

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GD ENERGY PRODUCTS, LLC,
Petitioner,

v.

KERR MACHINE COMPANY,
Patent Owner.

PGR2025-00031
Patent 12,152,582 B2

Before CARL M. DeFRANCO, BRENT M. DOUGAL, and
RYAN H. FLAX, *Administrative Patent Judges*.

FLAX, *Administrative Patent Judge*.

DECISION
Granting Institution of Post-Grant Review
35 U.S.C. § 324

I. INTRODUCTION

Kerr Machine Company (“Patent Owner”) is the owner of U.S. Patent 12,152,582 B2 (Ex. 1001, “the ’582 patent”).¹ Paper 4, 1 (Patent Owner’s Mandatory Notices). On February 6, 2025, GD Energy Products, LLC (“Petitioner”) filed a Petition for post-grant review challenging the patentability of claims 1–15 of the ’582 patent (all claims). Paper 1, 1 (“Pet.”); *see also* Paper 5 (Notice of Filing Date on Feb. 28, 2025). A preliminary response was due on May 28, 2025; Patent Owner did not file a preliminary response, nor was it required to do so.

Under 37 C.F.R. § 42.4(a), we have authority to determine whether to institute trial in a post-grant review. We may institute a post-grant review if the information presented in the petition filed under 35 U.S.C. § 321, if unrebutted, shows that it is more likely than not that at least one claim challenged in the petition is unpatentable. 35 U.S.C. § 324(a).

After reviewing the preliminary record, we conclude that Petitioner demonstrates it is more likely than not that it would prevail in showing that at least one challenged claim of the ’582 patent is unpatentable under a

¹ Exhibit 1001, i.e., the challenged ’582 patent, was filed by Petitioner as a PDF document without electronically readable, searchable, and copyable text. This is not the only exhibit submitted in this form, which creates a burden on the Board in analyzing and utilizing the evidence in this proceeding. The Board expects all evidence to be submitted by the parties in an electronically readable, searchable, and copyable form unless doing so is not possible—evidence not so-submitted may be refused. Moreover, Petitioner has added an electronic stamp to each page of its exhibits, including Exhibit 1001. Although such marking may facilitate recognition of an exhibit during review, here it covers a portion of the evidence, again creating a burden on the Board in analyzing the evidence. Obscured evidence may not be considered. The parties are ordered to mitigate these issues in future filings.

presented ground. *See* Pet. Therefore, we grant institution of post-grant review. Our reasoning is discussed below.

A. STANDING

Petitioner states that it

certifies that Foster [(the '582 patent)] is available for PGR [because]: (1) Petitioner is not an owner of Foster, see § 42.201; (2) before the date on which this Petition for review was filed, none of Petitioner or Petitioner's real parties-in-interest or privies filed a civil action challenging the validity of a claim of Foster, see § 42.201(a); and (3) Petitioner, Petitioner's real parties-in-interest or privies are not estopped from challenging the claims on the grounds identified in this Petition, see § 42.201(b).

Pet. 29. This is sufficient.

B. REAL PARTIES-IN-INTEREST

Petitioner states "GD Energy Products, LLC is the real party-in-interest for [the] Petition." Pet. 29. Patent Owner identifies "Kerr Machine Company" as the real party-in-interest. Paper 4, 1.

C. RELATED MATTERS

The parties state that there are no related matters. Pet. 30; Paper 4, 1.

D. THE '582 PATENT AND RELEVANT BACKGROUND

The '582 patent, titled "FLUID END ASSEMBLY," which Petitioner refers to in the Petition as "Foster" (the surname of the first listed inventor), issued on November 26, 2024, from U.S. Application 18/321,054, which was filed on May 22, 2023. Ex. 1001, codes (10), (45), (21), (22). The '582 patent indicates priority to a series of prior applications as continuations, and to an earliest-filed provisional application 62/532,574, filed on July 14, 2017. *Id.* at codes (60), (63). Petitioner does not contest that the '582 patent's claims are entitled to this July 14, 2017, priority date. Pet. 6.

The '582 patent indicates its invention relates to:

A fluid end having its fluid flow bores sealed without threading a retaining nut into the walls of each bore. The fluid ends may be assembled using a plurality of different kits that each comprise a fluid end body, a component, a retainer element, and a fastening system. The retainer element holds the component within each of the bores formed in the fluid end body and the fastening system secures the retainer element to the body.

Ex. 1001, Abstract. A fluid end is a part of an assembly, which the '582 patent states is "typically used in oil and gas operations to deliver[] highly pressurized corrosive an/or abrasive fluids to piping leading to the wellbore." *Id.* at 1:60–62. The '582 patent states that prior art fluid ends were sealed by inserting a plug into each bore and installing a "large retaining nut . . . into each bore above the plug," which "typically thread into internal threads formed in the walls of each bore." *Id.* at 2:6–11. In practice, this presented problems with the retaining nuts backing off or unthreading. *Id.* at 2:12–16. The invention is described as doing away with "threading retaining nuts in[] the walls of each bore," with "no internal threads" in the bores. *Id.* at 2:23–30.

The '582 patent describes several similar embodiments. Figures 7 and 8 of the '582 patent illustrate one embodiment including elements recited by

independent claim 1 (*see* claim reproduced below); we reproduce them below:

