



US009500195B2

(12) **United States Patent**
Blume

(10) **Patent No.:** **US 9,500,195 B2**

(45) **Date of Patent:** **Nov. 22, 2016**

(54) **INTEGRATED DESIGN FLUID END SUCTION MANIFOLD**

(71) Applicant: **George H Blume**, Austin, TX (US)

(72) Inventor: **George H Blume**, Austin, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 223 days.

(21) Appl. No.: **14/078,366**

(22) Filed: **Nov. 12, 2013**

(65) **Prior Publication Data**

US 2014/0137963 A1 May 22, 2014

Related U.S. Application Data

(60) Provisional application No. 61/727,289, filed on Nov. 16, 2012.

(51) **Int. Cl.**

F04B 53/16 (2006.01)
F04B 9/109 (2006.01)
F04B 23/06 (2006.01)
F04B 53/10 (2006.01)

(52) **U.S. Cl.**

CPC **F04B 53/16** (2013.01); **F04B 9/1095** (2013.01); **F04B 23/06** (2013.01); **F04B 53/10** (2013.01); **Y10T 137/86083** (2015.04)

(58) **Field of Classification Search**

CPC F04B 9/109; F04B 9/1095; F04B 15/04; F04B 23/06; F04B 53/16
USPC 417/62, 521, 568, 557, 273
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,366,814	A	1/1945	Smith	
3,146,724	A	9/1964	Davidson	
4,032,265	A	6/1977	Miller	
4,129,324	A	12/1978	Jones, Jr.	
4,445,829	A	5/1984	Miller	
4,456,440	A	6/1984	Korner	
4,512,368	A	4/1985	Kaminaka et al.	
4,585,400	A	4/1986	Miller	
4,712,578	A	12/1987	White	
5,311,904	A	5/1994	Beppu	
5,334,352	A	8/1994	Johnson	
5,474,102	A	12/1995	Lopez	
5,575,262	A	11/1996	Rohde	
5,765,814	A	6/1998	Dvorak et al.	
5,960,827	A	10/1999	Rosenberg	
6,418,909	B2	7/2002	Rossi et al.	
7,506,574	B2*	3/2009	Jensen	F04B 53/007 417/454
7,621,728	B2	11/2009	Miller	
2002/1018660		8/2002	Braun et al.	
2010/0322803	A1*	12/2010	Small	F04B 53/16 417/454

* cited by examiner

Primary Examiner — Devon Kramer

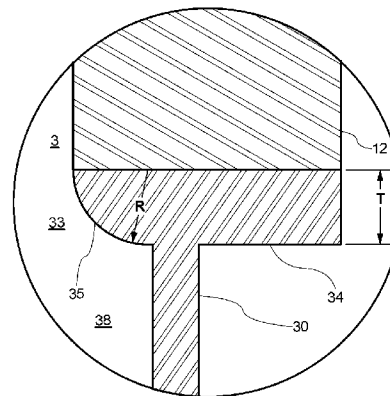
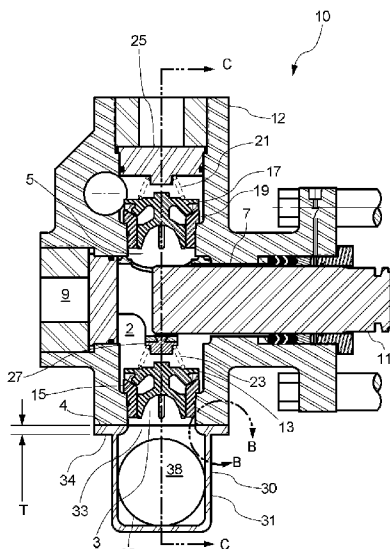
Assistant Examiner — Chirag Jariwala

(74) *Attorney, Agent, or Firm* — Gary W. Hamilton

(57) **ABSTRACT**

A fluid end assembly comprising a housing, valve bodies, seals, seats, springs, and other associated parts, paired with a suction manifold that facilitates bi-directional fluid flow. The suction manifold of this invention is designed to preserve fluid energy that will ensure complete filling of the cylinder in extreme pumping conditions. The suction manifold utilizes a chamber design positioned immediately below the suction valves, eliminating all connecting ducts. Alternate embodiments of this invention include a suction manifold with an integral fluid dampeners or stabilizers.

