** and as will be discussed hereinafter in connection with Figs. 8 is then collected and transferred for use.

The filtering system **100** further comprises a pair of disc-like end plates **120** securely mounted over the central fluid collecting pipe **108** and are pressingly secured by a pair of locking fasteners **122** securely coupled over the collecting pipe **108**.

The end plates **120** further support a rinsing mechanism generally designated **138** (removed from its seat **139** in Fig. 6A; said rinsing mechanism **138** being one of two examples as will be discussed hereinafter in further detail). It is also noted that the rinsing mechanism **138** is configured with a rinsing fluid inlet port **140**.

The filtering system **100** can be a single item within a filtration assembly, or it can be part of an array of like filtering units wherein such filtering units coaxially coextend (along the **Y** axis) with fluid flow extending between the respective filtered fluid collecting ducts **108** and also between neighboring rinsing mechanisms **138** through pipe segments **140** extending into a respective coupling end **142** at an opposed end thereof (Fig. 5A). For coupling to neighboring coaxial filtering units, the fluid collecting ducts **108** may project beyond one or both of the end supports **120**, or an extension pipe segment **127** may be coupled thereto via fasteners **122** (see Fig. 6C). however, a plurality of filtration system can be configured also in parallel relation, with suitable collecting pipes extending therebetween (not shown).

Owing to the nature of the filtering system **100**, namely its assembly of a plurality of adjoining disk-like filtering units **80**, there is the need to provide a cleaning mechanism competent for rinsing the filtering media, namely the coiled threads in between the disk constructions. For that purpose, a rinsing mechanism is provided, as illustrated in Figs. 5 and 6. A first example of a rinsing mechanism will be discussed hereinafter with reference to Figs. 7 and 8 of the drawings and generally designated **200**.

Rinsing mechanism **200** comprises a solid support block **202** secured to the housing **208** of the filtering system **204** (or to the end plates **120**) and comprises a rinsing fluid inlet port **210** extending from the housing **208** and into a rinsing fluid distribution line **212**, from which radially extend a plurality of jet emitting arms **216** and **218** (their configuration best seen in Fig. 7), arranged in two offset rows such that the arms **216** of one row alternate the arms **218** of the other row, wherein the arms are so mounted that their free ends extend towards the filtered fluid central collecting pipe **108** of the filtering system, at a substantial radial orientation. Each of the jet emitting arms **216** and **218** is configured with a plurality of jet emitting nozzles **220** facing the filtration cassettes **20** of the disk-like filtering assemblies **80** (i.e. configured for emitting rinsing fluid in the axial direction). The distribution of the jet emitting nozzles **220** is configured for covering substantially the entire surface of the filtering media.

In the particular example the rinsing mechanism **200** is a static mechanism wherein the disk-like filtering units **80**, mounted over the central collecting pipe **108** are rotatable (arrow **235** in Fig. 8C) by motor **255**, whereby rotating the filtering unit **100** whilst applying a rinsing fluid through the jet emitting arms **216** and **218** results in rinsing/cleaning of the filtering cassettes **30**.

Notable, rotation of the disc-like array of disc-like filtering units is facilitated by any type of motion generating mechanism, such as an electric motor, a hydraulic motor, pneumatic actuators, etc., and combinations thereof.

In the illustration of Fig. 7 the housing **202** comprises a single rinsing fluid distribution line **212** whilst in the illustrations of Figs. 8A to 8F there are provided two fluid distribution lines **212A** and **212B**, each associated with a row of arms **216** and **218** respectively, however both are in fluid communication with the rinsing fluid's inlet port **210**.

The rinsing mechanism **200** of Fig. 7 is further configured with a controlled rinsing fluid distribution system **217** with a plurality of flow control gates **219**, each being in flow communication with the rinsing fluid distribution line **212** and with a respective rinsing arm **216** and **218**, whereby a hydraulic/pneumatic/electric or combined controller opens/closes the control gates **219** to facilitate rinsing fluid to the respective rinsing arm.

With reference to Fig. 8E there is illustrated the filtration assembly **204** configured with a raw fluid inlet port **240** connectable to a supply of raw fluid (not

shown) and extending into the inner filter space **242**. The plurality of disk-like filtering units **80** are fitted over the fluid collecting pipe **108** in a fluid tight manner, wherein said pipe **108** extends into a filtered fluid collecting chamber **244** configured with a filtered fluid outlet port **246** connected to a consumption pipe (not shown). The housing **208** of the filtration assembly **204** is further fitted with a rinsing fluid inlet port **210**, which as explained hereinabove, is in flow communication with the rinsing fluid distributor line **212**, which in turn is in flow communication with the plurality of jet emitting arms **216** and **218** alternatingly distributed between neighboring disk-like filtering assemblies **80**. The central space **242** of the filtering system **204** is further configured with a rinsing/flushing fluid outlet port **250**.

The arrangement is such that during a filtering process the rinsing fluid inlet port **210** and the flushing outlet port **250** are shut whilst raw fluid enters the filtration assembly through inlet port **240**, flows through the plurality of filtration segment **20** of the disk-like filtering units **80**, into the space **116** of the collecting tube **108** and then into chamber **244** from which the filtered fluid flows out for consumption through outlet port **246**.

When it is now required to rinse the filtration assembly **204**, the inlet port **240** and the filtered fluid outlet port **246** are shut whilst a rinsing fluid is pressurized through the rinsing fluid inlet port **210**, resulting in rinsing fluid jets emitting through the nozzles **220** (configured on arms **216** and **218**) directed towards the coiled filtering threads and simultaneously, the electric motor **255** is operated, giving rise to rotation of the filtering unit (namely the collecting pipe **108** with the associated disk-like filtering assemblies **80**). It is however appreciated that rather than electric motor **255** hydraulic or pneumonic rotating arrangements may be provided.

The rinsing fluid together with any dirt and remainders are then drained from the filter space **242** through outlet port **250** either to the environment or to a sewage line or recycling facility.

Turning now to the example illustrated in Figs. 9 and 10 there is illustrated a rinsing mechanism generally designated **300** according to a different example, comprising a rinsing mechanism housing **302** configured for securing to the end supports **120** (Figs. 5 and 6) ,said housing configured with a rinsing fluid main line **304** extending between two end plates **306** (only one of which seen in Figs. 10) and further configured with a hydraulic motor generally designated **312** configured for imparting a

rinsing fluid distribution pipe **320** with reciprocal pivotal motion in direction of arrowed line **322**. It is appreciated that the hydraulic motor **312** may be articulated to the rinsing fluid distribution pipe **320** through the end piece **306** or by a reciprocating link designated **325** (Fig. 9). Furthermore, the rinsing fluid distribution pipe may be reciprocated by any of a hydraulic, pneumatic or electric motor, or a combination thereof.

Integrally extending from the distribution pipe **320** there is a plurality of jet emitting arms **328** being in flow communication with the space **330** of the distribution pipe **320**. Each of said arms is configured with an internal lumen **332** terminating at a jet emitting nozzle **336**. The arrangement is such that the arms are pivotally disposed near a periphery of the filtration cassettes and are configured for reciprocal pivotal displacement (in a turntable-arm resembling fashion). The length of each of the arms **328** is substantially the length of a filtration segment **20** such that when the jet emitting arms **328** are reciprocally displaceable (about arrowed line **322**) between an innermost position where they reach to the collection pipe **108**, and an outermost position at the distal end of the filtration segment **20**, they rinse substantially the entire surface of the disc-like filtering assemblies.

In operation, a rinsing fluid is applied through the supply line **304** to thereby operate the reciprocating hydraulic motor **312** and rinsing fluid is then emitted into the pipe **330** and through lumens **332** and then out through the nozzles **336** upon imparting pivotal reciprocal displacement thereto.

Simultaneously, an electric/hydraulic/pneumonic motor rotates the filtering unit **100**, resulting in a fluid jet emitted against the coiled filtering threads **55** of the filtration segment **20** similar to the general concept as discussed in connection with reference to Figs. 8D.

While there have been shown several examples of the disclosed subject matter, it is to be understood that many changes may be made therein without departing from the spirit of the present disclosed subject matter, *mutatis mutandis*.

CLAIMS:

1. A filtration cassette having a rigid body configured for externally supporting a filtration media disposed thereover and having at least one filtering surface configured with a flow path facilitating filtered fluid flow from a space extending between the filtration media and the filtering surface, and extending towards an outlet terminal.

2. A filtration cassette according to claim 1, wherein the body is a flat, trapezoidal structure, such that an array of like filtration cassettes can be assembled into a near-to-circular, disc-like filtering assembly.

3. A filtration cassette according to claim 1, wherein the filtering surface is configured with a plurality of ribs projecting from the filtering surface for supporting the filtration media and facilitating fluid flow through the flow path, over the surface and between the plurality of ribs.

4. A filtration cassette according to claim 3, wherein the flow path extends over the filtering surface of the filtration cassette and then extends through the filtering surface into a collecting duct within the rigid body and further towards the outlet terminal.

5. A filtration cassette according to claim 1, wherein the body is configured at respective radial innermost and outermost ends thereof, with a filtration media support laterally projecting from the filtering surface.

6. A filtration cassette according to claim 1, wherein the filtering surface is configured with a concaved cross-section.

7. A filtration cassette according to claim 1, configured for assembly in a radial setup to a filtered fluid collecting duct, wherein coupling to the collecting duct is facilitated through a fluid-tight coupler of the outlet terminal.

8. A filtration cassette according to claim 1, configured at a distal end thereof with an arresting portion for securing to neighboring filtration cassettes.

9. A filtration cassette according to claim 8, wherein the arresting portion is in the form of a band-receiving groove configured at a rear end of the filtration cassette.

10. A filtration segment comprising a filtration cassette having a rigid body externally supporting a filtration media disposed thereover and having at least one filtering surface configured with a flow path facilitating filtered fluid flow from a space extending between the filtration media and the filtering surface, and extending towards an outlet terminal.