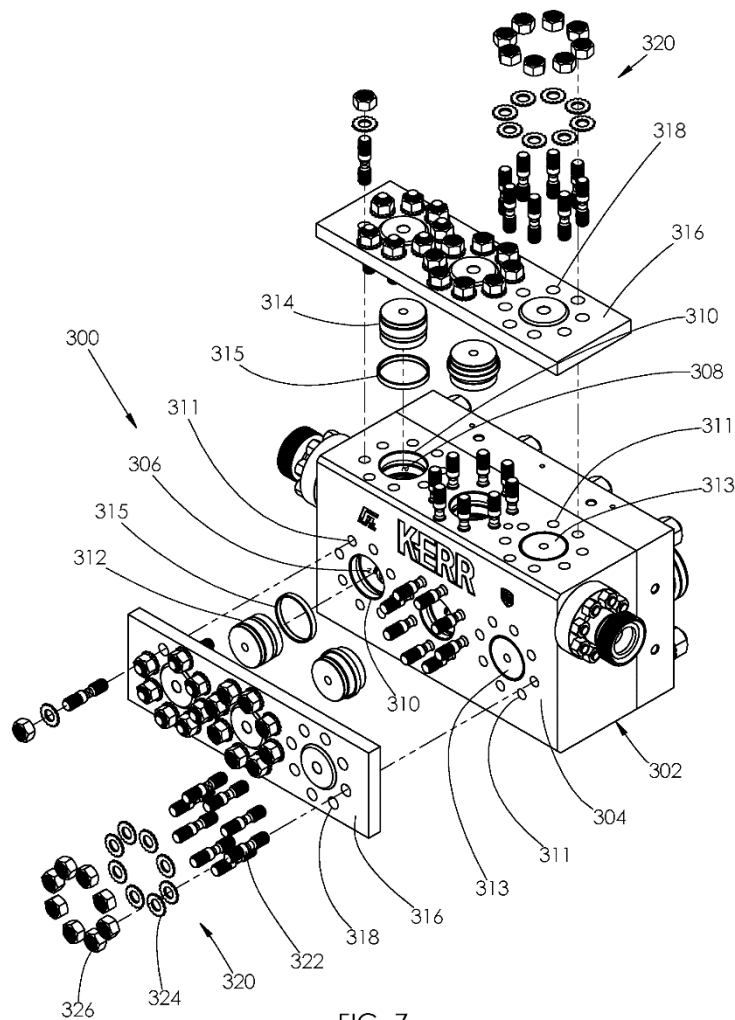


FIG. 7

“FIG. 7 is a partially exploded view . . . of a fluid end” and “shows a suction and discharge end of the fluid end.” *Id.* at 1:35–37. More specifically, Figure 7 shows fluid end 300 as a generally rectangular block, which includes first bores 306 as holes into the side face of the block and second bores 308 as holes into the top face of the block, each bore 306, 308 having an opening 310. *Id.* at 8:13–19. Not shown in this figure is that bores 306, 308 intersect inside fluid end 300. *See, e.g., id.* at 2:35–39, Fig. 3

(reproduced below). Components 312, 314, which are suction and discharge plugs, are shown for insertion into bores 306, 308 and are to be held therein by retaining elements 316, which are rectangular plates. *Id.* at 8:24–51.

Retaining elements 316 are secured to fluid end 300 via fastening system 320, which includes threaded studs 322 to be screwed into threaded openings 322 in fluid end 300 around each opening 310, through respective openings 318 in retaining elements 316, which are to be secured by nuts 326. *Id.* at 8:41–9:7.

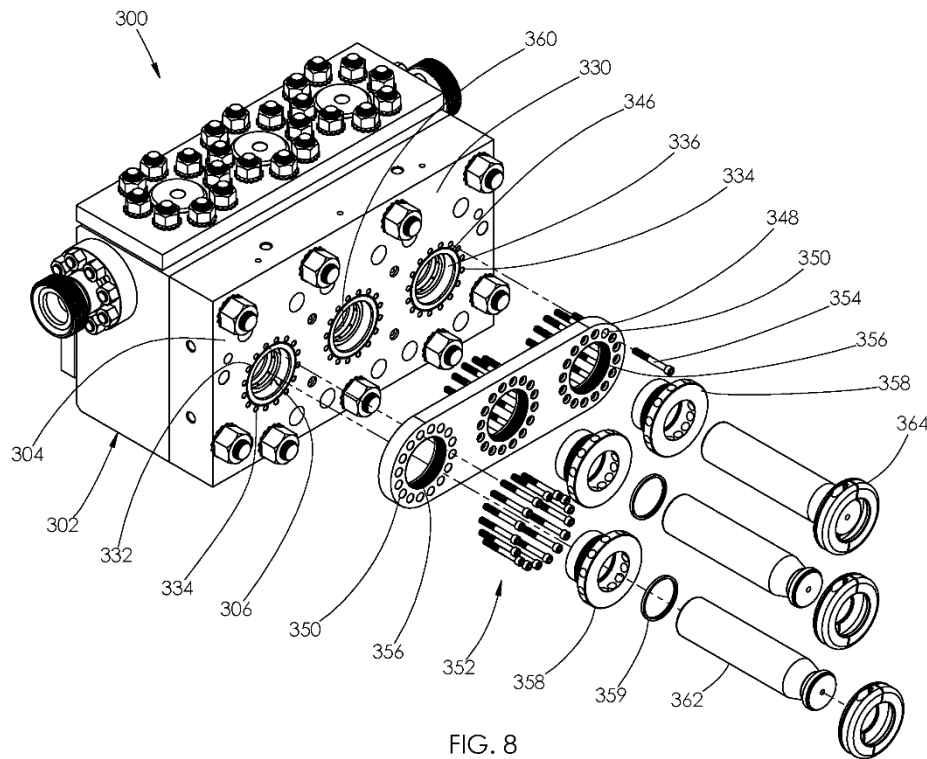


FIG. 8

“FIG. 8 is a partially exploded view of a plunger end of the fluid end body shown in FIG. 7,” hence, Figures 7 and 8 show different perspective views of the same or similar structure, rotated generally 180°. *Id.* at 1:38–39.

Figure 8 shows the opposite side of bores 306, also having openings 332, in which is shown component 336, which is tubular, includes packing seals 360

(not shown), and is sized to receive plunger 362. *Id.* at 9:8–65. In a similar fashion as components 312, 314, components 336 are secured in bores 306 by retainer element 348, which is another plate held to fluid end 300 by similar fastening system 352 composed of screws 354 (rather than studs 322) to be inserted through openings 350 and into threaded openings 334. *Id.*

A cross-section view of a fluid end is shown by Figure 3 below:

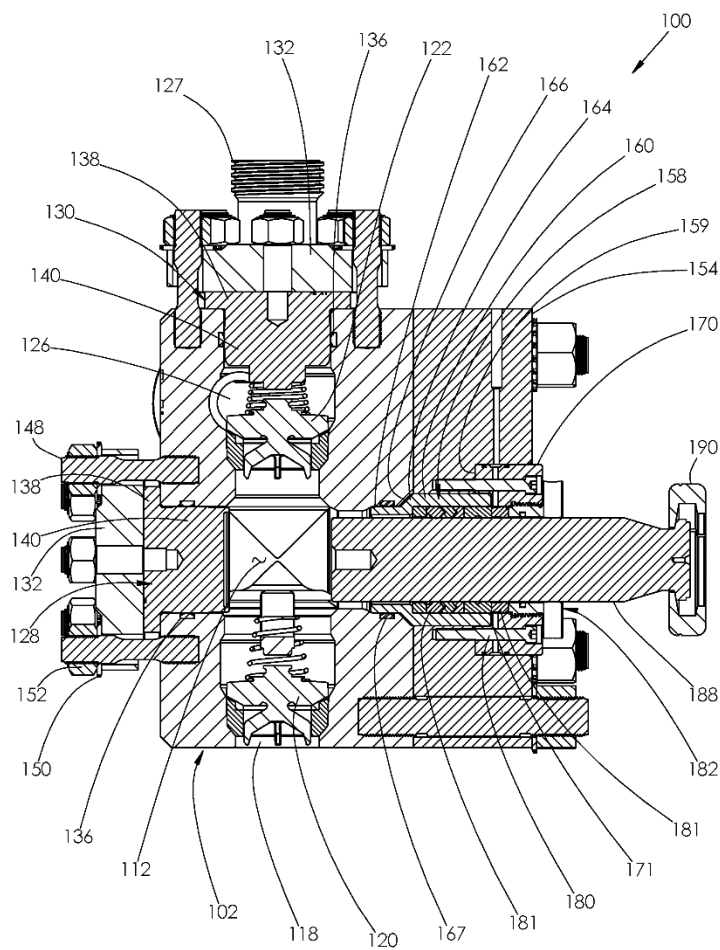


FIG. 3

“FIG. 3 is a cross-sectional view of [a] fluid end” 100 and shows, *inter alia*, intersecting bores 106, 108 (not labeled in figure), plug 128, plunger 188, component 158, seal 167, valves 120, 122, threaded screws 180, retainer

element 170, packing seals 181, and packing nut 182. *Id.* at 2:31–5:41. “The internal functions of the fluid end 300 [shown in Figs. 7 and 8] are identical to those described with reference to fluid end 100, shown in FIG. 3.” *Id.* at 8:21–23. For context, plunger 188 is in horizontal bore 106 and valves 120, 122 are in vertical bore 108. *Id.* at 2:57–58, 5:30–31.