4 Claims, 14 Drawing Sheets



Enlarged Area "B-B" of Figure 6A

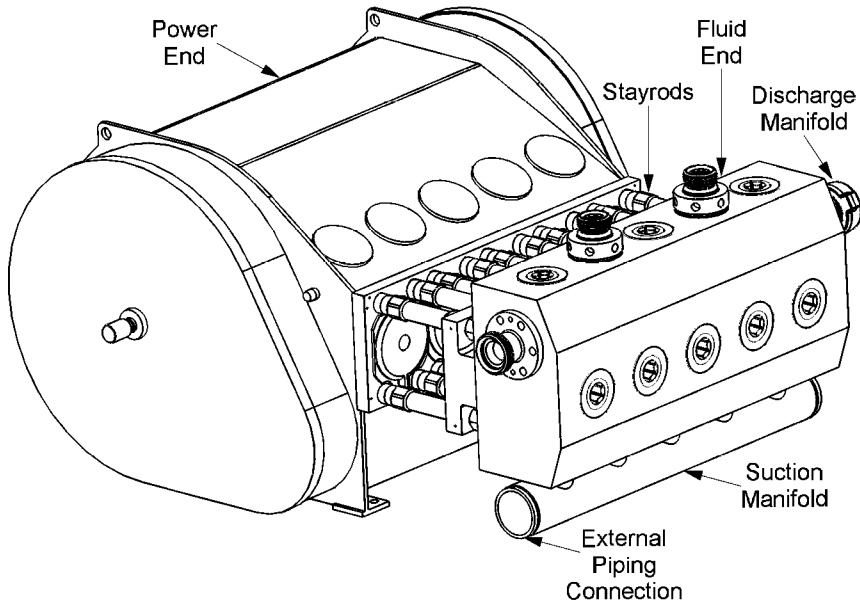


Figure 1

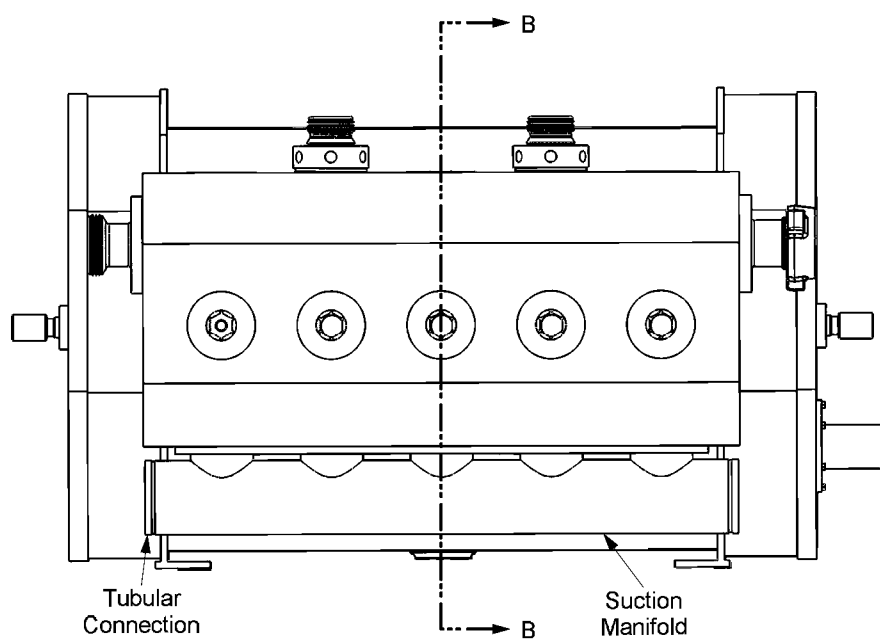


Figure 2A

