



US011686687B2

(12) **United States Patent**  
**Haught**

(10) **Patent No.:** **US 11,686,687 B2**  
(45) **Date of Patent:** **Jun. 27, 2023**

- (54) **OIL SIGHT GLASS** 4,888,990 A \* 12/1989 Bryan ..... G01F 23/02  
285/911
- (71) Applicant: **ESCO Products, Inc**, Houston, TX D790,999 S 7/2017 Haworth  
(US) D792,259 S 7/2017 Haworth  
D834,976 S 12/2018 Cooper
- (72) Inventor: **Christopher Haught**, Houston, TX 10,451,466 B2 10/2019 Cooper  
(US) 10,545,045 B2 1/2020 Fitch  
2004/0118146 A1\* 6/2004 Haller ..... F04C 23/008  
62/469
- (\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 39 days. 2008/0066543 A1\* 3/2008 Sabini ..... G01F 23/02  
73/304 C
- (21) Appl. No.: **17/114,973** 2014/0238156 A1\* 8/2014 Aljohani ..... G01N 1/10  
73/864.63
- (22) Filed: **Dec. 8, 2020** 2016/0305810 A1\* 10/2016 Fitch ..... F16K 37/0058  
2021/0188672 A1\* 6/2021 Shalon ..... C02F 1/686

(65) **Prior Publication Data**

US 2021/0223186 A1 Jul. 22, 2021

**Related U.S. Application Data**

(63) Continuation-in-part of application No. 29/721,673, filed on Jan. 22, 2020.

(51) **Int. Cl.**  
**G01N 21/95** (2006.01)  
**G01N 33/28** (2006.01)

(52) **U.S. Cl.**  
CPC ..... **G01N 21/95** (2013.01); **G01N 33/28** (2013.01)

(58) **Field of Classification Search**  
None  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

- 1,092,194 A \* 4/1914 Wood ..... F16N 13/16  
184/29
- 3,817,205 A \* 6/1974 Bonetti ..... G01F 23/02  
73/330

**FOREIGN PATENT DOCUMENTS**

- DE 202015002570 U1 \* 8/2016
- WO WO-2010009590 A1 \* 1/2010 ..... F25B 41/006
- WO WO2013048941 A1 4/2013

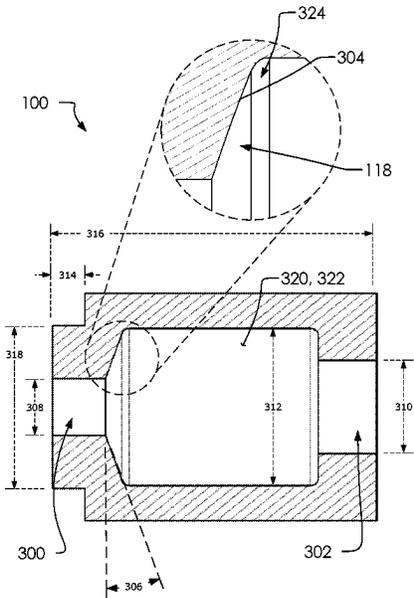
\* cited by examiner

*Primary Examiner* — Rufus L Phillips  
(74) *Attorney, Agent, or Firm* — Shannon Warren

(57) **ABSTRACT**

An oil sight glass for visual inspection of water and debris in a fluid such as oil within a reservoir to which the oil sight glass is connected. The oil sight glass comprises a sight body, a first end, a second end, a first fluid opening, a second fluid opening, a chamber, and a hex head, and a sidewall. The chamber is in fluid communication between the first fluid opening in the first end, and the second fluid opening in the second end.