11. A filtration segment according to claim 10, wherein the filtration media is a filtration thread tensionally coiled over the filtration cassette at a multi-layered and tight configuration.

12. A filtration segment according to claim 11, wherein the thread is substantially continuous.

13. A filtration segment according to claim 11, wherein the tension of the coiled thread varies about one or both the longitudinal axis of the filtration cassette and between wrapping layers.

14. A filtration segment according to claim 11, wherein the filtration thread is continuous or not, with an altering thickness.

15. A filtration segment according to claim 11, wherein the filtration thread is wrapped about a longitudinal axis of the filtration cassette.

16. A filtration segment according to claim 10, configured for assembly in a radial setup to a filtered fluid collecting duct.

17. A filtration segment according to claim 16, wherein a distal end thereof is configured with an arresting portion for securing a plurality of like filtration segments into a disk-like filtration unit.

18. A filtering system configured with an array of filtration units, each composed of a plurality of filtration segments according to claim 10, said filtration segments being coupled into a filtered fluid collecting duct of the filtering system for providing filtered fluid.

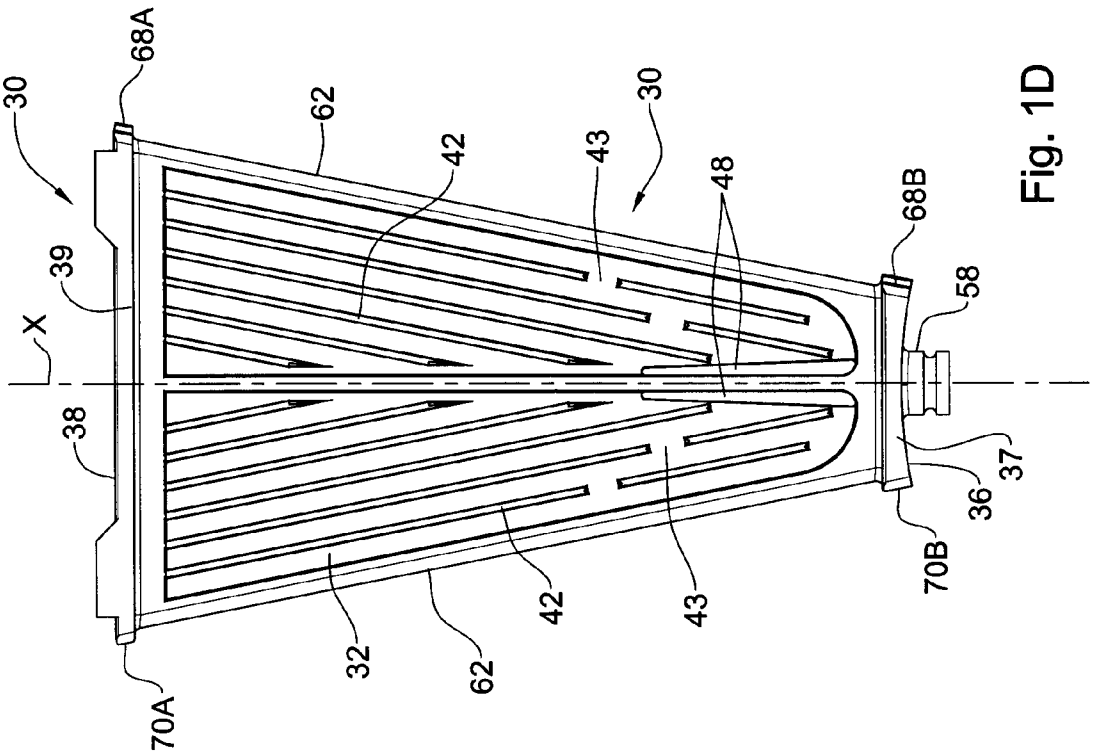
19. A filtering system according to claim 18, comprising a rinsing mechanism for rinsing the filtration cassettes, said rinsing mechanism comprising a plurality of parallely extending fluid jet emitting arms, each configured with at least one jet emitting nozzle juxtaposing and facing a filtration media of a filtration cassettes of the disk-like filtering units, and configured for selectively emitting a jet of rinsing fluid over the filtration media.

20. A filtering system according to claim 19, wherein the rinsing mechanism comprises at least one fluid jet emitting arm juxtaposed and facing the filtration media of the filtration units, and configured for selectively emitting a jet of rinsing fluid over the filtration media, the at least one jet emitting arm being configured with an array of jet nozzles disposed along its length and facing the filtration media, and whereby the disc-like filtering units are rotationally displaceable about a central axis thereof,

whereby a rinsing fluid jet is applied substantially over the entire surface of the filtration media as they rotate with respect to the jet emitting arms.

21. A filtering system according to claim 19, wherein the rinsing mechanism comprises one or more jet emitting arms, each fitted with one or more jet nozzles near a distal end of the one or more arms and wherein the arms are configured for reciprocal pivotal displacement in a turntable-arm resembling fashion over the filtration media of the disc-like filtering units, and whereby the disc-like filtering units are rotationally displaceable about a central axis thereof, whereby a rinsing fluid let emitted from the jet nozzles substantially rinses an entire face of a filtration segment.

22. A filtering system according to claim 21, wherein the jet emitting arms are pivotally disposed near a periphery of the filtration cassettes.


30
68A
62
42
43
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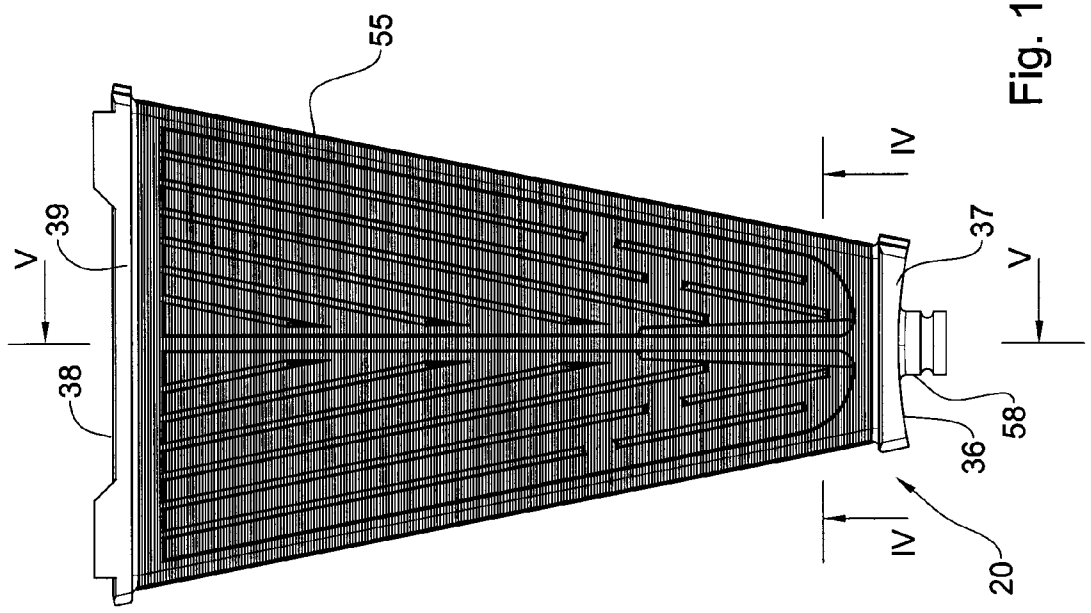
68B
58
39
X
38
37
36
70B
32
62
42
43
70A

Fig. 1D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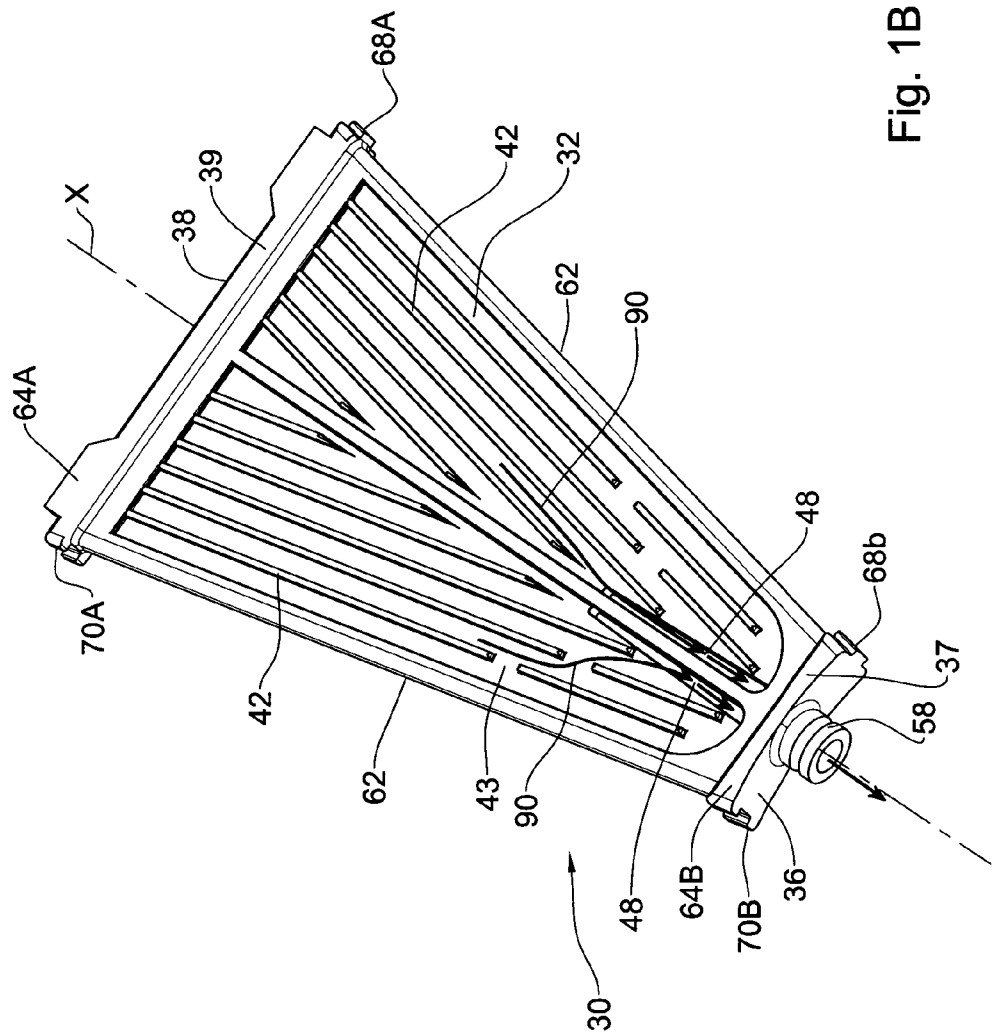
IV
39
V
37
V
38
58
36
IV
20

