dampness or droplets of fluid which may be sprayed onto it.

The closed switch generates an electrical signal transmitted to controller **17** over wire **31**. Controller **17** may be an electro-mechanical device, including a clock and relays or preferably a completely electronic device. It is the function of the controller to regulate sampling intervals and to specify the sequence of apparatus operations. This is done by a semiconductor memory and associated logic circuits which execute the desired sequence on activation of an electronic clock or in response to manual instructions. The operation of the controller, as well as the entire apparatus will be described below.

Controller **17** is connected by wire **33** or by a pneumatic line to a reversible pressure source **13**. This pressure source **13** is an air compressor having valves, either internal to the device or external, which communicates with hose section **25** through sample chamber **15**. The valves can switch from positive to negative pressure, i.e., vacuum, on command of controller **17**, signalling over wire **33**.

Sample chamber **15** has a bottom valve, not shown, which is controlled by controller **17**, and which permits transfer of sample material from sample chamber **15** to sample container **35**. The purpose of sample chamber **15** is to receive a desired sample volume which is measured by a conductivity sensor, not shown, and transfer it to a sample container for further processing. Such further processing usually occurs at another location, with sample container **35** being replaced by another sample container.

Hose section **25** enters the top of sample chamber **15** at a tangential angle so that the fluid sample has rotational motion relative to the cone shaped interior of chamber **15**. This vortex helps carry all sample materials, particularly suspended solids, which might otherwise adhere to the container walls. Vortex action is established when the valve at the bottom of chamber **15** is opened once a desired sample volume has been detected by the previously mentioned conductivity sensor. The sensor is mounted at a wall height in sample chamber **15** corresponding to the desired sample volume.

An optional fresh water supply **37** is connected to the top of sample chamber **15** for providing a source cleaning sample chamber **15** and for flushing hose sections **25, 23** and the interposed reservoir **27**. The supply is operated by controller **37** which transmits electrical signals along line **39**. A fresh water supply **37** is not usually provided for portable samplers which are frequently transported to remote sites. It is more common to find it used in fixed installations having ready access to fresh water. It is preferable that water from supply **327** enter the sample chamber **15** tangentially so that the water has rotational motion for forming a vortex once sample chamber **15** is opened.

In operation, controller **17** is programmed with the total time for taking samples and the number of samples to be taken. Immediately preceeding each sampling, one or more intake channel purge cycles is carried out.

A typical cycle is as pressure source **13** forces vacuum or negative pressure in chamber **15** which has a closed bottom valve. Vacuum is communicated into the intake channel **11** so that fluid enters hose section **23** and then reservoir **27**. When fluid fills reservoir **27**, sensor **29** is activated signalling controller **17** to reverse pressure from pressure source **13**. Now positive air pressure fills sample chamber **15** and expels fluid from reservoir **27** and hose section **23**.

After the desired number of intake channel purge cycles has been completed, an optional fresh water backwash cycle may be carried out if fresh water supply **37** is provided. Controller **17** opens a valve in the normally closed supply allowing fresh water under pressure to fill chamber **15** and overflow through intake channel **11** until water emerges through orifice **19**. At that time the fresh water supply **37** is shut off and sample chamber **15** is then drained by dumping fresh water into a drain. Sample container **35** is moved out its receiving position for a sample in order that sample chamber **15** have access to a drain.

With reference to FIG. **2**, an alternate intake preconditioner system is shown. The principal difference with respect to FIG. **1** is that the pressure source **113** is a fluid pump inserted between hose sections **123** and **125**. Another difference is that a fluid reservoir has been omitted.

A fluid sensor **129** is positioned inside of hose section **123** near pressure source **113**. When pressure source **113** pumps fluid from intake orifice **119** to the level of sensor **129**, a signal is transmitted to controller **117** which reverses the pumping direction of pressure source **113**. This cycle may be repeated a desired number of times.

Upon completion of the intake channel pre-conditioning cycles, as described above, pumping action is used to fill sample chamber **115** to the desired sample volume.

The apparatus shown in FIGS. **1** and **2** is usually enclosed in a weather tight enclosure as shown in U.S. Pat. No. 3,866,028, since samplers are frequently left out-of-doors. The apparatus in its portable form is powered by a battery pack, although regular a.c. may also be used and converted to d.c. for d.c. operation of sampler electrical systems.

We claim:

1. In a fluid sampler, an intake channel preconditioner system, comprising,

an intake channel having a first end communicating with a fluid to be sampled and having a second end communicating with a sample container,

reversible pressure means communicating with said channel for drawing said fluid up to a predetermined point in said channel and expelling fluid therefrom,

control means connected to said reversible pressure means including a fluid sensor disposed at a predetermined point in said intake channel between said reversible pressure means and the first end of said intake channel and producing a signal on fluid contact, said control means for causing said reversible pressure means to draw and expel fluid in said channel.

2. The apparatus of claim **1** wherein said reversible pressure means is a compressor.

3. The apparatus of claim **1** wherein said reversible pressure means is a pump.

4. The apparatus of claim **1** wherein said intake channel comprises a hose.

5. The apparatus of claim **1** wherein said intake channel comprises a hose connected to a fluid reservoir having an inlet and outlet, said hose connected at said outlet, said predetermined point disposed proximate to the inlet thereof.

6. The apparatus of claim **1** wherein said intake channel preconditioner system further comprises a fresh