

Title (en)

APPARATUS FOR TRANSFERRING SMALL AMOUNT OF FLUID APPARATUS FOR TRANSFERRING SMALL AMOUNT OF FLUID

Publication

EP 0292994 A3 19891025 (EN)

Application

EP 88108514 A 19880527

Priority

JP 13140687 A 19870529

Abstract (en)

[origin: EP0292994A2] An apparatus for transferring a small amount of fluid has at least one series of vibration pump units each having a fluid transfer pipe (1a-1d) designed to perform a respirating action by the operation of a vibrator (2a-2d) which vibrates in response to application of a high-frequency voltage. The fluid transfer pipes (1a-1d) are connected in series via fluid diodes (5a-5c) which serve to enable the fluid to flow only in one direction, while resisting reversing of the fluid, so that the fluid is transferred in one direction through the successive fluid transfer pipes. In order to minimize the pulsation of the fluid pressure at the downstream end of the apparatus, the vibrators of the pump unit are excited with predetermined phase differentials. Additional fluid diode (5d) is connected to the outlet end of the most downstream pump unit. The pressure differential across at least one of the fluid diodes (5a-5d) is measured and the rate of transfer of the fluid performed by the fluid transfer apparatus is controlled in accordance with the measured pressure differential. In a specific form of the invention, a plurality of rows 29 to 29n of the vibration pump units are disposed in parallel, and the pressure differentials are measured across orifices provided on the downstream ends of the respective rows of the pump unit serieses deviations of the measured pressure differentials are detected. A control is performed in accordance with the measured pressure differential deviations so as to equalize the flow rates of the fluid in all the parallel rows of vibration pump units.

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CPC (source: EP)

F04B 43/095 (2013.01)

Citation (search report)

- [A] US 4519751 A 19850528 - BECKMAN JOHN B [US], et al
- [A] US 3107630 A 19631022 - JOHNSON ROBERT R, et al
- [A] FR 2343140 A1 19770930 - PHILIPS NV [NL]
- [A] US 3657930 A 19720425 - JACOBSON OSCAR D
- [A] US 3289594 A 19661206 - ERNST THIELE

Cited by

EP0379718A3; GB2483348A

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