**8 Claims, 4 Drawing Sheets**



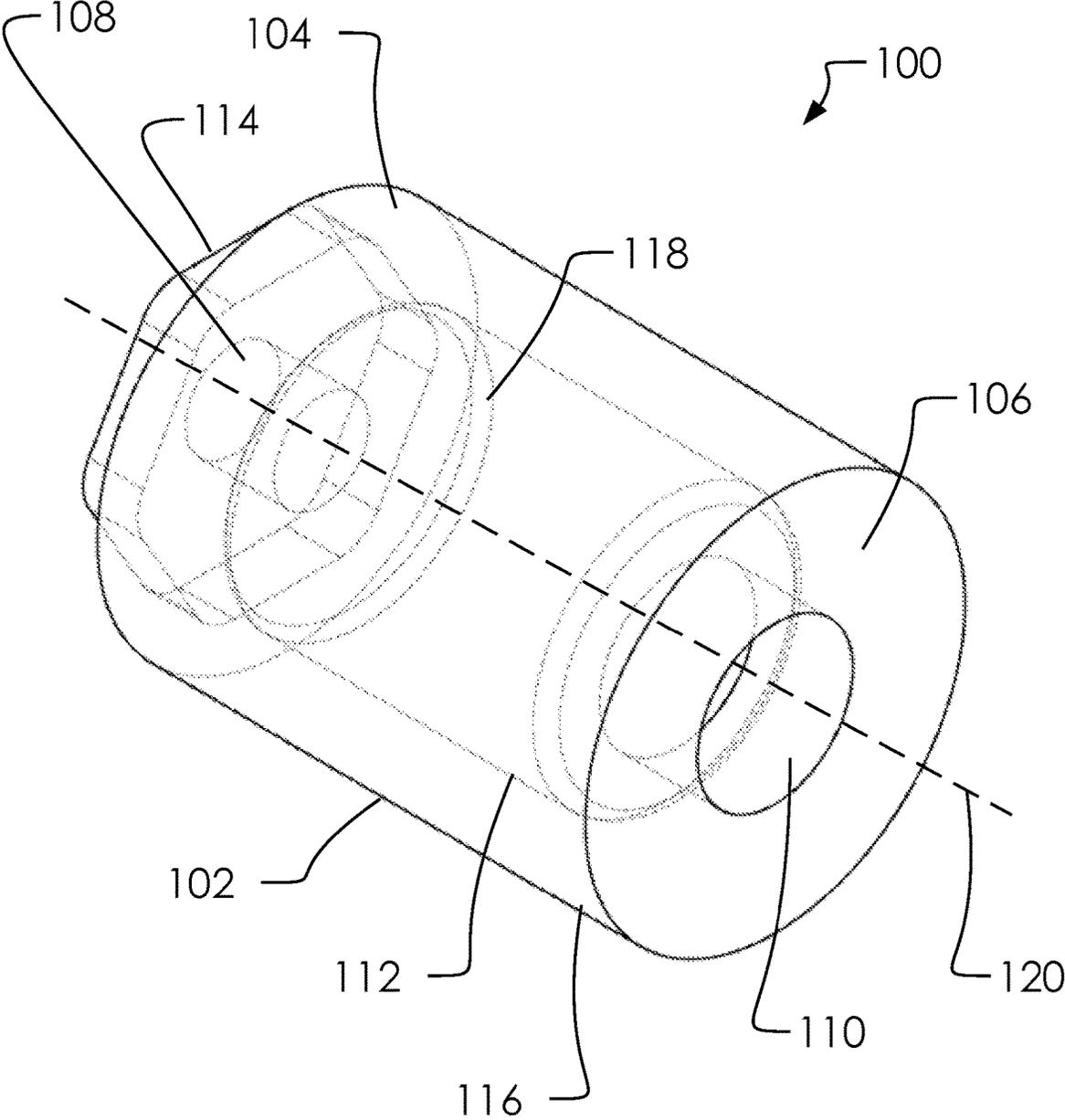


FIG. 1

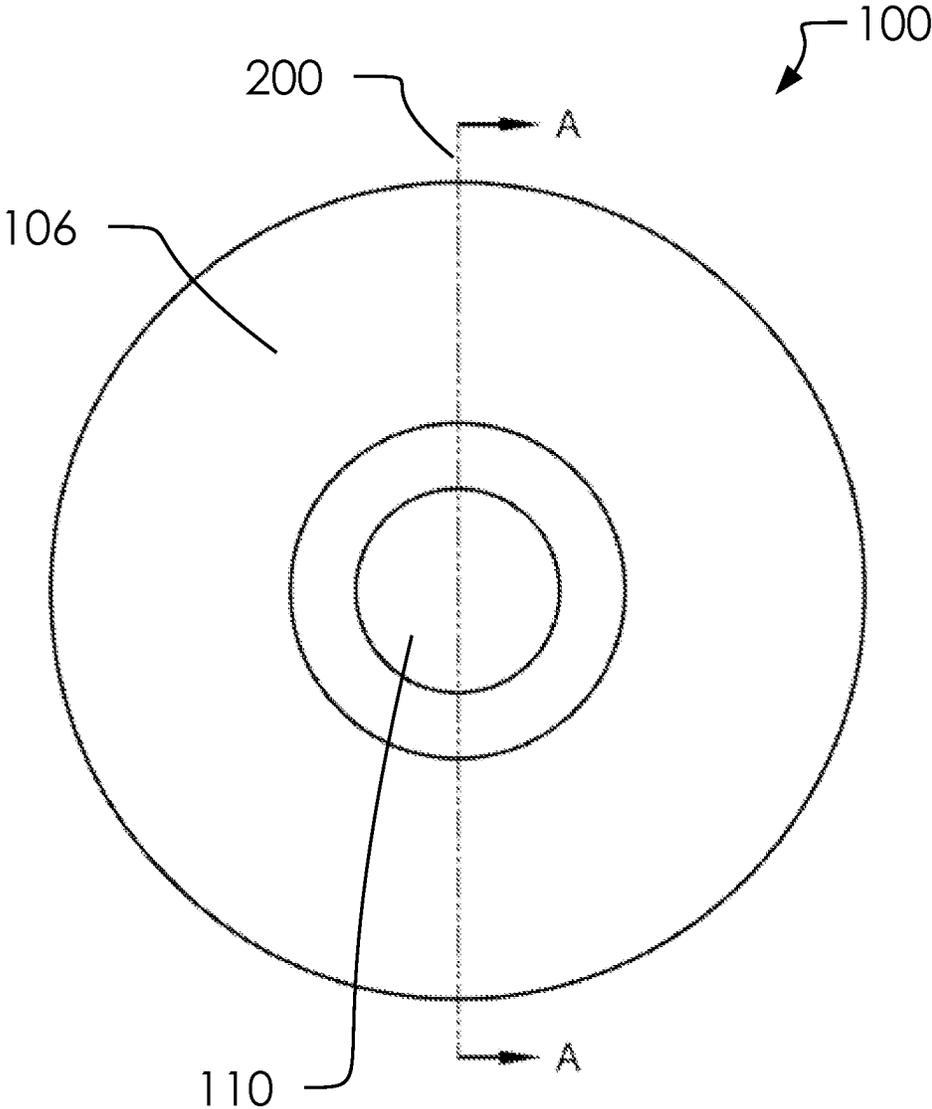


FIG. 2

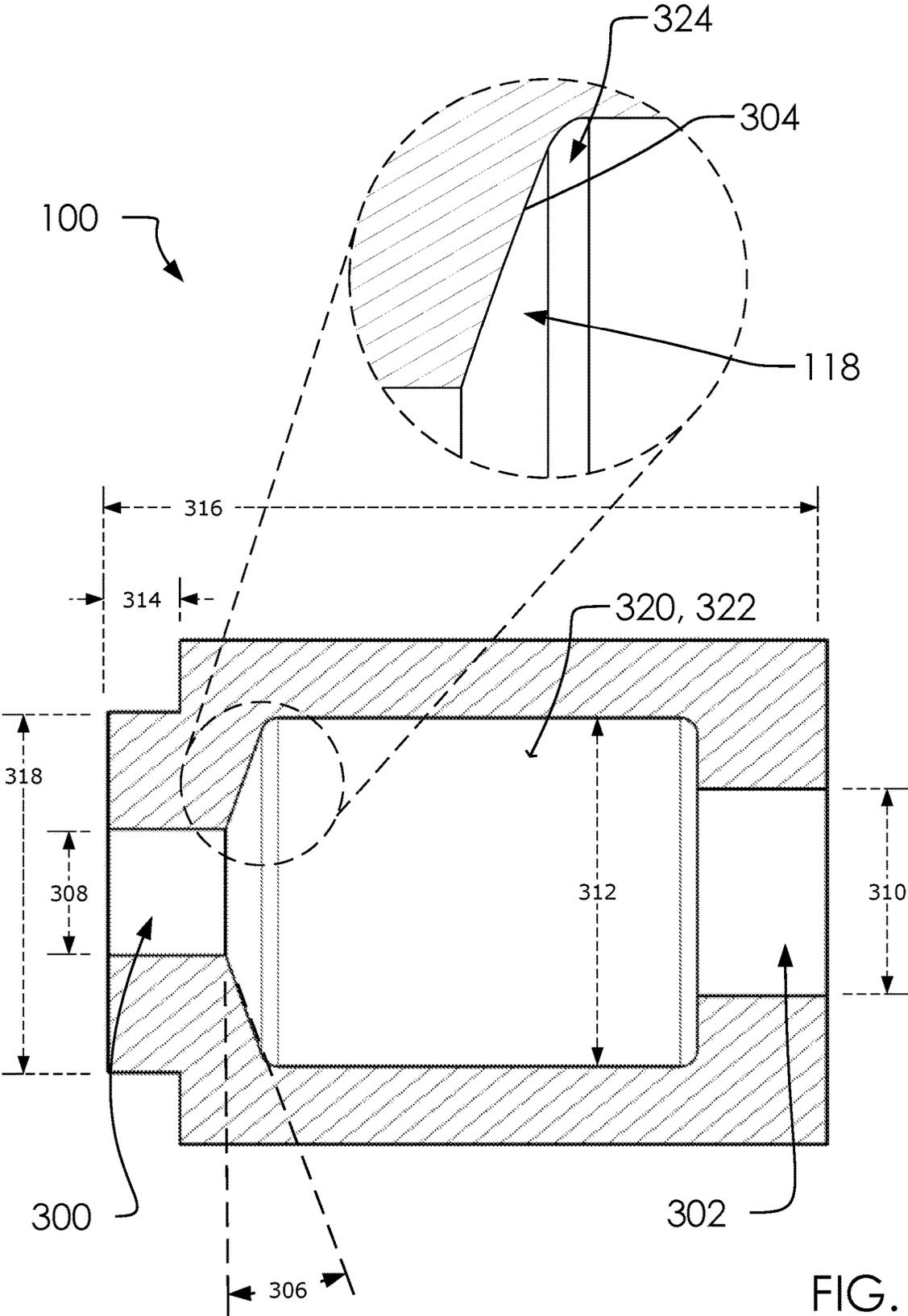


FIG. 3

100

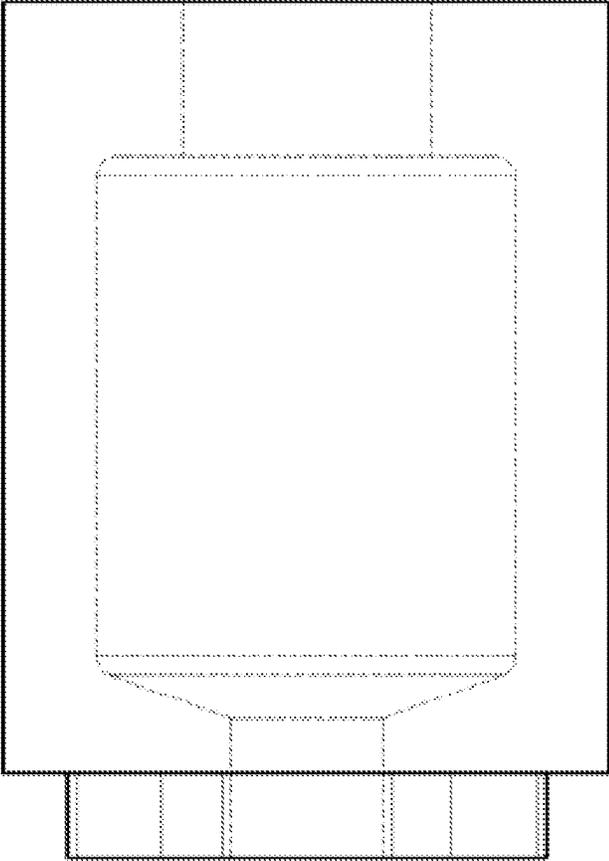


FIG. 4

1

**OIL SIGHT GLASS****CROSS-REFERENCE TO RELATED APPLICATIONS**

This application claims benefit to U.S. application Ser. Nos. 29/721,673 and 62/945,219.

**STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT (IF APPLICABLE)**

Not applicable.

**REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISC APPENDIX (IF APPLICABLE)**

Not applicable.

**BACKGROUND OF THE INVENTION**

Prior art known to the Applicant includes US20180073907, WO 2013048941, and US 20160305810, D792259, D790999, and D834976.

**BRIEF SUMMARY OF THE INVENTION**

An oil sight glass for visual inspection of water and debris in a fluid such as oil within a reservoir to which said oil sight glass is connected. Said oil sight glass comprises a sight body, a first end, a second end, a first fluid opening, a second fluid opening, a chamber, and a hex head, and a sidewall. Said chamber is in fluid communication between said first fluid opening in said first end, and said second fluid opening in said second end.