Fig. 1A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X
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32
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68b
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58
42
62
43
90
48
64B
70B
36
30

Fig. 1B

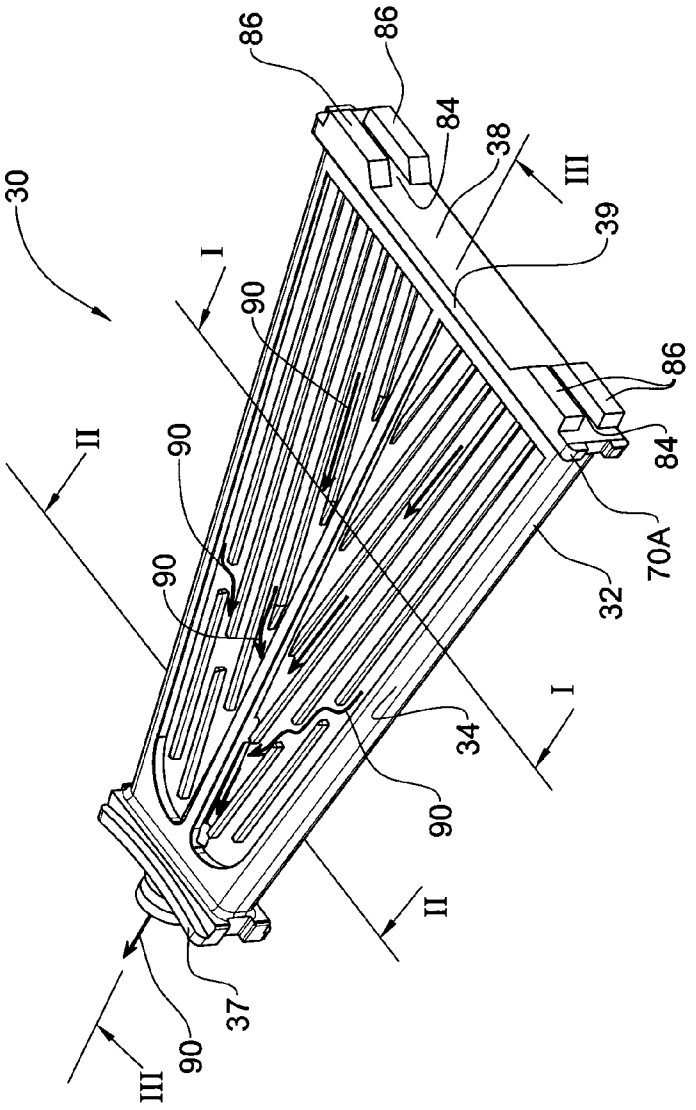

Fig. 1C