The ’582 patent concludes with fifteen claims, of which claims 1 and 7 are independent claims; claim 1 is representative and is reproduced below:

1. A fluid end assembly, comprising:
 - a housing made of a single, integrally-formed piece and comprising:
 - a first horizontal bore and a first vertical bore formed within the housing, the first vertical bore intersecting the first horizontal bore to form a first internal chamber;
 - a second horizontal bore and a second vertical bore formed within the housing, the second vertical bore intersecting the second horizontal bore to form a second internal chamber;
 - in which the second horizontal bore, the second vertical bore, and the second internal chamber are situated in a side-by-side relationship with the first horizontal bore, the first vertical bore, and the first internal chamber;
 - a first pair of valves, each valve installed within the first vertical bore and positioned on opposite sides of the first internal chamber;
 - a second pair of valves, each valve installed within the second vertical bore and positioned on opposite sides of the second internal chamber;
 - a first plug and a first reciprocating plunger installed within the first horizontal bore and positioned on opposite sides of the first internal chamber;

a second plug and a second reciprocating plunger installed within the second horizontal bore and positioned on opposite sides of the second internal chamber;

a plate fastened to the housing along an exterior surface containing openings to the first and second horizontal bores;

a first component having a central opening formed therein, at least a portion of the first component installed within the first horizontal bore and at least a portion of the first reciprocating plunger installed within the central opening of the first component;

a first plurality of packing seals installed within the first component and engaging the first reciprocating plunger; and

a first packing nut attached to the first component and holding the first plurality of packing seals within the first component.

Ex. 1001, 16:14–18:50 (claims). The record indicates that Patent Owner has statutorily disclaimed claim 15, as of April 28, 2025. Ex. 2206.

E. PETITIONER’S ASSERTED GROUNDS FOR UNPATENTABILITY

Petitioner asserts the following grounds for unpatentability:²

Ground	Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–14	103	Kerr ³
2	1–14	103	Aplex, ⁴ Stanton ⁵

² Petitioner’s fifth ground for unpatentability challenged only claim 15 under 35 U.S.C. § 112 for indefiniteness. Pet. 31. Because claim 15 is statutorily disclaimed by Patent Owner, the ground is dismissed as moot. *See* Ex. 2106.

³ Kerr Pump Corporation, Service Manual: Kerr KP-3300HP Plunger Pump, dated March 10, 2006. Ex. 1004 (“Kerr”).

⁴ Dupagro B.V., Manual: SC-65 Triplex Plunger Pump, Rev. Feb. 21, 2006. Ex. 1005 (“Aplex”).

⁵ Eddie N. Stanton and Michael L. Strickland, US 2005/0200081, pub. Sept. 15, 2005. Ex. 1007 (“Stanton”).

Ground	Claims Challenged	35 U.S.C. §	Reference(s)/Basis
3	1–14	103	Blume, ⁶ Stanton, Wilkinson ⁷
4	1–14	103	sale of “Kerr Pump” ⁸

Id. In support of these grounds for unpatentability, Petitioner submits, *inter alia*, the Declaration of William D. Marscher, P.E. (Ex. 1003). Patent Owner has not submitted a similar witness declaration as evidence.

II. DISCUSSION

A. LEGAL STANDARDS CONCERNING PATENTABILITY

“In a[] [post-grant review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic*, 815 F.3d at 1363 (citing 35 U.S.C. § 312(a)(3), requiring petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim,” which is also applicable to § 322(a)(3)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in AIA review proceedings). A post-grant review may be instituted if the information presented by a petitioner in the petition, if not rebutted, shows that it is more likely than not that the petitioner would prevail with respect to at least one of the claims challenged in the petition. 35 U.S.C. § 324.

⁶ George H. Blume, US 7,186,097 B1, issued Mar. 6, 2007. Ex. 1006 (“Blume”).

⁷ Bruce S. Wilkinson, US 4,773,833, issued Sept. 27, 1988. Ex. 1008 (“Wilkinson”).

⁸ Petitioner asserts the “Kerr Pump” is a product identified in a “spec sheet” as KP-3300HP, offered for sale as of December 28, 2014. Ex. 1011.

All grounds at issue are based on obviousness. The Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), reaffirmed the framework for determining obviousness set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966). The *KSR* Court summarized the four factual inquiries set forth in *Graham* (383 U.S. at 17–18) that are applied in determining whether a claim is unpatentable as obvious under 35 U.S.C. § 103(a) as follows: (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art;⁹ and (4) considering objective evidence indicating obviousness or non-obviousness.¹⁰ *KSR*, 550 U.S. at 406.

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 416. “[W]hen the question is whether a patent claiming the combination of elements of prior art is obvious,” the answer depends on “whether the improvement is more than the predictable use of prior art elements according to their established functions.” *Id.* at 417.

A product alleged to be offered for sale before the ’582 patent’s priority date is also asserted as prior art in this proceeding. The on-sale bar is not limited solely to products that anticipate a patent’s claims, it also applies if “the subject matter of the sale or offer to sell . . . would have rendered the claimed invention obvious by its addition to the prior art.” *Pfaff v. Wells Elecs., Inc.*, 124 F.3d 1429, 1436 (Fed. Cir. 1997) (quoting *UMC Elecs. Co. v. United States*, 816 F.2d 647, 656 (Fed. Cir. 1987)).

⁹ See *infra* Section II.B.

¹⁰ At this stage of the proceeding, there is no evidence of objective indicia of obviousness or non-obviousness.

Under such an unpatentability theory, what was offered for sale before a critical date becomes “a [prior art] reference under section 103 against the claimed invention.” *Id.* (quoting *Baker Oil Tools v. Geo Vann, Inc.*, 828 F.2d 1558, 1563 (Fed. Cir. 1987)).

B. ORDINARY LEVEL OF SKILL IN THE ART

Petitioner contends (unopposed at this point):

The person of ordinary skill in the art would have a minimum of a bachelor’s degree in mechanical or petrochemical engineering, or a comparable engineering discipline, and a minimum of 3-5 years of work experience in the design and/or manufacturing of reciprocating pumps and valves, including fluid ends and/or comparable high pressure fluid components, for industrial applications, including for use in the oil and gas industry. *See, e.g.*, EX1003, ¶32.

