inflow through passage **12**) will be sufficient to force any material fed through inlet passage **12** up and out drain passage **14**. In this manner, the size of the sample fed to the sample cavity **11** is limited by the size of the inlet passage **12**. When the supply means **50** is operated, sufficient air, steam, and/or wash medium can be fed through the inlet passage **12** in order to force any sample or other contaminant through the drain passage **14** to the means for collecting **52**. Otherwise, the design of the feed/inoculation arrangement shown in FIG. **18** is similar to the sample assembly previously discussed.

The instant apparatus A has several advantages. Its geometry will enable the body **10** and its contents to be relatively small such that it can be retrofitted into existing vessels or conduits. For example, the 25 mm standard size for ferrules **1** can be accommodated with the instant invention.

The instant invention provides a uniquely designed biocompatible, resterilizable flexible diaphragm which allows the sample extraction orifice to be flush mounted with or penetrated into the vessel or conduit **53**. A customized subassembly design is possible in which all of the contamination-prone opposing sliding/rotating surfaces are sealed from the sample. For example, the bellows **30** separates and isolates a sample from the operating portions of the valve **49**. Other control features such as the steam feed valve block **5**, pure dry air valve block **6** and wash medium valve block **7** are removed from the sample. Since contamination-prone parts are removed from the process, the instant apparatus A is a more effective overall sanitary design.

The instant apparatus A is free-draining and will avoid pooling. Pockets between the sample cavity **11** and the drain passage **14** are not present such that pooling or accumulation of a sample or drain is further avoided.

All secondary seals are static to provide the most effective barrier to leakage within the system and/or to the outside environment. Further, the interfaces between the abutting surfaces on the process side (where crevice-related carryover contamination often occurs) are sealed with the static seals (with the exception of the specially designed primary seal which is a diaphragm-type seal).

The instant invention avoids the need for dynamic o-ring seals. Void volume in the sample cavity **11** is minimized. Tortuous flow is also avoided. Therefore, minimal loss of sample material during the sampling process and maximized reproducibility and accuracy of measured samples is had with the instant invention. By using small volumes, only small errors in measurements will be made.

Within this 25 mm outside diameter design discussed, the instant design permits up to six mm outside diameter particles to pass from the vessel or conduit **53** through the sample cavity **11** and out of the drain line **14** to the sample collector **94**. Therefore, physical distortion of the sample constituents is avoided, thereby assuring that samples taken are not biased due to size exclusion.

All static threaded connections and abutting surfaces of the instant invention are placed behind static o-ring seals. This removes trouble-prone interfaces from contacts with process flow.

The control means **4** and means for detecting **4***a* of the instant invention provide for automatic sampling or inoculation. Therefore, operator error is avoided. Manual override also permits sampling even in the case of power failure.

Pressure or temperature profiling of the system and independent indirect verification enables a more reliable operation.

Accordingly, with the instant invention, an accurate subsample of the process composition can be had. This arrangement can be used with existing systems or with new systems. Maintenance of the instant apparatus can easily be carried out

Because the body **10** of the instant invention can be machined from a single piece of metal, plastic or other material, if so desired, the need for additional junctures is eliminated. This also avoids potential points for contamination to the sample. Also, the bulb design of the sealing tip **32** avoids dead space.

Due to the control means **4**, the timing sequence can easily be changed. For example, an operator can change the length of each of the phases in the sampling process and, using feedback from the temperature and/or sensor probe **19**, determine if any error has occurred in the system.

The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

We claim:

1. An apparatus for moving a sample of a flowable material through a port in a wall of a vessel or conduit comprising:

a body having an end wall and an internal cavity communicable with an orifice formed in said end wall, said body having a generally centrally disposed longitudinal axis extending therethrough;

a bellows positioned within said internal cavity, said bellows having a tubular body and a sealing tip cooperable with said orifice for opening and closing said orifice, said tubular body being spaced from interior surfaces of said internal cavity to define a sample cavity between said tubular body and said interior surfaces, said sample cavity being communicable with said orifice;

a valve operating rod extending within said body for reciprocating the sealing tip of the bellows to thereby open and close the orifice;

a drain passage formed within said body, said drain passage communicating at one end with said sample cavity and extending away from said orifice, the drain passage having a longitudinal axis which is nonparallel, nonperpendicular and offset from the longitudinal axis of the body; and

an inlet passage formed within said body, said inlet passage communicating at one end with said sample cavity and extending away from said orifice, the inlet passage having a longitudinal axis, a plane passing through the longitudinal axis of the drain passage and the longitudinal axis of the body being nonparallel, nonperpendicular and offset from the longitudinal axis of the inlet passage.

2. The apparatus as recited in claim **1**, wherein the body has a generally flat internal wall at the sample cavity and the apparatus further comprises means for preventing accumulation of the sample within the sample cavity, said means for preventing comprising openings of the drain passage and the inlet passage to the sample cavity being positioned for free flow of the sample to avoid accumulation of the sample.