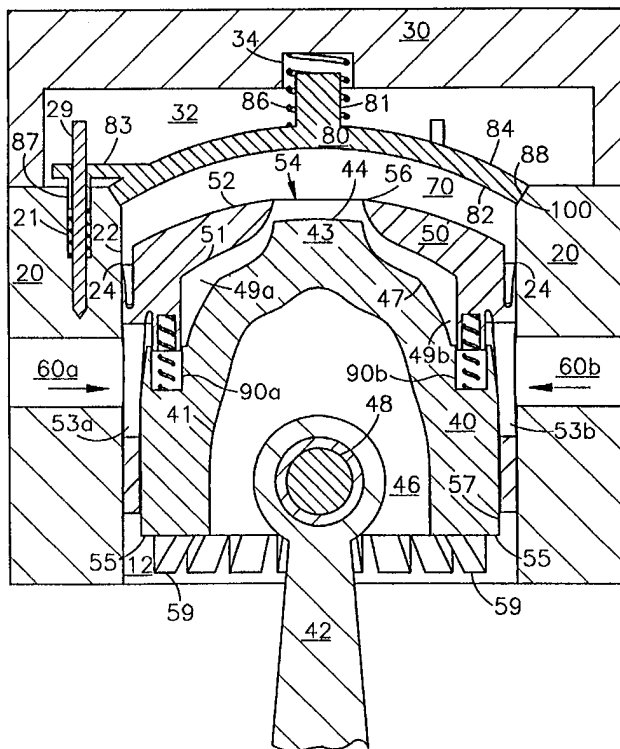


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(54) Title: GAS COMPRESSOR**(57) Abstract**

A highly manufacturable gas compressor includes a sheath (50) removably attached to a piston (40) by several resilient fingers (59) that snap into place at the bottom of the piston (40). The fingers (59) act to limit relative motion between the piston (40) and sheath (50) as the piston (40) is reciprocated within a cylinder bore (12). During the suction stroke of the compressor, the piston (40) and sheath (50) separate at their tops, creating an opening at the top of the sheath (50) which allows low pressure gas to flow through an opening (53a, 53b) formed in the side of the sheath (50), between the sheath (50) and piston (40), through the opening (54) at the top of the sheath (50), and into a compression chamber (70) formed between the top surfaces of the piston (40) and sheath (50) and the bottom surface of a discharge valve (80). During the compression stroke, the tops of the piston (40) and sheath (50) combine to form a contiguous surface that compresses the low pressure gas in the compression chamber (70) against the bottom surface of the discharge valve (80), forcing the discharge valve (80) open to release pressurized gas into a discharge chamber (32). The valving sheath (50) includes a lip seal (24) to prevent pressurized gas from escaping the compression chamber (70) between the sheath (50) and cylinder bore wall (22). Slugging protection means (21, 90a, 90b) are provided by the discharge valve (80) and the sheath (50). To eliminate noise and increase efficiency, the sheath (50) and discharge valve (80) are formed from a thermoplastic material.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/11646

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : F04B 39/10, 53/12; F16K 21/10

US CL : 417/545, 552; 137/514

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 417/545, 552; 137/514

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 1,583,535 A (DUBROVIN) 04 MAY 1926, SEE ENTIRE DOCUMENT.	25, 26, 33, 34, 37
X	US 2,970,608 A (DOEG) 07 FEB 1961, SEE ENTIRE DOCUMENT.	25, 26
X -- Y	US 5,203,857 A (TERWILLIGER ET AL.) 20 APRIL 1993, SEE ENTIRE DOCUMENT.	25,28,33, 34,35 ----- 26, 36, 37
Y	US 3,811,470 A (SCHAEFER) 21 MAY 1974, SEE ENTIRE DOCUMENT.	26, 36, 37
A	US 3,915,597 (GRANT ET AL.) 28 OCT 1975, SEE ENTIRE DOCUMENT.	1, 38

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