Said oil sight glass for visual inspection of water and debris in a fluid such as oil within a reservoir to which said oil sight glass is connected. Said oil sight glass comprises said sight body, said first end, said second end, said first fluid opening, said second fluid opening, said chamber, and said hex head, and said sidewall. Said chamber comprises a chamber draining neck. Said chamber draining neck comprises a concave indentation in a first end of said chamber being aligned with a central axis. Said chamber draining neck comprises an angle relative to a perpendicular plane from said central axis. Said chamber is in fluid communication between said first fluid opening in said first end, and said second fluid opening in said second end.

Said oil sight glass for visual inspection of water and debris in a fluid such as oil within a reservoir to which said oil sight glass is connected. Said oil sight glass comprises said sight body, said first end, said second end, said first fluid opening, said second fluid opening, said chamber, and said hex head, and said sidewall. Said chamber is in fluid communication between said first fluid opening in said first end, and said second fluid opening in said second end. Said first fluid opening is aligned with said central axis, and further, centered on said hex head. Said hex head is an extension out of said first end. Said hex head is configured to allow users to tighten and/or remove said oil sight glass without damaging corresponding equipment. Said hex head is configured to receive and selectively connect to tools in order to grab and twist said oil sight glass.

**BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING**

FIG. 1 illustrates a perspective overview of an oil sight glass 100.

2

FIG. 2 illustrates an elevated first side view of said oil sight glass 100 with a section cut A line 200.

FIG. 3 illustrates an elevated cross-section front view of said oil sight glass 100.

FIG. 4 illustrates an elevated top view of said oil sight glass 100.

**DETAILED DESCRIPTION OF THE INVENTION**

The following description is presented to enable any person skilled in the art to make and use the invention as claimed and is provided in the context of the particular examples discussed below, variations of which will be readily apparent to those skilled in the art. In the interest of clarity, not all features of an actual implementation are described in this specification. It will be appreciated that in the development of any such actual implementation (as in any development project), design decisions must be made to achieve the designers' specific goals (e.g., compliance with system- and business-related constraints), and that these goals will vary from one implementation to another. It will also be appreciated that such development effort might be complex and time-consuming, but would nevertheless be a routine undertaking for those of ordinary skill in the field of the appropriate art having the benefit of this disclosure. Accordingly, the claims appended hereto are not intended to be limited by the disclosed embodiments, but are to be accorded their widest scope consistent with the principles and features disclosed herein.

FIG. 1 illustrates a perspective overview of an oil sight glass 100.