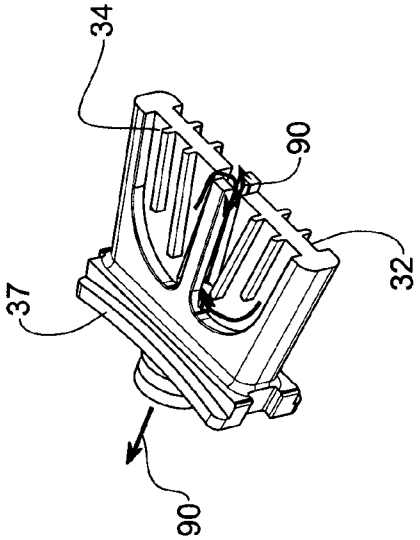

Fig. 2B

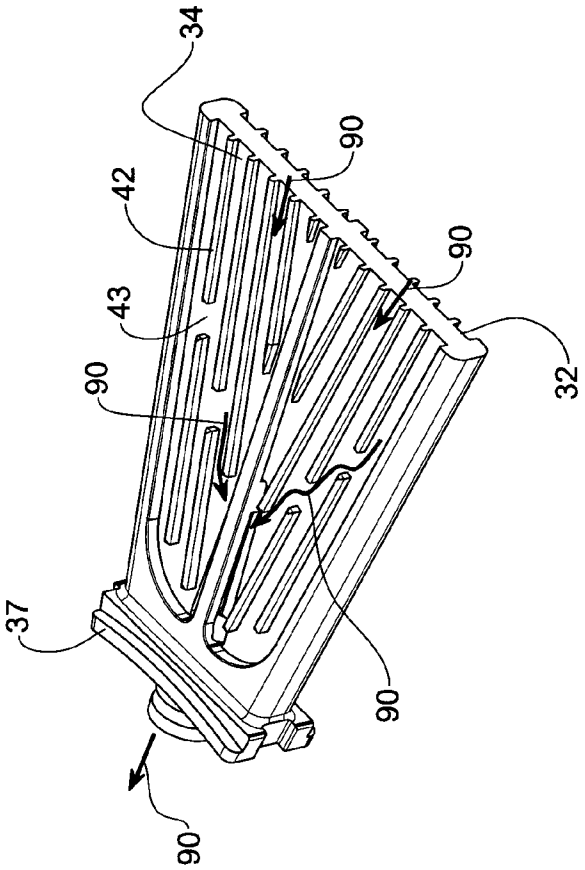

Fig. 2A

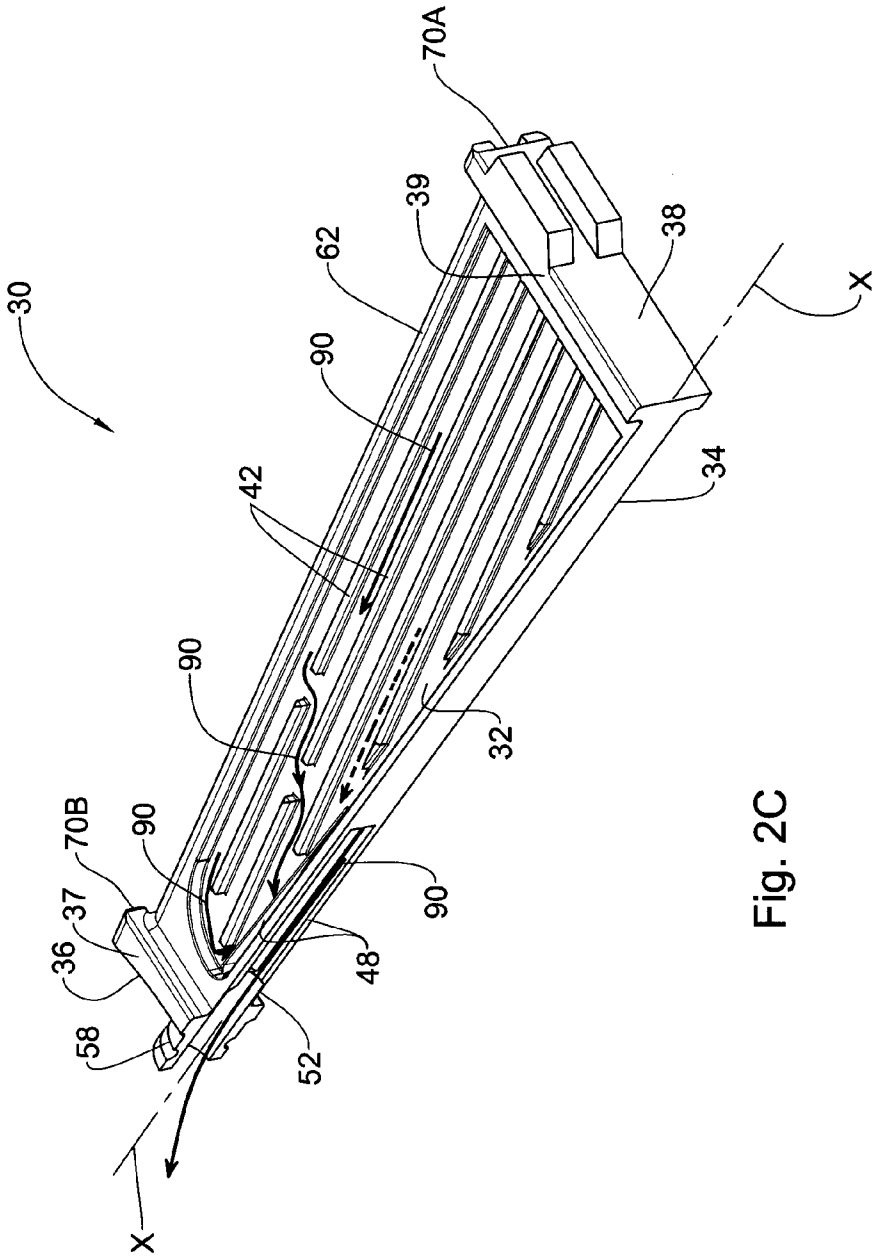

Fig. 2C

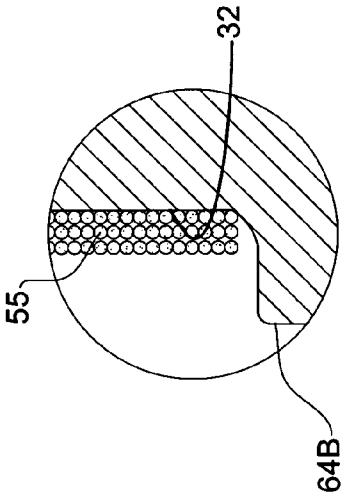

Fig. 3B

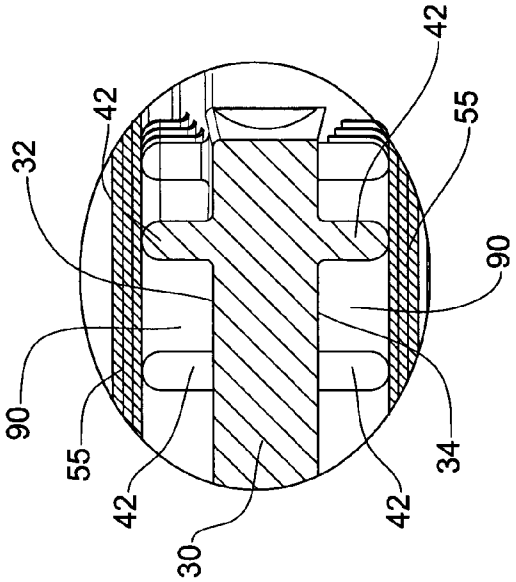

Fig. 3C

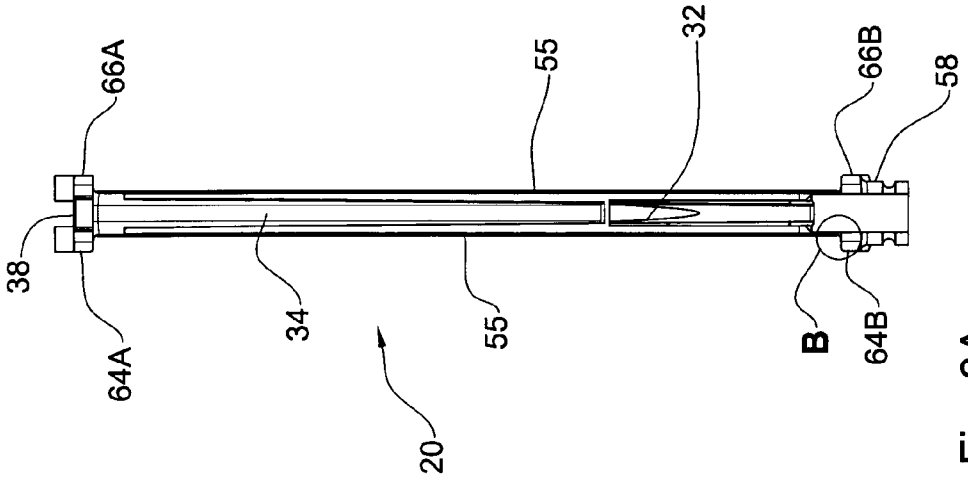

Fig. 3A

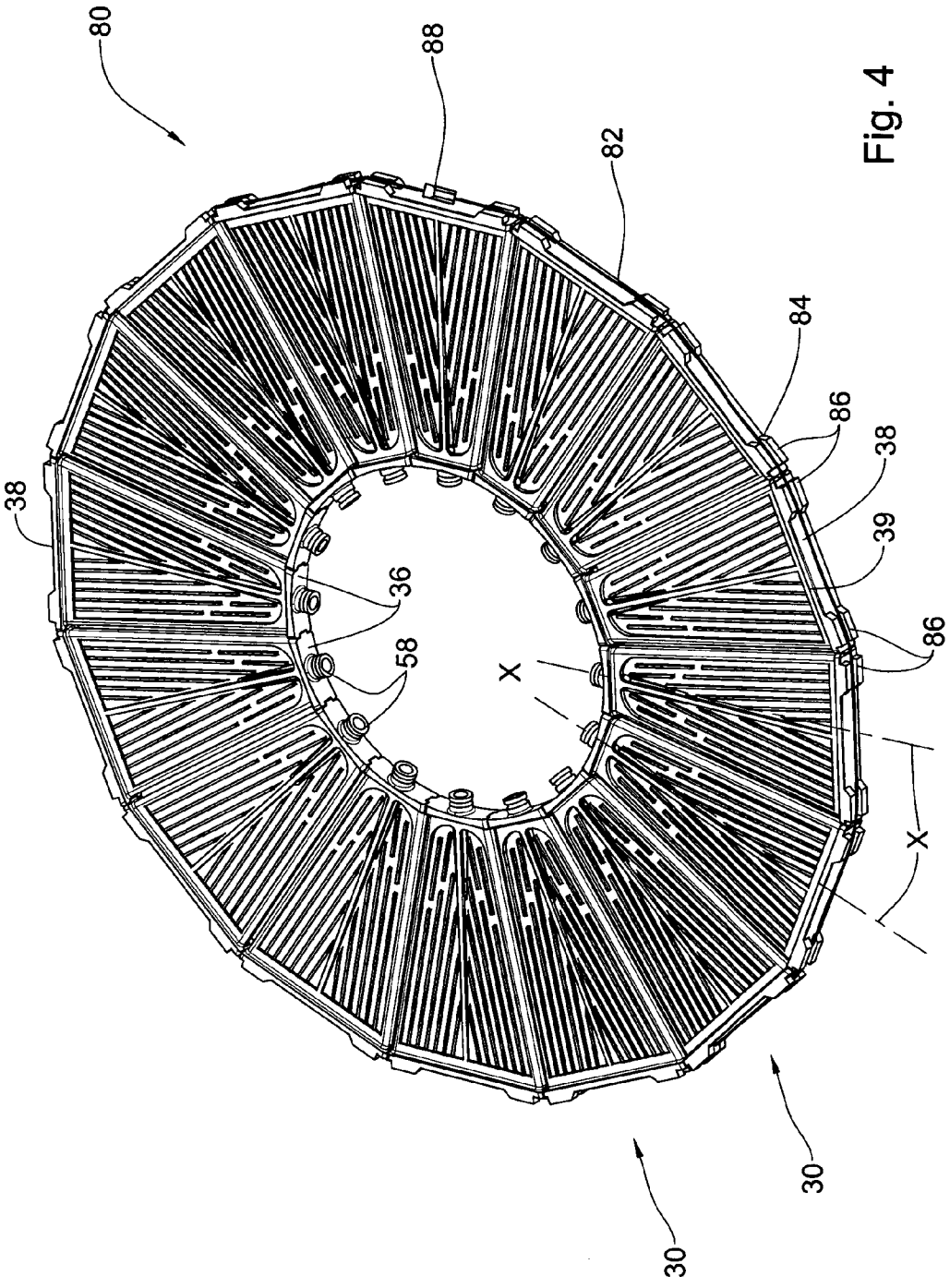