Pet. 31.

At this stage of the proceeding, we accept and use Petitioner’s proposed and unopposed definition of the ordinarily skilled artisan. It appears that Petitioner’s proposed definition comports with the level of skill in the art reflected in the prior art of record and the ’582 patent, itself. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (“the prior art itself [may] reflect[] an appropriate level” as evidence of the ordinary level of skill in the art) (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)).

C. CLAIM CONSTRUCTION

Our claim construction positions herein are preliminary. Further argument by the parties is permitted. Petitioner states that “[f]or purposes of this Petition, Petitioner submits that all claim terms in the Challenged Claims should be given their ordinary and customary meaning as understood by the POSITA and no further construction is necessary at this time.”

Pet. 31.

“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). At this point, we decline to expressly construe any claim language for purposes of rendering this Institution Decision. If either party intends to argue claim construction at trial, they may but should do so in a clearly designated section of their briefing so as to expressly identify such arguments. *See, e.g.*, 37 C.F.R. § 42.204(b)(3) (content of petition); *see also* Board’s Consolidated Trial Practice Guide (CTPG), 84 Fed. Reg. 64,280, at 46, 48–45 (Nov. 2019).¹¹ Claim construction arguments should not be relegated to patentability arguments on the facts.

D. PETITIONER’S ASSERTED PRIOR ART

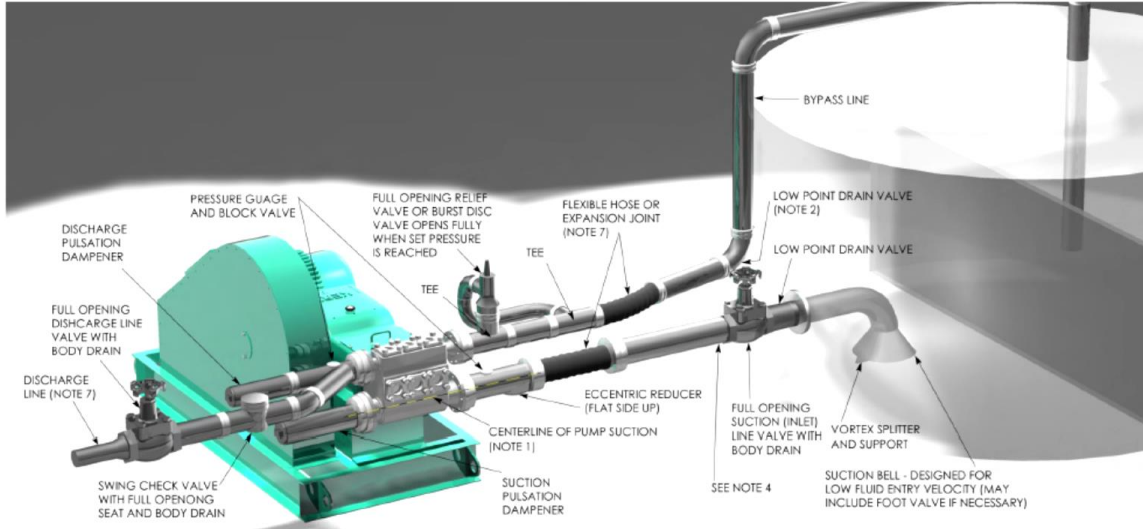
We review and summarize Petitioner’s asserted prior art references below. There is currently no dispute that each constitutes prior art.

1. Kerr (Ex. 1004)

Kerr is a service manual for a Kerr KP-3300HP Plunger Pump, indicating on its face to have been produced by Kerr Pump Corporation as an “eighteenth edition,” and (internally) bearing a date of March 10, 2006. Ex. 1004, 1, 13–16 (we refer to the page numbering added by Petitioner at the lower right corner of each page). Petitioner asserts that Kerr is prior art. Pet. 10, 23–29 (citing Ex. 1003 ¶¶ 64, 69; Ex. 1009); *see also* Ex. 1003 ¶ 63 (asserting “Kerr was publicly available no later than March 17, 2016”).

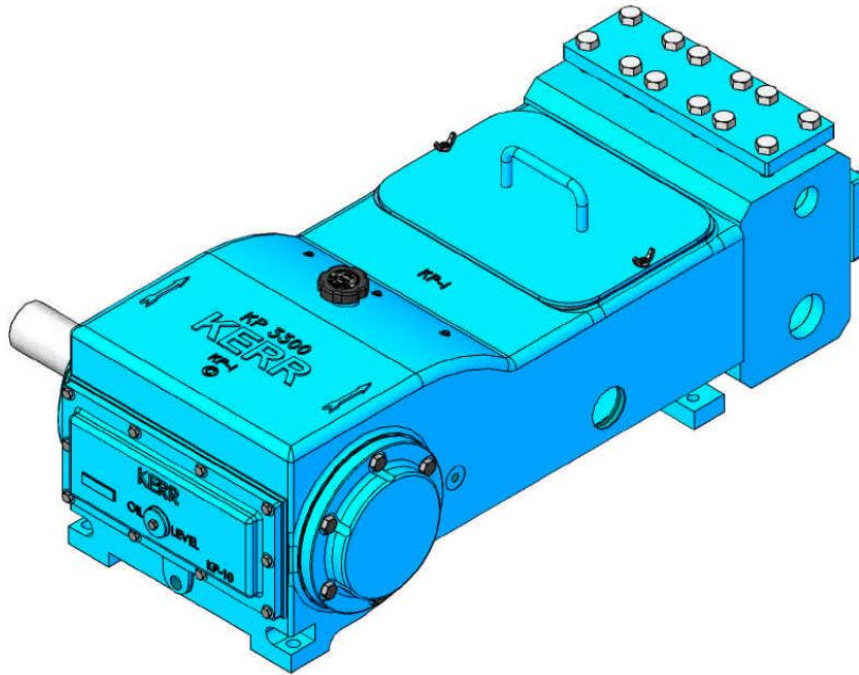
Kerr discloses a plunger pump for pumping fluid and illustrates a system in the image reproduced below:

¹¹ Available at www.uspto.gov/TrialPracticeGuideConsolidated. Familiarity with the Trial Practice Guide is expected.



The illustration above shows a pump mechanism (green) having a pump portion (a power end) connected to a fluid end (silver, labeled “centerline of pump suction”) for a suction inlet, which is connected via plumbing on one side to a fluid reservoir (partial cylindrical tank) and on the opposite the side to a discharge line and a “suction pulsation dampener.” Ex. 1004, 6, 12.

