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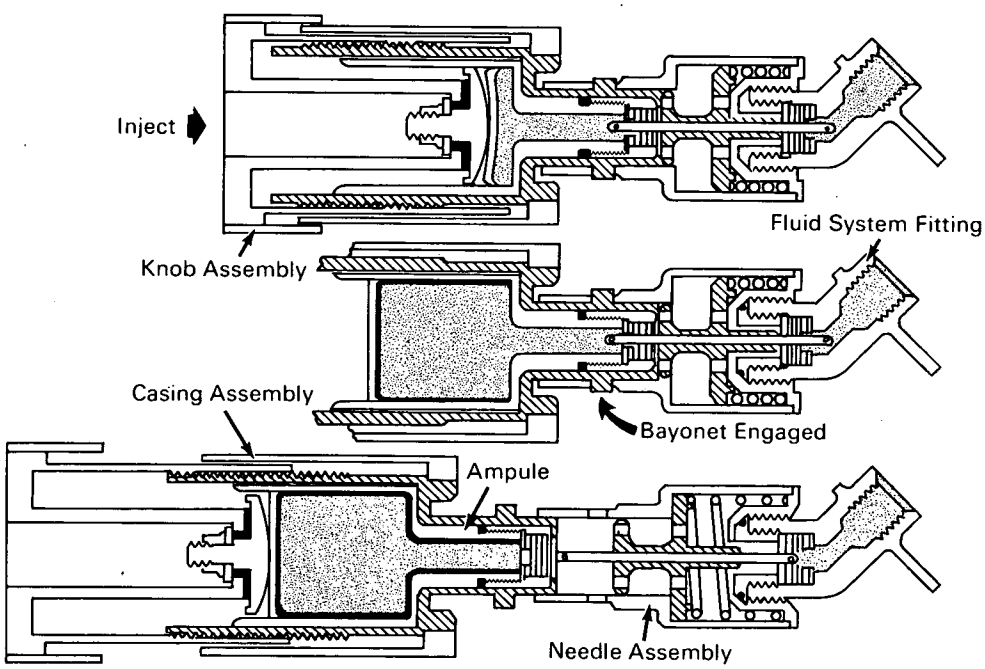
NASA TECH BRIEF

Fluid Injection Device for High-Pressure Systems



Injector Assembly

A screw-activated compressor device is proposed for the injection of measured amounts of fluids into a pressurized system. The device consists of a compressor, shielded replaceable ampules, a multiple-element rubber gland, and a specially constructed fluid line fitting.

The outer shell of the ampule consists of a rigid plastic bottle with a threaded cap. A thin-walled inner bag, made of sprayed-on layers of plastic for low permeability, empties by movement of a rigid base bonded to the bottom of the bag. Force applied at the center of the base by a spherical-ended piston expands the diameter of the base and causes its sharp edge to wipe the shell's inner diameter. As the ampule is emptied, the thin bag is prevented from extruding past the base by the applied force. The rubber gland in the cap contains three-knife-slotted, silicone-rubber washers to allow a needle to penetrate the ampule and to provide a seal when the needle is removed.

A special fitting on the fluid system provides an access port and gives threaded support for the injector while the injection takes place. The fitting has a gland similar to that of the ampule except that it has four silicone-rubber washers with knife slots. Two washers

(continued overleaf)

form a gland while the other two constitute a redundant gland.

The injector needle assembly is essentially an adapter which connects to the panel fitting and provides bayonet slots to engage the injector casing. A blunt needle from this assembly penetrates one-half of the water-panel fitting gland depth when screwed onto the panel fitting. The gland prevents flow from the water system through the needle prior to insertion of the injector assembly. As the bayonet connection is made, the other end of the needle penetrates the ampule gland completely and the needle assembly is forced against a compression spring by the injector. This causes the assembly to pass through the panel fitting gland and establish a flow path from the ampule to the water system.

This innovation provides a sturdy, easily manipulated fluid injection device which may be of interest to the chemical and food-processing industries, and particularly to the dairy industry.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Manned Spacecraft Center, Code BM7
Houston, Texas 77058
Reference: B70-10307

Patent status:

No patent action is contemplated by NASA.

Source: J. B. Ward and E. J. Copeland of
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