Fig. 4

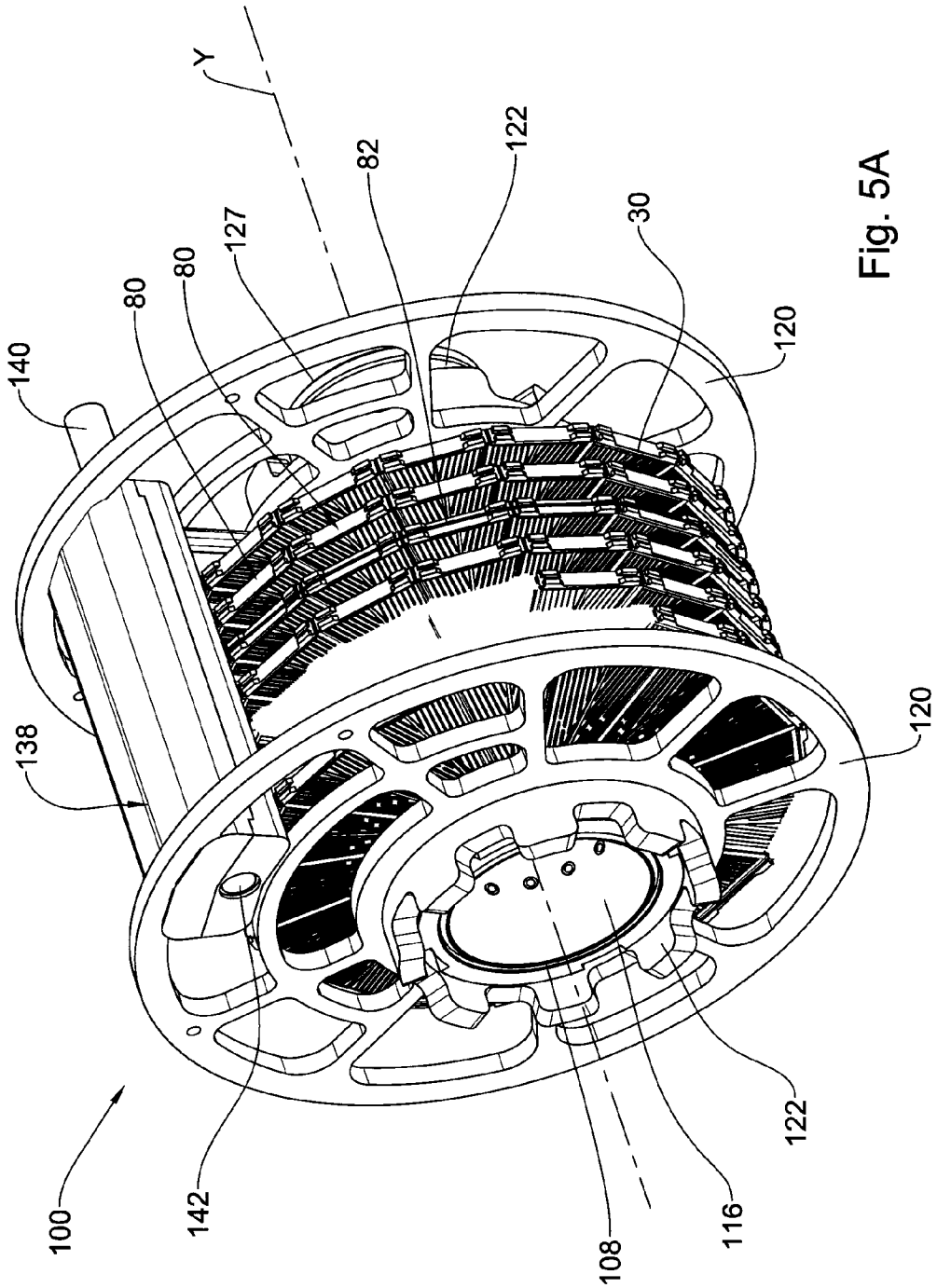

Fig. 5A

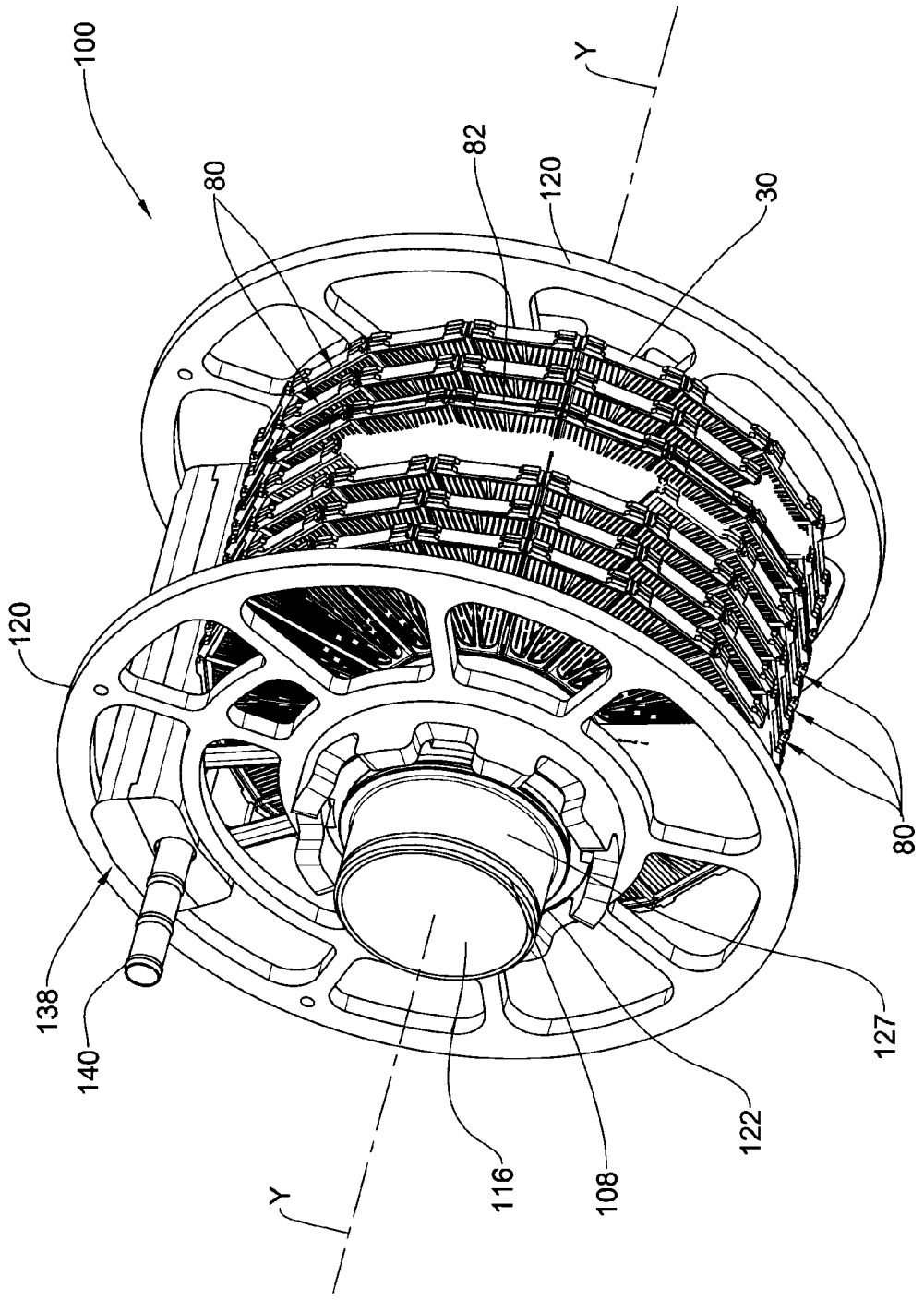

Fig. 5B

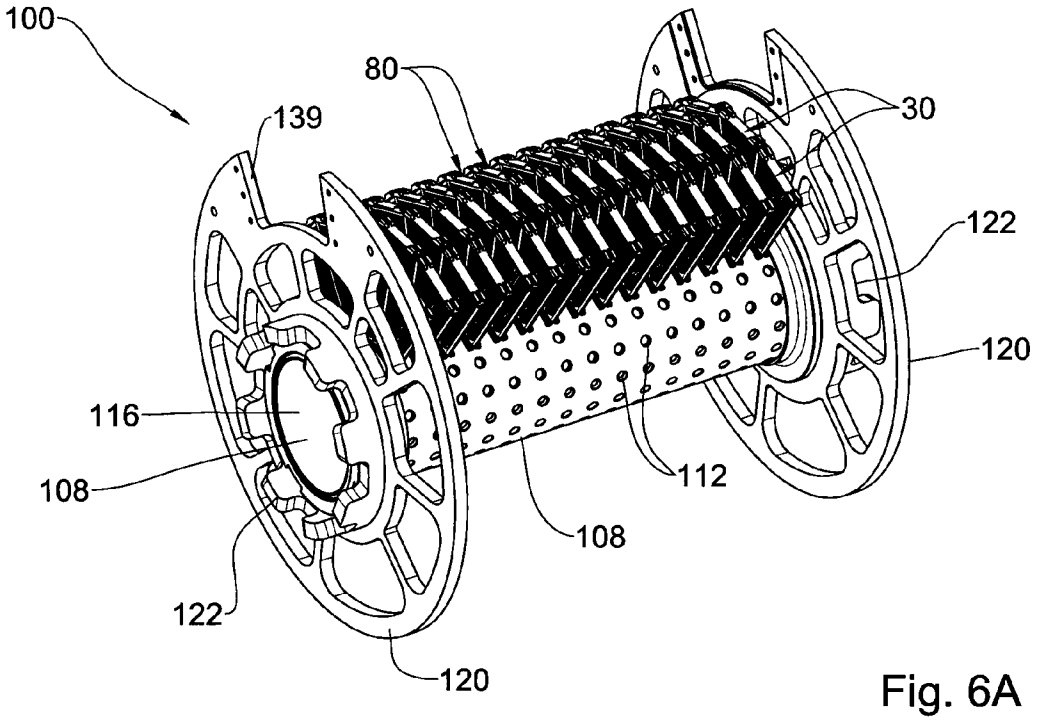
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Fig. 6A

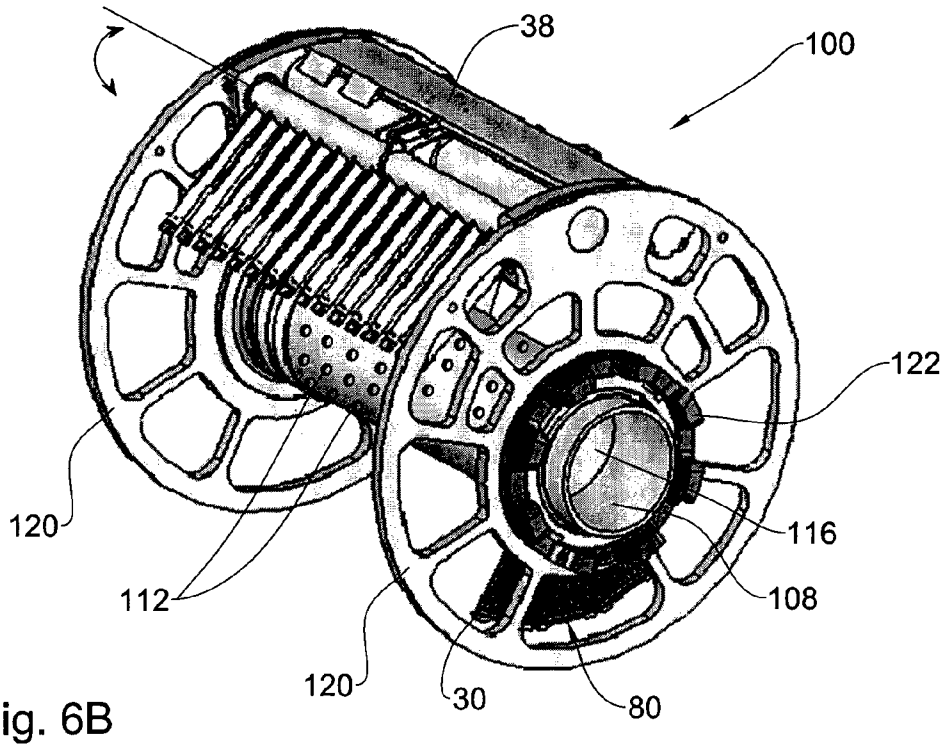
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Fig. 6B