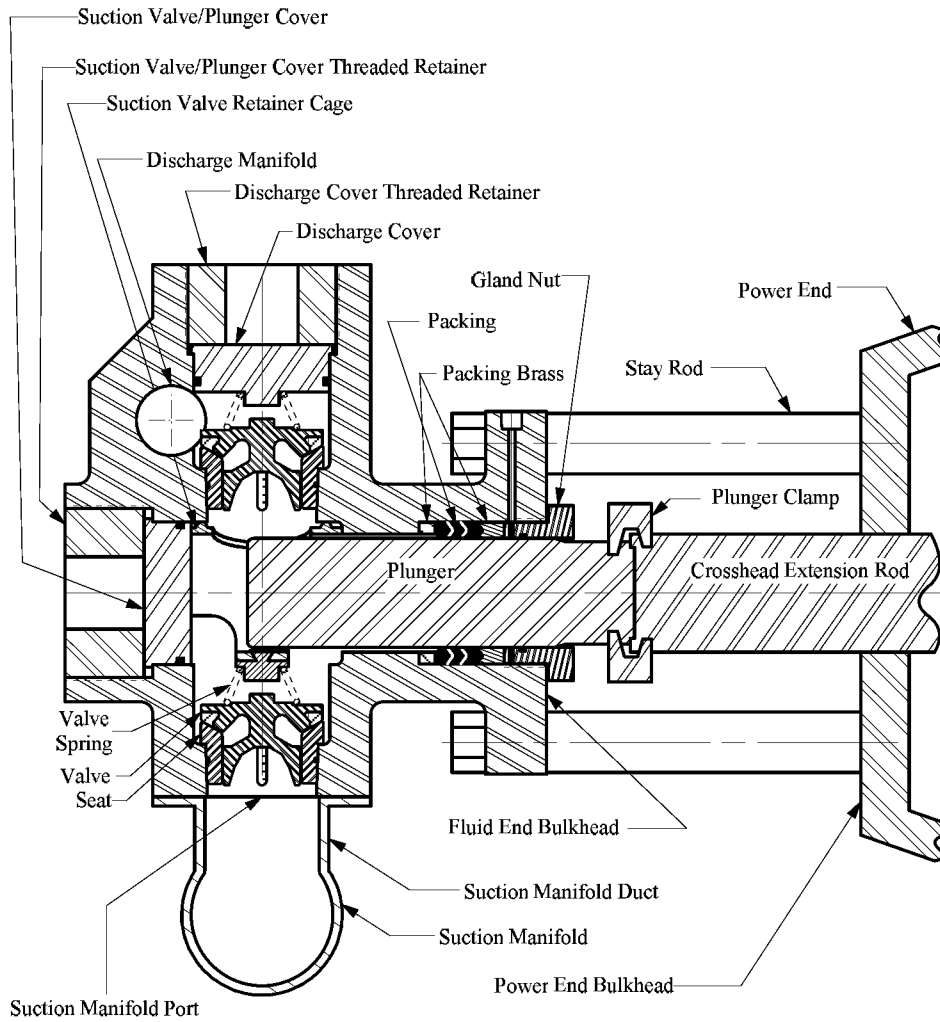


Figure 2B

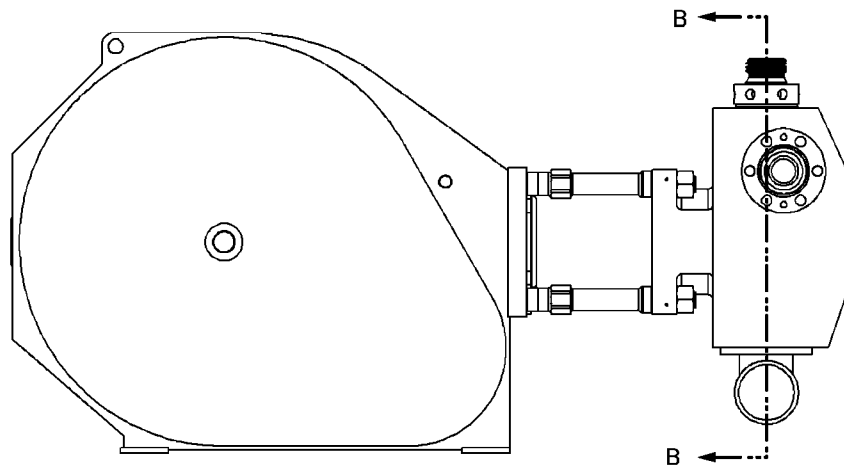


Figure 3A

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.