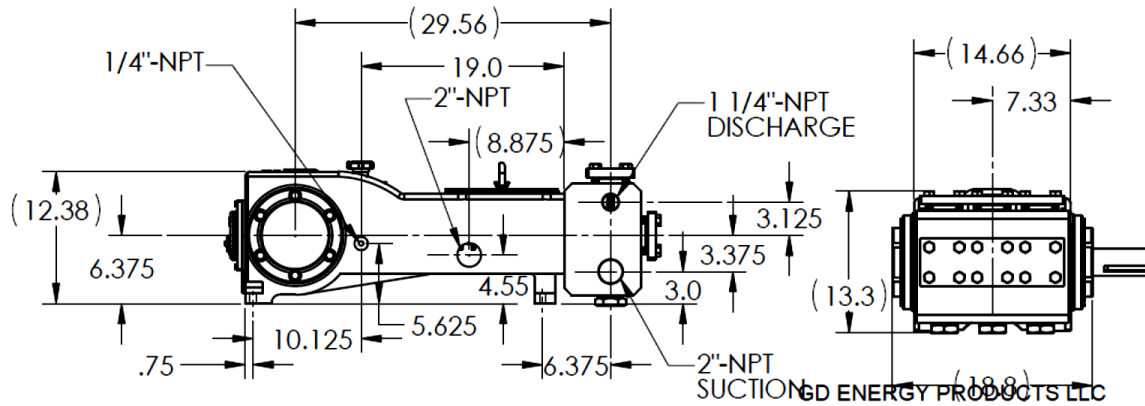
Kerr also provides the following illustration of the pump's power and fluid ends:



KP-3300HP

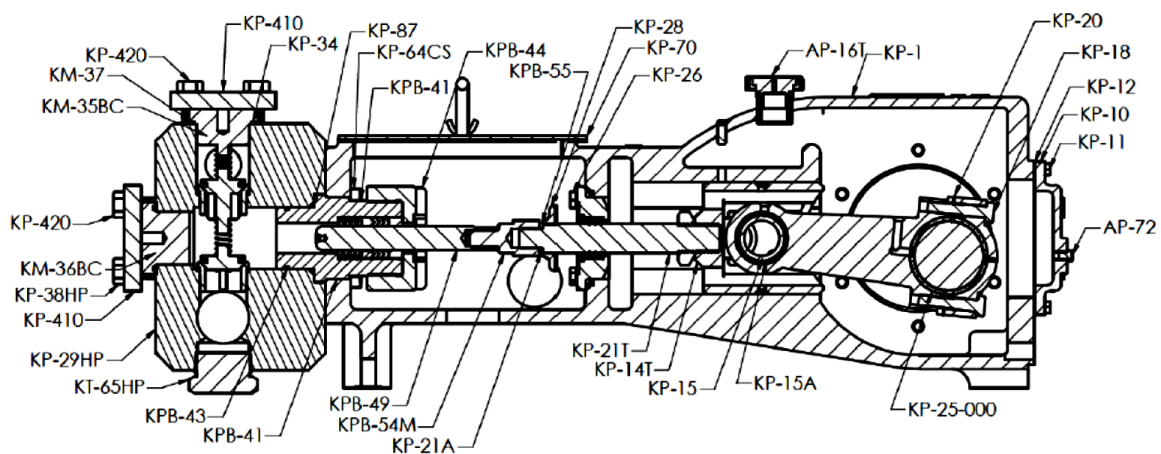
The image above shows a perspective illustration of a KP-3300HP pump, colored blue; the power end is shown nearer in the image and the fluid end is shown farther away in the image. *Id.* at 24. A rectangular plate is illustrated as bolted to the top of the fluid end, and the edge of what appears to be a similar plate, and two bolts is shown along the far side of the fluid end. *Id.*

Schematic side and end views of the KP-3300HP pump are also disclosed; they are reproduced below:



The image above shows a schematic side view of the pump (at left) and an end view from the end of the fluid end (at right), denoting the dimensions of the components. *Id.* at 25. The figure shows that the power end and fluid end are connected on one side of the fluid end. *Id.* The fluid end is illustrated as having rectangular plates bolted to the top and end sides thereof. *Id.*

A 180° horizontally rotated cross-section view of the structure shown in the image at left above is also disclosed; it is reproduced below:

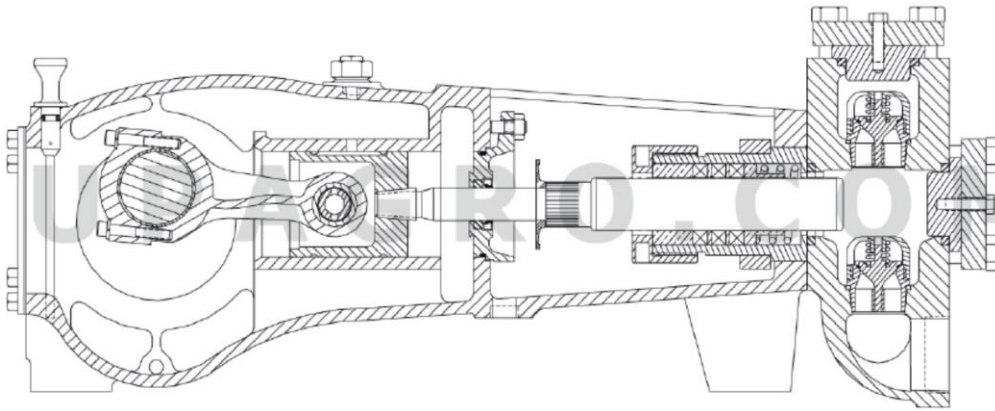


The figure above shows a cross-section view of the KP-3300HP plunger type pump and shows that the power end (right side, KP-1 (pump case)) includes a crankshaft, which is connected to a rod and thereby to a piston (KPB-49), which is shown partially within a horizontal bore portion of the fluid end (left side, KP-29HP (fluid end vessel)) and within an assembly of generally cylindrical parts (KPB-41, KPB-43, KPB-44, KPB-58) in/on the horizontal bore of the fluid end, and a cap screw (KP-64CS). *Id.* at 27–34. The fluid end is shown as having intersecting bores, one vertical and one horizontal, each capped to the exterior and covered by a rectangular plate (KP-410 (top and end plug cover plate) over the exterior of the fluid end, secured thereto by screws (KP-420). *Id.* at 27–34. Valves (KM-96 (discharge), KM-97 (suction) (not labeled) are provided in the vertical bore. *Id.* at 27.