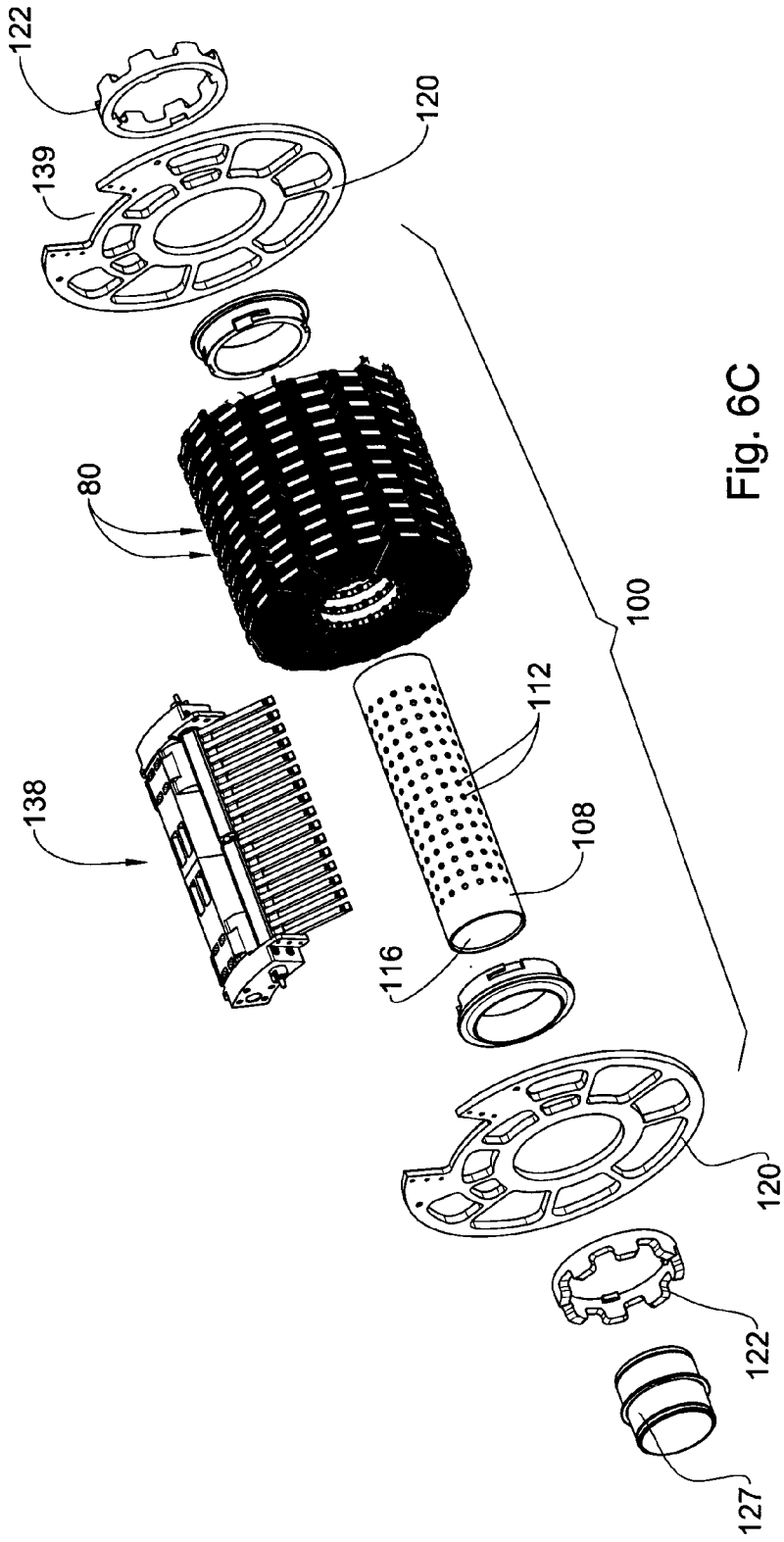

Fig. 6C

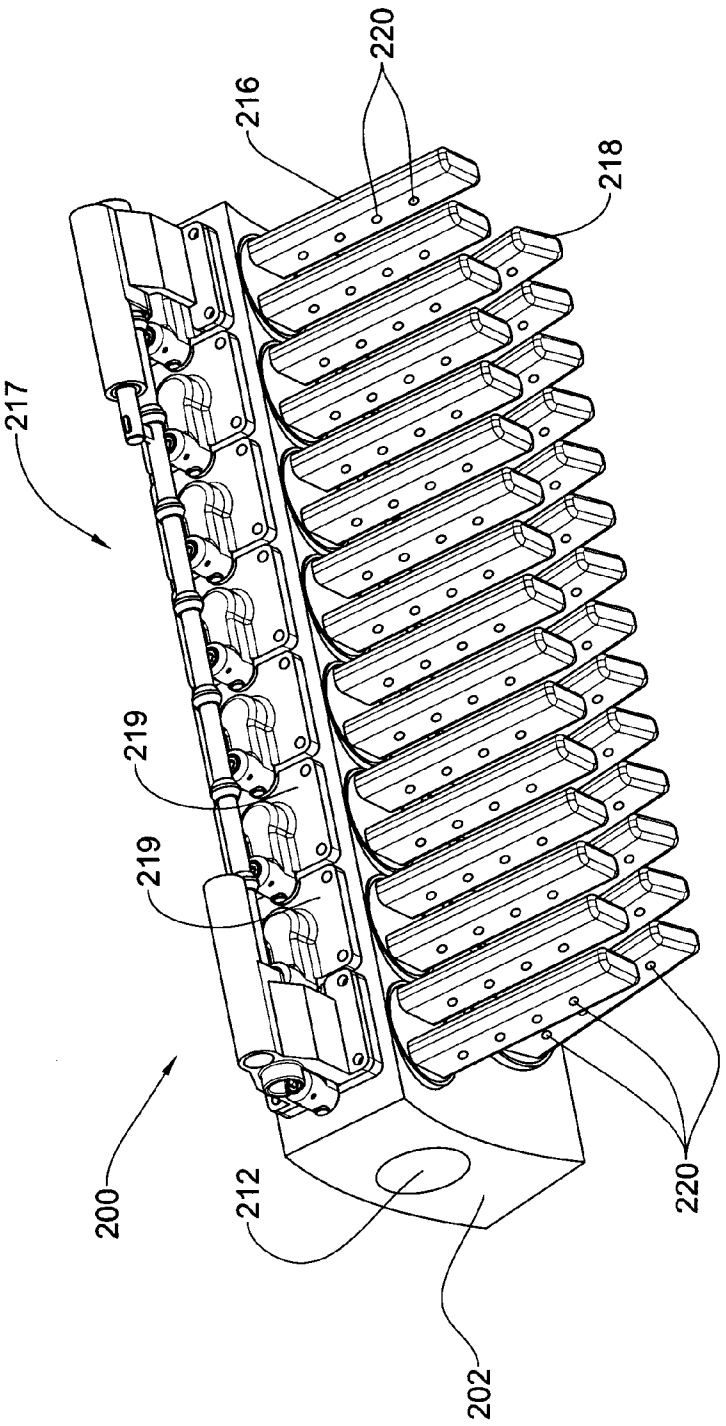

Fig. 7

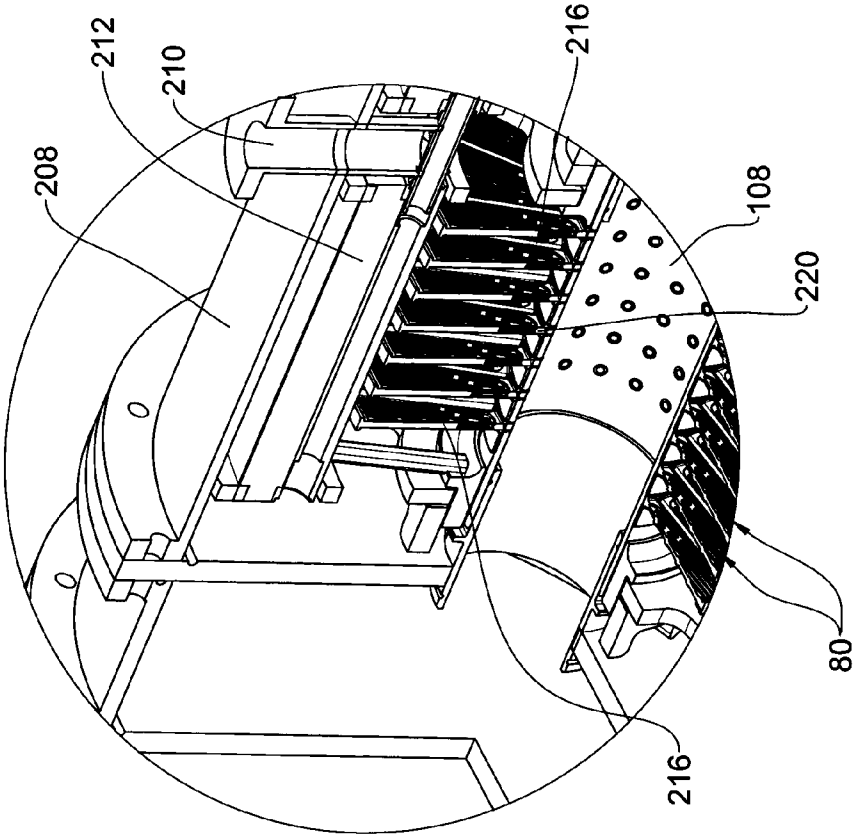
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Fig. 8B

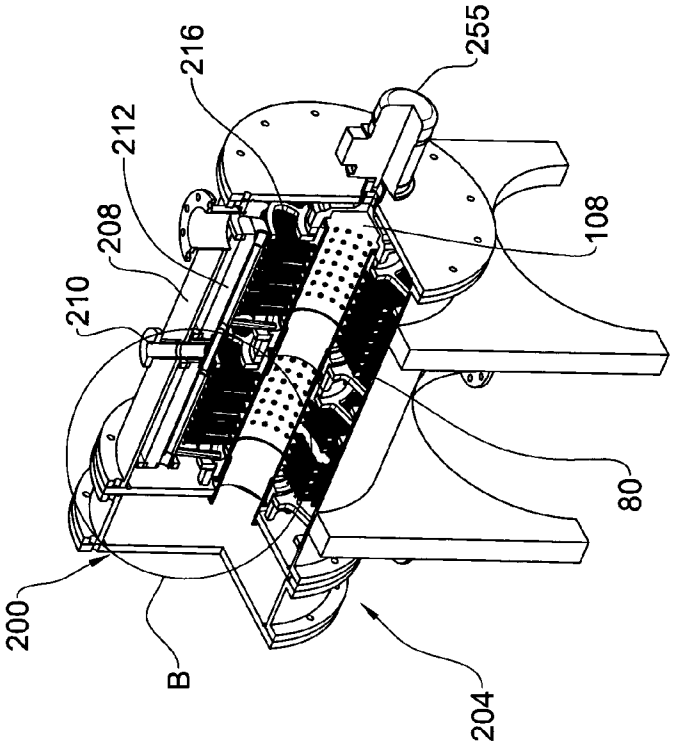
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Fig. 8A