In one embodiment, said oil sight glass 100 can comprise a sight body 102, a first exterior end 104, a second exterior end 106, a first fluid opening 108, a second fluid opening 110, an interior fluid chamber 112, and a hex head 114, and a sidewall 116. In one embodiment, said interior fluid chamber 112 can comprise a chamber draining neck 118, as discussed herein.

In one embodiment, said oil sight glass 100 can function to provide visual confirmation of water and/or debris in a fluid such as oil. Said fluid may be stored in a reservoir (not illustrated), and said oil sight glass 100 can be connected to the reservoir with either said first exterior end 104 and said second exterior end 106. Due to wear, water, particulates, heat, etc., the fluid may become contaminated; in turn, this contaminant can migrate to the reservoir and may settle at the bottom as sediment.

This disclosure presents improvements to the prior art as to the inclusion of said chamber draining neck 118 for drainage and said hex head 114 for assistance in installation and removal of said oil sight glass 100.

In one embodiment, said sight body 102 can comprise a substantially cylindrical object between said first exterior end 104 and said second exterior end 106, aligned along a central axis 120. Said interior fluid chamber 112 can be in fluid communication between said first fluid opening 108 in said first exterior end 104 and said second fluid opening 110 in said second exterior end 106.

Said first fluid opening 108 can be aligned with said central axis 120, and further, centered on said hex head 114. Said first fluid opening 108, said second fluid opening 110 and said interior fluid chamber 112 can all be aligned with said central axis 120.

Said hex head 114 can be an extension out of said first exterior end 104. Said oil sight glass 100 can be machined or created from an injected polymer and/or acrylic. Said

sight body **102** and said hex head **114** can, consequently, be formed of the same material at the time of manufacturing.

Said hex head **114** can allow users to tighten and/or remove said oil sight glass **100** without damaging corresponding equipment. As is known in the art, oil sight glasses can become adhered to other equipment on account of temperature and chemical changes, wherein, removing a sight glass may require destroying or damaging the sight glass. By including said hex head **114**, common tools can grab and twist said oil sight glass **100**.

FIG. 2 illustrates an elevated first side view of said oil sight glass **100** with a section cut A line **200**.

FIG. 3 illustrates an elevated cross-section front view of said oil sight glass **100**.

In one embodiment, said first fluid opening **108** can comprise a first end chamber **300** which leads into said interior fluid chamber **112**, which in turn leads into a second end chamber **302** at said second fluid opening **110**.

In one embodiment, said chamber draining neck **118** can comprise a concave indentation in a first end **304** of said interior fluid chamber **112** being aligned with said central axis **120**. In one embodiment, said chamber draining neck **118** can comprise a chamber neck angle **306** relative to a perpendicular plane from said central axis **120**. In one embodiment, said chamber neck angle **306** can comprise 15-30 degrees, and in a preferred embodiment, 20 degrees. Said chamber neck angle **306** can aid in draining a fluid out of said interior fluid chamber **112** more completely than prior embodiments which were flat.

Said first end chamber **300** can comprise a first diameter **308**, said second end chamber **302** can comprise a second diameter **310**, said interior fluid chamber **112** can comprise a chamber diameter **312**, and said hex head **114** can comprise a hex gap height **314**. Said oil sight glass **100** can comprise a glass length **316**, and said hex head **114** can comprise a head height **318**. In one embodiment, said hex gap height **314** can comprise 1.25 inches, said chamber diameter **312** can comprise 1.2 inches, said glass length **316** can comprise 2.5 inches, and said head height **318** can comprise 0.25 inches.

Said interior fluid chamber **112** comprises a cylindrical chamber portion **320** comprising an inner wall **322** being substantially parallel with said central axis **120**, said chamber draining neck **118**, and said chamber draining neck **118** comprises a concave indentation **324** between said cylindrical chamber portion **320** and said chamber draining neck **118** in said first chamber end of said interior fluid chamber **112** being aligned with said central axis **120**.

FIG. 4 illustrates an elevated top view of said oil sight glass **100**.