2. Aplex (Ex. 1005)

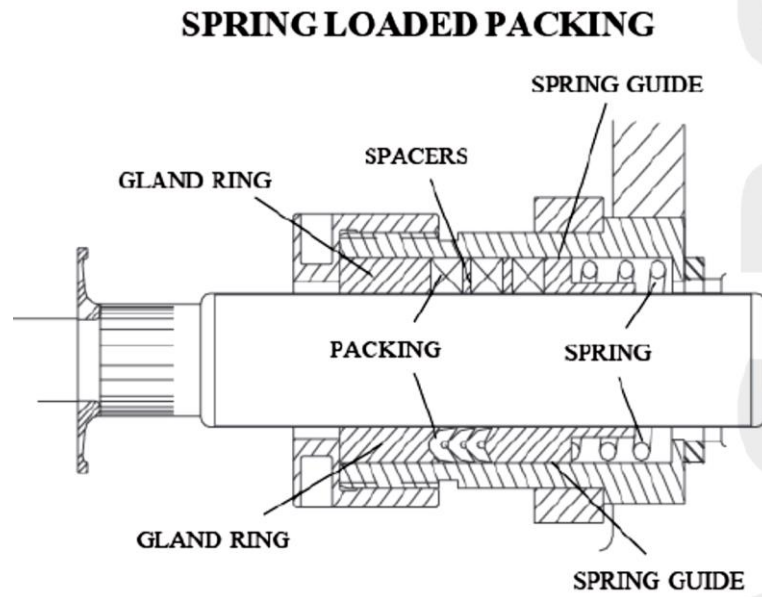
Aplex is a manual for an “SC-65 Triplex Plunger Pump,” is indicated as having been produced by Dupagro, Myers/Aplex Industries, Inc., or Aplex, Inc., and (internally) bears a date of February 21, 2006. Ex. 1005, 1, 4, 6 (we cite the page numbering added by Petitioner at the lower right corner of each page). Petitioner asserts that Aplex was available in 2016, e.g., it is prior art. Pet. 17, 19, 23–29 (citing Ex. 1003 ¶¶ 64, 69; Ex. 1009); *see also* Ex. 1003 ¶ 68 (asserting “Aplex is prior art”).

Aplex includes a cross-section drawing of a pump, which we reproduce below:



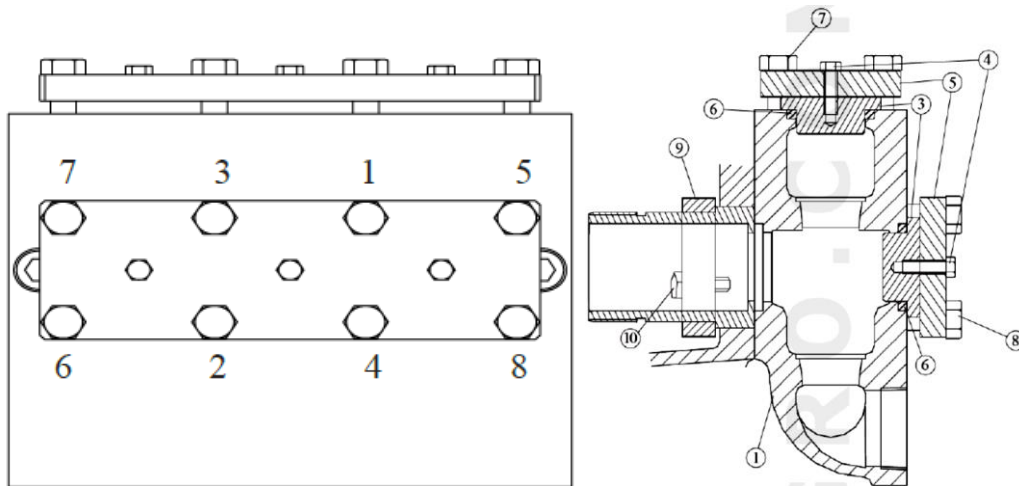
Id. at 7. The image above appears to show a power end (left) of a pump, connected to a fluid end (right, Aplex also calls it a “liquid” end). *Id.*; see also *id.* at 13 (image depicting the pump connected to a system including plumbing to a fluid reservoir and a discharge line). The power end is depicted as including a crank and rod, connected to a piston, which is shown partially within a horizontal bore of the fluid end, which intersects with a vertical bore therein, which includes valve structures above and below that intersection point. *Id.* at 7. The exterior openings of the bores appear to be capped with rectangular (in cross-section) plates, held to the fluid end via screws. *Id.*

Aplex includes a figure depicting a closer cross-section view of the plunger and a system of rings and packing holding it in the system, which we reproduce below:



The figure above shows the pump's plunger held within a "replaceable stuffing box[]," which includes a spring, a spring-guide ring, spring loaded packing (3 rings), and a gland ring. *Id.* at 22. A support ring and a follower (between the packing, not labeled in this figure), and a gland nut (left-end of the assembly, not labeled in this figure), are also provided. *Id.* at 23; *see also id.* at 43–46 (also illustrating the stuffing box and plunger).

Aplex discloses that stuffing boxes "are retained by large bolts which extend through the liquid end, serving to clamp the box tightly against the fluid end face," and illustrates this in the following figures:



Id. at 23–24, 38. The figures above show a block, understood to be the pump’s fluid end, from an end view (left) and from a side cross-section view (right) rotated 90° from the first image, where the block has a rectangular retainer plate affixed to its end and one affixed to its top, each held by 8 hex-capped screws. *Id.* These plates (5) are positioned over the outsides of the vertical and horizontal bores and cover head plugs (3) in the bores. *Id.* at 38.

Aplex also discloses two types of valve assemblies to be used with its pump. *Id.* at 25. These valves are illustrated as provided in a vertical bore of the fluid end on either side of its intersection with the horizontal bore. *Id.* at 7, 21.

3. Stanton (Ex. 1007)

Stanton, titled “PACKING PCARTRIDGES AND PRESSURE-DAMPENING ELEMENTS FOR PLUNGER-TYPE PUMPS,” is the September 15, 2005 publication of U.S. Application 10/798,693, which was filed on March 11, 2004. Ex. 1007, codes (21), (22), (43), (54). Petitioner asserts that Stanton is prior art. Pet. 18; *see also* Ex. 1003 ¶ 74 (asserting “Stanton is prior art”).

Regarding its invention, Stanton states:

A package cartridge is provided for use in the maintenance of a packing bore for a plunger-type pump. According to one aspect, a packing cartridge includes; a generally-cylindrical sleeve adapted to be at least partially positioned in the packing bore, a first abutment ring positioned in the sleeve, and a second abutment ring positioned in the sleeve and co-axially spaced apart from the first abutment ring. Telescoping structures are operatively positioned between the first abutment ring and the second abutment ring. According to another aspect, a structure forming a circumferential pressure-ring groove is provided. A pressure ring is positioned in the pressure-ring groove, the pressure ring having at least one smaller external dimension than an internal dimension of the pressure-ring groove, whereby at least one clearance is provided between the pressure-ring groove and the pressure ring. These aspects can be advantageously practiced together.

Ex. 1007, Abstract.

4. Blume (Ex. 1006)

Blume, titled “PLUNGER PUMP HOUSING AND ACCESS BORE PLUG,” issued on March 6, 2007, from U.S. Application 10/662,578, which was filed on September 15, 2003. Ex. 1006, codes (21), (22), (45), (54).

Petitioner asserts that Blume is prior art. Pet. 21; *see also* Ex. 1003 ¶ 72 (asserting “Blume is prior art”).