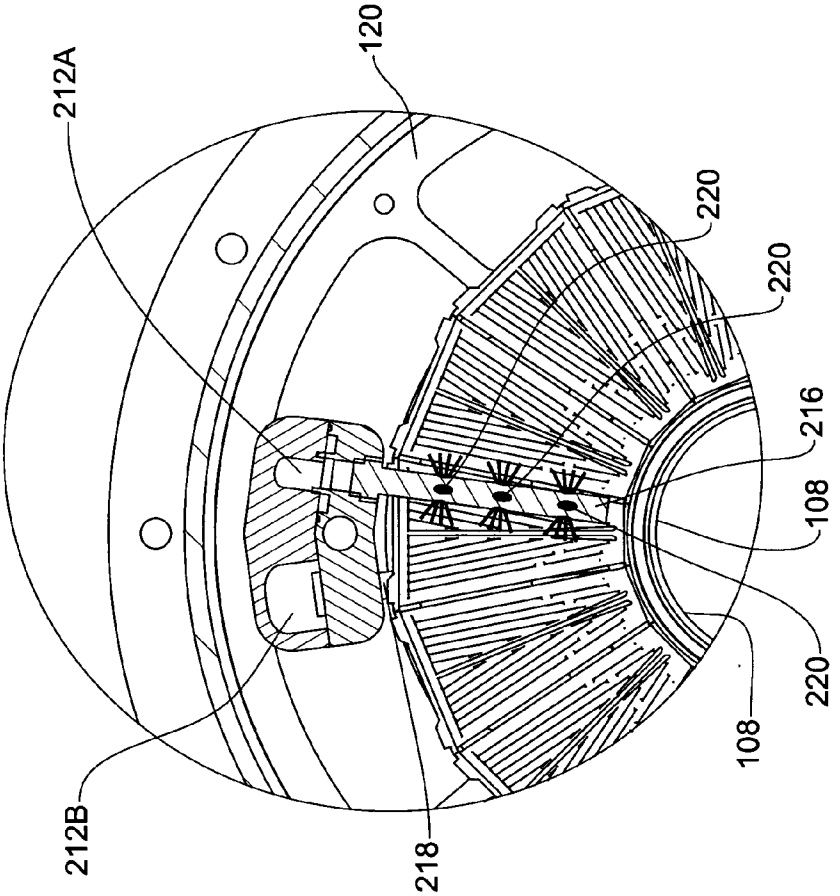
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Fig. 8D

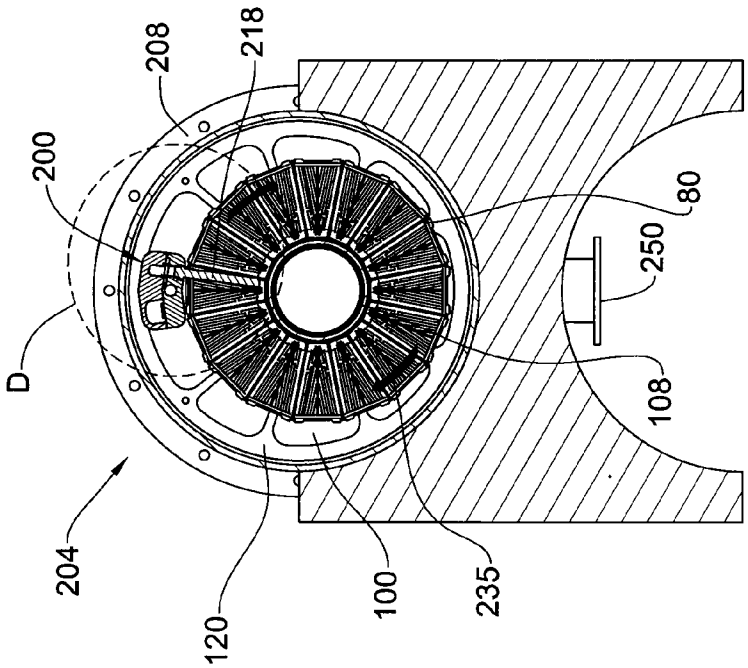
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Fig. 8C

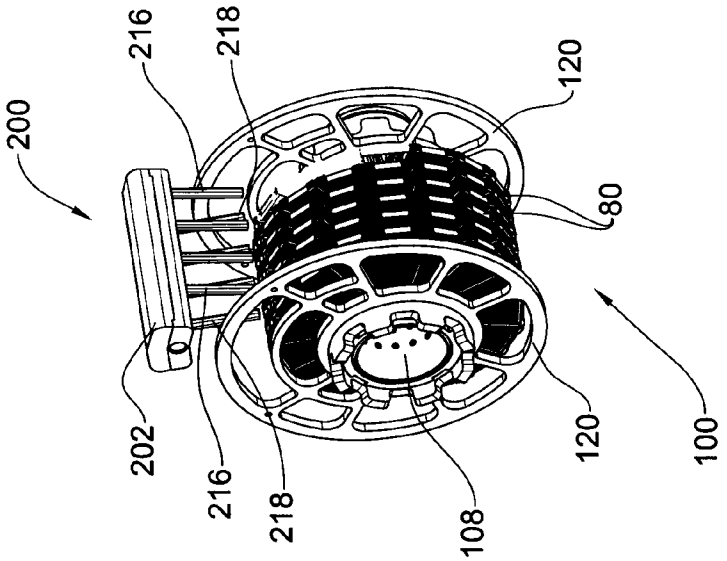
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Fig. 8F

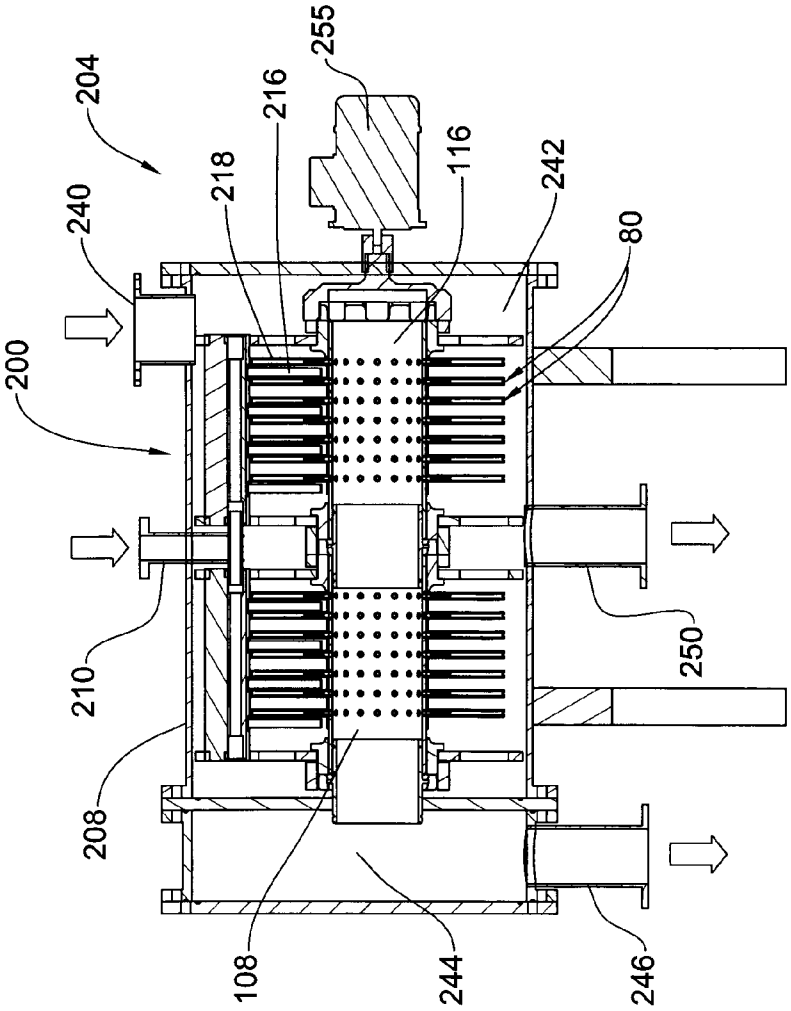
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Fig. 8E