These parts are presented in this specification:

said oil sight glass **100**,  
 said sight body **102**,  
 said first exterior end **104**,  
 said second exterior end **106**,  
 said first fluid opening **108**,  
 said second fluid opening **110**,  
 said interior fluid chamber **112**,  
 said hex head **114**,  
 said sidewall **116**,  
 said chamber draining neck **118**,  
 said central axis **120**,  
 said section cut A line **200**,  
 said first end chamber **300**,  
 said second end chamber **302**,  
 said first end **304**,  
 said chamber neck angle **306**,

said first diameter **308**,  
 said second diameter **310**,  
 said chamber diameter **312**,  
 said hex gap height **314**,  
 said glass length **316**,  
 said head height **318**,  
 said cylindrical chamber portion **320**,  
 said inner wall **322**, and  
 said concave indentation **324**.

These sentences are presented with reference to the original claims to ensure the specification contains the contents of the claims:

Said oil sight glass **100** for visual inspection of water and debris in a fluid such as oil within a reservoir to which said oil sight glass **100** can be connected. Said oil sight glass **100** comprises said sight body **102**, said first exterior end **104**, said second exterior end **106**, said first fluid opening **108**, said second fluid opening **110**, said interior fluid chamber **112**, and said hex head **114**, and said sidewall **116**. Said interior fluid chamber **112** can be in fluid communication between said first fluid opening **108** in said first exterior end **104**, and said second fluid opening **110** in said second exterior end **106**.

Said interior fluid chamber **112** comprises said chamber draining neck **118**.

Said oil sight glass **100** can be connected to the reservoir with either said first exterior end **104** and said second exterior end **106**.

Said sight body **102** comprises a substantially cylindrical object between said first exterior end **104** and said second exterior end **106**. Said sight body **102** can be aligned along said central axis **120**.

Said first fluid opening **108** can be aligned with said central axis **120**, and further, centered on said hex head **114**. Said first fluid opening **108**, said second fluid opening **110** and said interior fluid chamber **112** can be configured to all be aligned with said central axis **120**.

Said hex head **114** can be an extension out of said first exterior end **104**.

Said oil sight glass **100** can be machined or created from a material selected among an injected polymer and acrylic.

Said sight body **102** and said hex head **114** can be formed of the same material as said oil sight glass **100** at the time of manufacturing.

Said hex head **114** can be configured to allow users to tighten and/or remove said oil sight glass **100** without damaging corresponding equipment. Said hex head **114** can be configured to receive and selectively connect to tools in order to grab and twist said oil sight glass **100**.

Said first fluid opening **108** comprises said first end chamber **300** which leads into said interior fluid chamber **112**, which in turn leads into said second end chamber **302** at said second fluid opening **110**.

Said chamber draining neck **118** comprises a concave indentation in said first end **304** of said interior fluid chamber **112** being aligned with said central axis **120**. Said chamber draining neck **118** comprises said chamber neck angle **306** relative to a perpendicular plane from said central axis **120**.

Said chamber neck angle **306** comprises 15-30 degrees.

Said chamber neck angle **306** comprises 20 degrees.

Said oil sight glass **100** for visual inspection of water and debris in a fluid such as oil within a reservoir to which said oil sight glass **100** can be connected. Said oil sight glass **100** comprises said sight body **102**, said first exterior end **104**, said second exterior end **106**, said first fluid opening **108**, said second fluid opening **110**, said interior fluid chamber **112**, and said hex head **114**, and said sidewall **116**. Said

5

interior fluid chamber 112 comprises said chamber draining neck 118. Said chamber draining neck 118 comprises a concave indentation in said first end 304 of said interior fluid chamber 112 being aligned with said central axis 120. Said chamber draining neck 118 comprises said chamber neck angle 306 relative to a perpendicular plane from said central axis 120. Said interior fluid chamber 112 can be in fluid communication between said first fluid opening 108 in said first exterior end 104, and said second fluid opening 110 in said second exterior end 106.