Blume states its invention relates to:

Suction valve spring retainers mounted using an access bore plug are described for use in plunger pump housings having an offset access bore and incorporating structural features for stress-relief. These pump housing structural features accommodate access bore plugs that secure suction valve spring retainers that are internally located substantially centrally over the suction bore transition area of the plunger pump housing. Access bore plugs are secured in place on the pump housing using one or more threaded retainers. Plunger pumps so constructed are relatively resistant to fatigue failure because of stress-reducing structural features, and they may incorporate a variety of valve styles, including top and lower stem-guided

valves and crow-foot-guided valves, in easily-maintained configurations. Suction valve spring retainers mounted in plunger pump housings may also incorporate a suction valve top stem guide. Further, certain structural features of access bore plugs may be dimensioned to aid in improving volumetric efficiency of the pumps in which they are used.

Ex. 1006, Abstract.

Blume illustrates a (then) prior art fluid end bulkhead of a plunger pump at Figure 1, which we reproduce below:

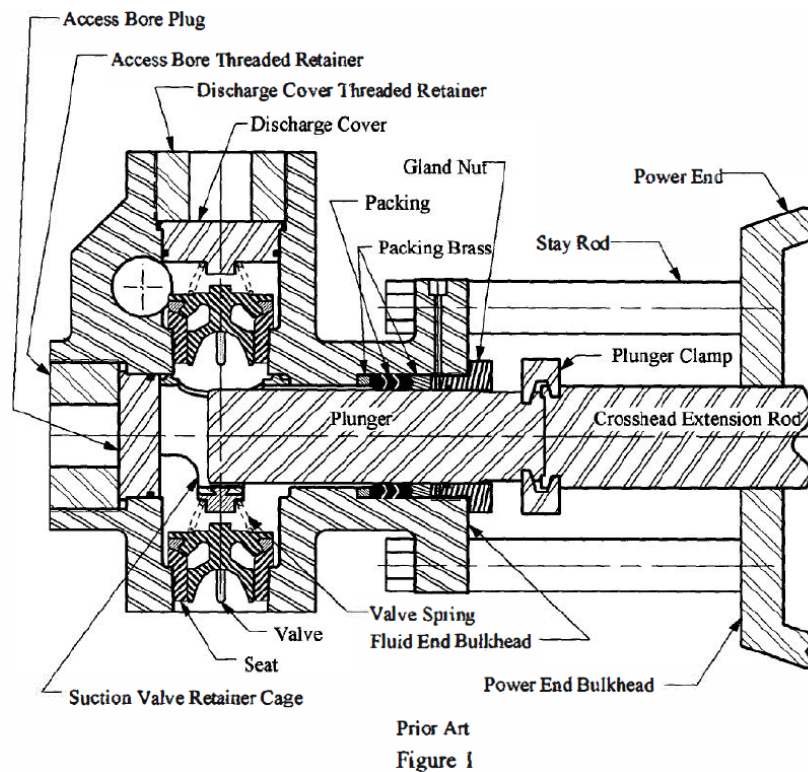


Figure 1 shows fluid end bulkhead connected to power end bulkhead of a plunger pump, which Blume identifies as a “Triplex fluid section design.” *Id.* at 1:18–31. Extending from a rod from the power end is a plunger, which extends into a horizontal bore in the fluid end. The horizontal bore intersects a vertical bore, which has a valve on either side of the intersection. Surrounding the plunger in the horizontal bore are packing, packing brass,

and a retaining gland nut. *See id.* at 2:4–23, Fig. 6. A discharge cover and discharge cover threaded retainer close the outer opening of the vertical bore and an access bore plug and access bore threaded retainer close the outer opening of the horizontal bore.

5. Wilkinson (Ex. 1008)

Wilkinson, titled “HIGH PRESSURE HOMOGENIZER PUMP,” issued on September 27, 1988, from U.S. Application 37,560, which was filed on April 13, 1987. Ex. 1008, codes (21), (22), (45), (54). Petitioner asserts that Wilkinson is prior art. Pet. 22; *see also* Ex. 1003 ¶ 76 (asserting “Wilkinson is prior art”).

Regarding its invention, Wilkinson states:

A homogenizer comprises a homogenizing valve mounted to a pump block. Sets of three suction valves and discharge valves are positioned in valve bores in opposite faces of the block. Each of the valve bores has a hemispherical termination. The hemispherical termination of a pump chamber is formed in an adjacent surface of the block and is in communication with the valve bores through oblique conduits. The pump cylinder is formed in a packing box mounted in the block by bolts extending through the block. Integral valve assemblies removable as units are positioned in the valve bores. A pressure sensor is coupled to a discharge manifold through an isolating piston.

Ex. 1008, Abstract.

Wilkinson illustrates such a pump assembly at Figure 1, reproduced below:

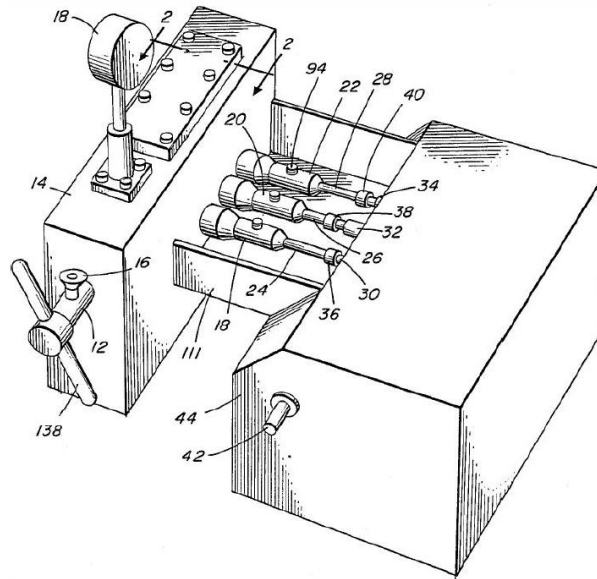


FIG. 1

“FIG. 1 is a perspective view of a homogenizer valve and pump assembly,” and shows pump block 14 integrated with three plungers 24, 26, 28, connected to respective drive shafts 30, 32, 34, driven by an electric motor in box 44. *Id.* at 2:65–66, 3:8–25. Not illustrated are respective suction and discharge valves in the pump block for the three pump plungers, which are accessible behind plate 44. *Id.* 3:25–29; *see id.* Figs. 2, 4.

6. Kerr Pump (e.g., Ex. 1011)

Petitioner asserts that a product identified as KP-3300HP pump was publicly offered for sale by Kerr Machine Co. no later than December 28, 2014, as evidenced by its inclusion as a sale item on Kerr’s website before this date. Pet. 143 (citing Ex. 1009). Petitioner asserts that the Kerr Pump is detailed in a Kerr “spec sheet,” of record at Exhibit Ex. 1011. *Id.* at 144.

The Kerr spec sheet includes images and specification for the KP-330HP 76.6 BHP Triplex Plunger Pump, Intermittent Duty. Ex. 1011, 1.

The Kerr spec sheet includes images that are basically the same as those provided in Exhibit 1004 (Kerr), discussed above, without showing the pump in any cross-sectioned views. *Compare* Ex. 1011 *with* Ex. 1004.