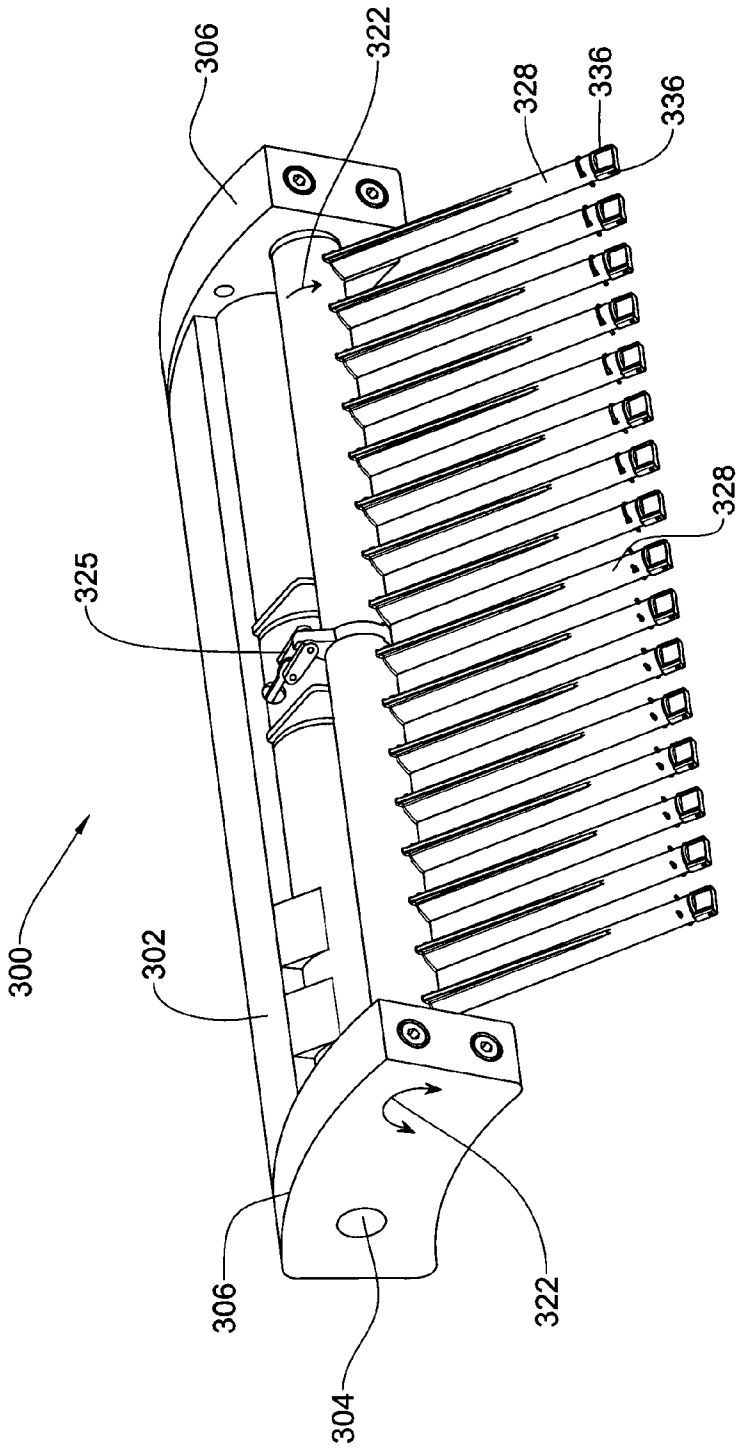

Fig. 9

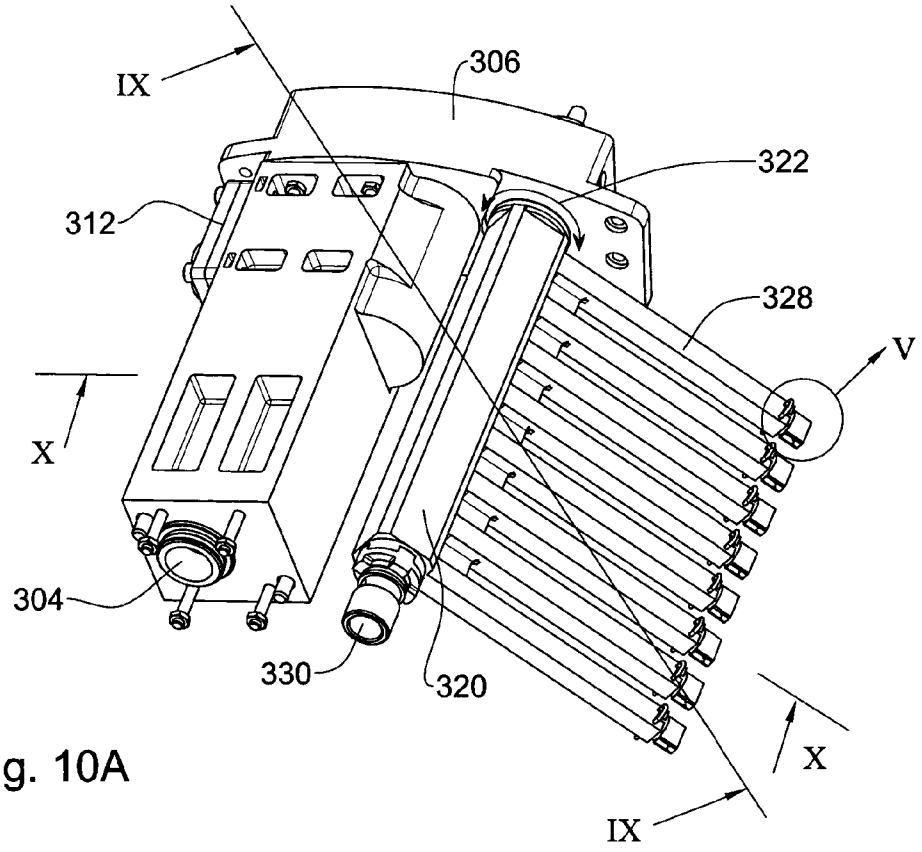

Fig. 10A

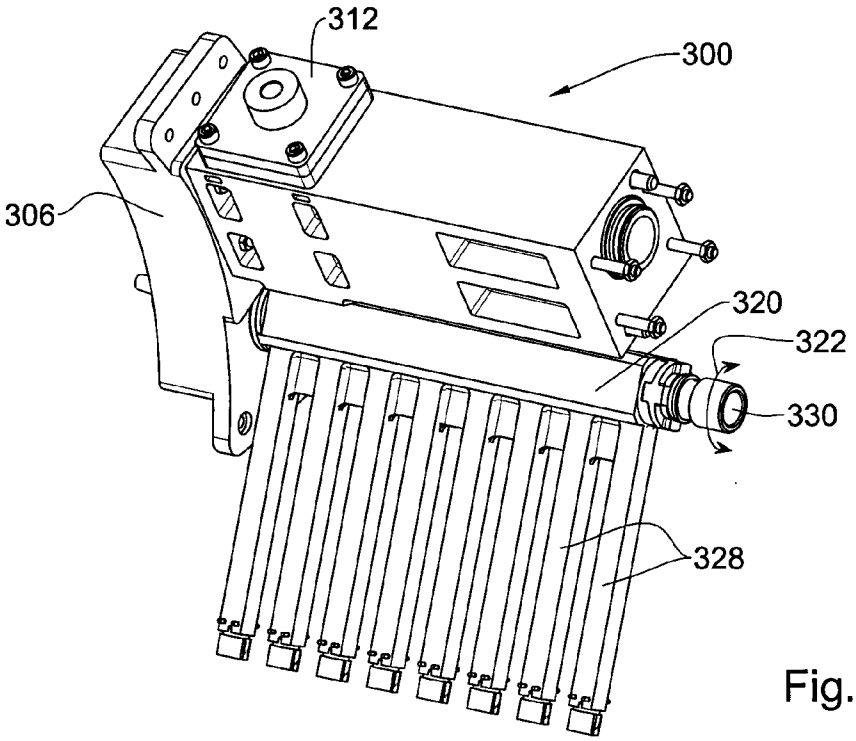

Fig. 10B

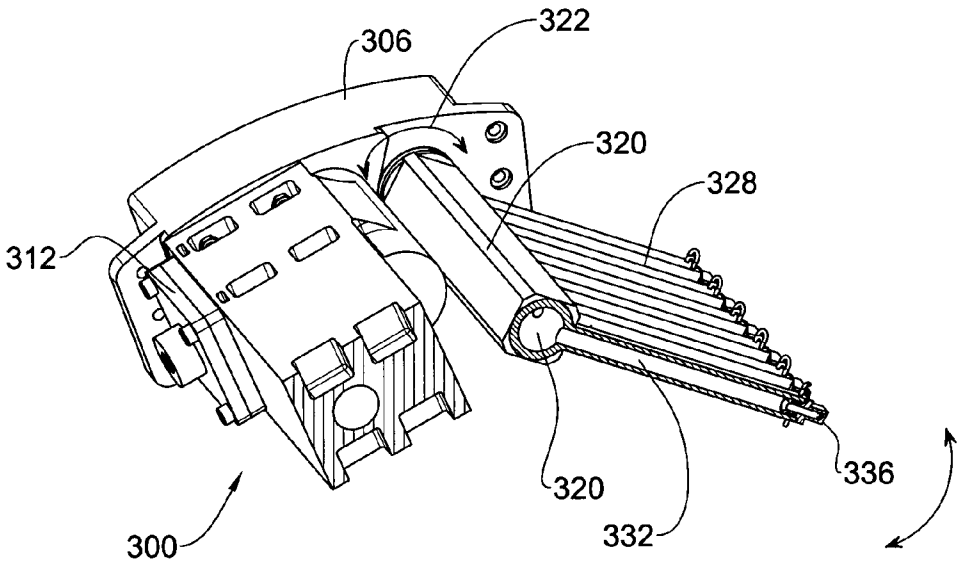

Fig. 10C

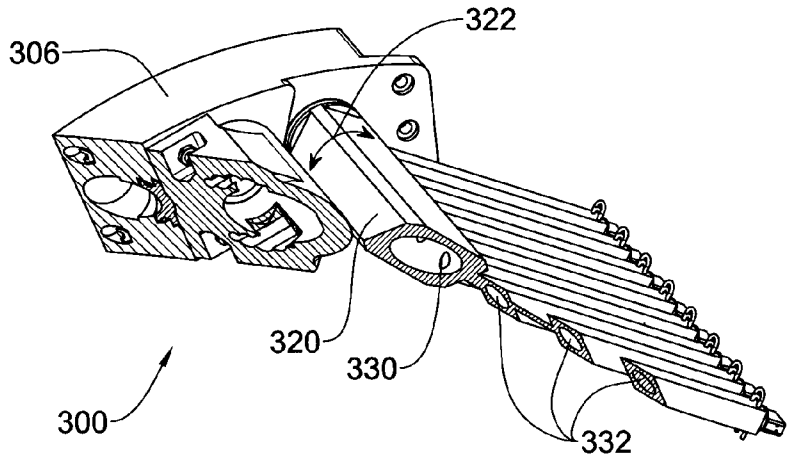

Fig. 10D