US005304147A

United States Patent [19]

Johnson et al.

[11] Patent Number: 5,304,147

[45] Date of Patent: Apr. 19, 1994

[54] INJECTION SYRINGE

[75] Inventors: **Thomas R. Johnson**, Milford; **Andrew L. Cote, Sr.**, Peterborough, both of N.H.

[73] Assignee: **Johnson Medical Development Corp.**, Milford, N.H.

[21] Appl. No.: **972,612**

[22] Filed: **Nov. 6, 1992**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 750,416, Aug. 27, 1991, abandoned.

[51] **Int. Cl.**[5] **A61M 5/178**; A61M 5/315

[52] **U.S. Cl.** **604/183**; 604/223; 604/228; 604/236; 604/247; 222/383

[58] **Field of Search** 604/48, 51, 60-64, 604/70, 71, 121, 183, 186, 222, 223, 227, 228, 233, 236, 237, 247, 218; 222/324, 383, 509

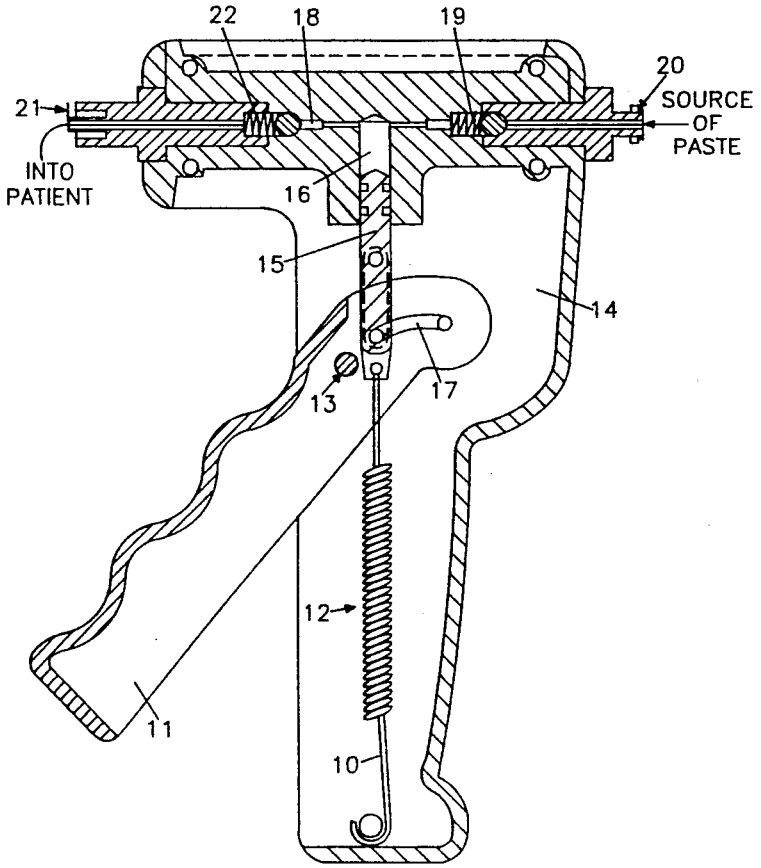
[56] **References Cited**

U.S. PATENT DOCUMENTS

1,982,993	6/1934	Kauzal	128/223
1,995,971	3/1935	Dowling	604/183
2,709,025	3/1953	Scott	222/341
3,384,081	5/1968	Castiglione	604/183
3,949,073	4/1976	Daniels et al.	128/DIG. 8
4,020,838	5/1977	Phillips et al.	604/186
4,204,539	5/1980	Van Brugge	604/183
4,342,310	8/1982	Lindmayer et al.	604/70
4,639,019	1/1987	Mittleman	604/283
4,664,298	5/1987	Shew	222/287
4,718,894	1/1988	Lazorthes	604/93
4,837,285	1/1989	Berg et al.	128/DIG. 8
4,838,866	1/1989	Marshall, Sr.	604/236

Primary Examiner—C. Fred Rosenbaum
Assistant Examiner—Mark Bockelman
Attorney, Agent, or Firm—Hayes, Soloway, Hennessey, Grossman & Hage

[57] **ABSTRACT**

An injection syringe useful in the medical arts for injecting high viscosity fluids or pastes, particularly in endoscopic applications. The syringe includes a force multiplying mechanism to infuse viscous medicaments such as collagen or polytetrafluoroethylene paste, with a controlled metering action. The force multiplying mechanism is provided by the combination of lower piston cylinder chamber that intersects with an upper cylinder chamber, wherein the piston is connected to a piston advancing means on a lever pivot arm.

45 Claims, 2 Drawing Sheets