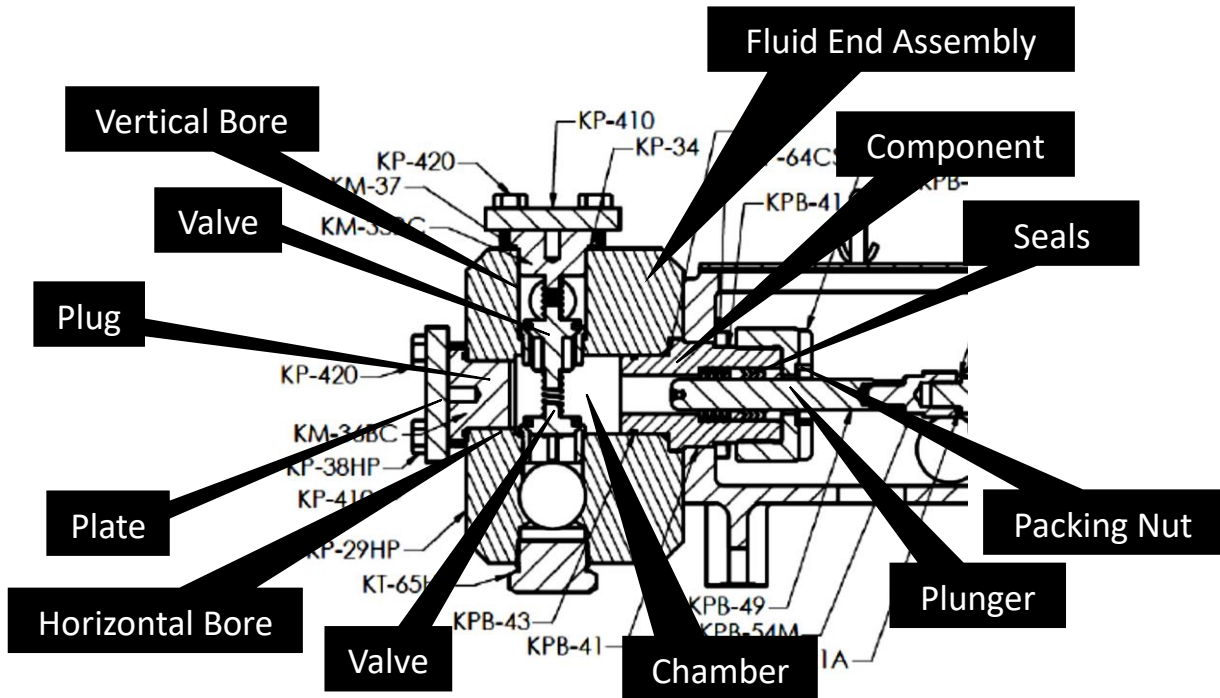
E. GROUND 1—ALLEGED OBVIOUSNESS OVER KERR

Under Ground 1, Petitioner asserts that claims 1–14 would have been obvious over Kerr and, therefore, are unpatentable. Pet. 31–65 (citing Ex. 1001, 4:15–16, 6:66–67, 9:17–20, 11:2–4, Fig. 2; Ex. 1003 ¶¶ 79–171; Ex. 1004, 12, 20, 25–27, 29, Figs.).

As noted above, Patent Owner did not file a preliminary response and, at this stage of the proceeding, offers no opposition to the Petition’s merits.

To generally summarize the invention of independent claim 1, the claim is directed to a fluid end assembly having a single, integrally-formed housing with a pair of side-by-side, intersecting vertical and horizontal bores, each vertical bore having a pair of valves on either side of a respective chamber defined by the bore intersection, and each horizontal bore’s exterior opening being closed with a plug and the two openings fastened with a plate, and one of the horizontal bores has a component around the plunger and seals, held in via a packing nut. *See* Ex. 1001, 16:14–55.

Petitioner asserts that Kerr teaches such a fluid end and maps its disclosure to claim 1. Pet. 32–47 (citing Ex. 1001, 4:15–16, 6:66–67, 9:17–20, 11:2–4; Ex. 1003 ¶¶ 79–104; Ex. 1004, 12, 25, 27, 29). Petitioner’s assertions include far greater detail, but we will summarize its assertions as to how Kerr teaches or suggested each element of claim 1 using the following annotated figure from Kerr:



We label a portion of Kerr’s figure from page 27 of the reference (*see supra* Section II.D.1 for the entire image), focusing on the fluid end illustrated, and annotating the figure to identify the components of Kerr’s fluid end as Petitioner has mapped them to the elements of claim 1. *See id.*; *see also generally* Ex. 1004. As for claim 1’s requirement that there be two sets of such horizontal and vertical bores provided side-by-side (as well as the bores’ valves) and the claim’s requirement that the plate cover the respective openings of adjacent horizontal bores, Petitioner asserts such is shown in Kerr’s photographs, for example, at pages 20–23. *See* Pet. 36–41, 42–43.

At this point, none of Petitioner’s assertions is contested. On this record, we agree with Petitioner that Kerr appears to teach or suggest each and every element of claim 1. In view of our preliminary conclusions, we find that Petitioner has shown under Ground 1 that it is more likely than not that at least claim 1 of the ’582 patent’s claims would have been obvious over Kerr.

Although we do not address claims 2–14 here, trial is instituted on all grounds and all claims. Petitioner’s challenges to the patentability of these other claims, as well as claim 1, will be addressed in any final written decision in this proceeding.

F. GROUND 2, 3, AND 4—ALLEGED OBVIOUSNESS OVER APLEX AND STANTON, OVER BLUME, STANTON, AND WILKINSON, OR OVER THE SALE OF THE KERR PUMP

Petitioner also presents Ground 2 alleging the obviousness of claims 1–14 over Aplex and Stanton, Ground 3 alleging these claims would have been obvious over Blume, Stanton, and Wilkinson, and Ground 4 alleging these claims would have been obvious over the Kerr Pump offered for sale before the priority date. Pet. 31, 65–145 (citing, *inter alia*, Ex. 1003 ¶¶ 172–393). Because we determine that Ground 1, as discussed above, warrants institution, we do not address the merits of these other grounds at this point, but they are included in the instituted review. *See* 37 C.F.R. § 42.208(a). Grounds 2–4 will be addressed in any final decision in this proceeding. We do, however, note that, in our initial review of these grounds and the supporting evidence of record, we find no glaring flaws in Petitioner’s assertions or reasoning.

III. CONCLUSION

On the record before us, Petitioner has demonstrated that it is more likely than not that at least one challenged claim of the ’582 patent will be shown to be unpatentable at trial under at least one ground. Accordingly, we institute a post-grant review of the challenged claims of the ’582 patent on all grounds alleged by Petitioner. This decision does not reflect a final determination on the patentability of the claims.

ORDER

Accordingly, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 324, post-grant review of claims 1–14 of the '582 patent, in accordance with each ground of challenge in the Petition, is hereby *instituted*; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 324(c) and 37 C.F.R. § 42.4(b), post-grant review of the '582 patent will commence on the entry date of this Decision, and notice is hereby given of the institution of a trial.

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