Said oil sight glass 100 for visual inspection of water and debris in a fluid such as oil within a reservoir to which said oil sight glass 100 can be connected. Said oil sight glass 100 comprises said sight body 102, said first exterior end 104, said second exterior end 106, said first fluid opening 108, said second fluid opening 110, said interior fluid chamber 112, and said hex head 114, and said sidewall 116. Said interior fluid chamber 112 can be in fluid communication between said first fluid opening 108 in said first exterior end 104, and said second fluid opening 110 in said second exterior end 106. Said first fluid opening 108 can be aligned with said central axis 120, and further, centered on said hex head 114. Said hex head 114 can be an extension out of said first exterior end 104. Said hex head 114 can be configured to allow users to tighten and/or remove said oil sight glass 100 without damaging corresponding equipment. Said hex head 114 can be configured to receive and selectively connect to tools in order to grab and twist said oil sight glass 100.

Various changes in the details of the illustrated operational methods are possible without departing from the scope of the following claims. Some embodiments may combine the activities described herein as being separate steps. Similarly, one or more of the described steps may be omitted, depending upon the specific operational environment the method is being implemented in. It is to be understood that the above description is intended to be illustrative, and not restrictive. For example, the above-described embodiments may be used in combination with each other. Many other embodiments will be apparent to those of skill in the art upon reviewing the above description. The scope of the invention should, therefore, be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled. In the appended claims, the terms “including” and “in which” are used as the plain-English equivalents of the respective terms “comprising” and “wherein.”

The invention claimed is:

1. An oil sight glass for visual inspection of water and debris in a fluid such as oil within a reservoir to which said oil sight glass is connected; wherein,

said oil sight glass comprises a sight body, a first exterior end, a second exterior end, a first fluid opening, a second fluid opening, an interior fluid chamber, and a hex head, and a sidewall;

said interior fluid chamber is in fluid communication between said first fluid opening in said first exterior end, and said second fluid opening in said second exterior end;

6

said sight body is aligned along a central axis; said first fluid opening, said second fluid opening, said hex head and said interior fluid chamber are aligned with said central axis;

an exterior portion of said sight body at said first exterior end comprises said hex head comprising a hexagonal cross-section perpendicular to said central axis;

said hex head is configured to receive and selectively connect to tools to grab and twist said oil sight glass; and

said oil sight glass comprises a material selected among an injected polymer and acrylic;

said interior fluid chamber comprises a chamber draining neck at a first end of said interior fluid chamber;

with said oil sight glass installed with said first exterior end of said interior fluid chamber oriented at the bottom of said interior fluid chamber, said chamber draining neck is configured to drain fluids in said interior fluid chamber into said first fluid opening at said first exterior end of said oil sight glass;

said interior fluid chamber comprises

a cylindrical chamber portion comprising an inner wall being substantially parallel with said central axis, said chamber draining neck, and

a concave indentation between said cylindrical chamber portion and said chamber draining neck; and

said draining neck comprises a chamber neck angle relative to a perpendicular plane from said central axis.

2. The oil sight glass of claim 1, wherein:

and said oil sight glass is connected to the reservoir with either said first exterior end and said second exterior end.

3. The oil sight glass of claim 1, wherein:

an exterior portion of said sight body comprises a hexagonal portion comprising said hex head, and a cylindrical portion comprising a substantially cylindrical shape in said sidewall at second exterior end.

4. The oil sight glass of claim 1, wherein:

said sight body and said hex head are unibody being formed of the same material.

5. The oil sight glass of claim 1, wherein:

said hex head is configured to allow users to tighten and remove said oil sight glass without damaging said oil sight glass since said oil sight glass rotates in its entirety by rotating said hex head.

6. The oil sight glass of claim 1, wherein:

said first fluid opening comprises a first end chamber which leads into said interior fluid chamber, which in turn leads into a second exterior end chamber at said second fluid opening.

7. The oil sight glass of claim 1, wherein: said chamber neck angle comprises 15-30 degrees.

8. The oil sight glass of claim 1, wherein: said chamber neck angle comprises 20 degrees.

\* \* \* \* \*