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J. O. BOWER ET AL

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FLUID SAMPLING DEVICE

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FIG. 1

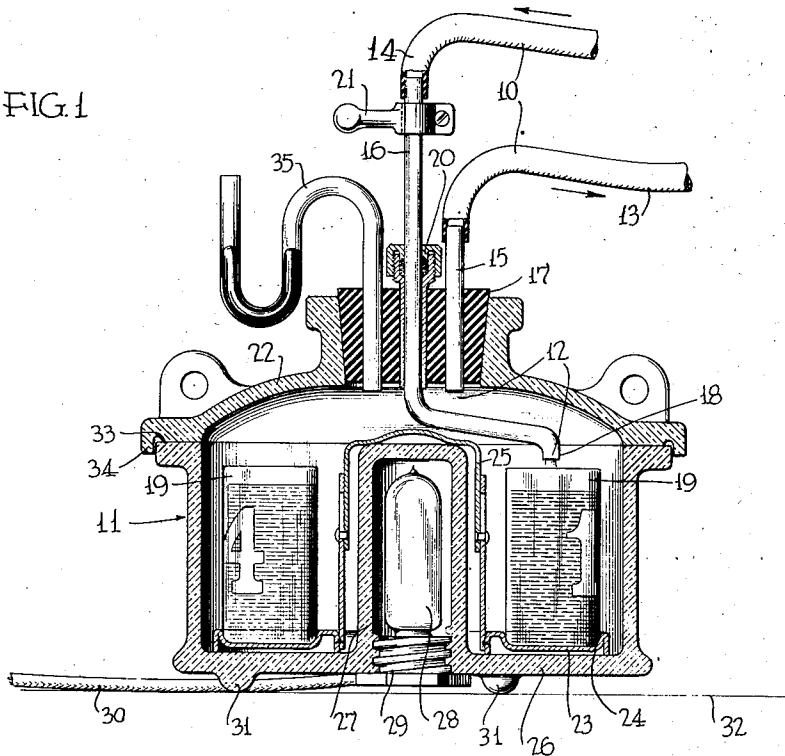
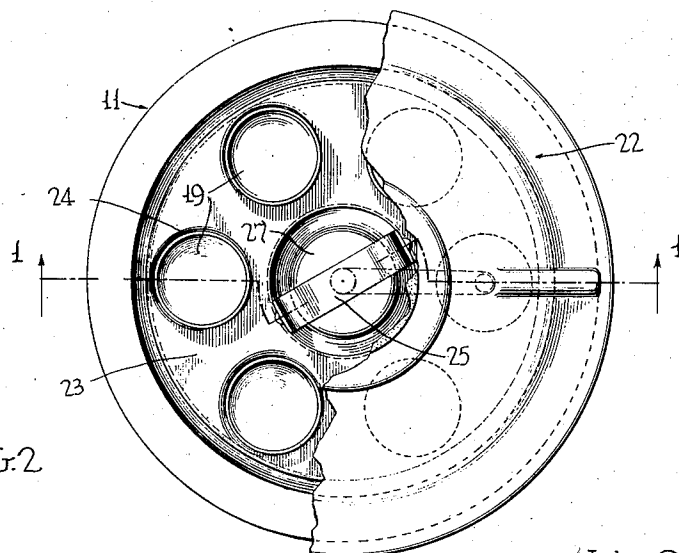


FIG. 2



INVENTORS

John O. Bower
John P. Tarbox

BY

John P. Tarbox

ATTORNEY

UNITED STATES PATENT OFFICE

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FLUID SAMPLING DEVICE

John O. Bower and John P. Tarbox, Philadelphia, Pa., assignors to Foundation for Clinical and Surgical Research, Philadelphia, Pa., a corporation of Pennsylvania

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4 Claims. (Cl. 73—21)

This invention consists of an apparatus for use in connection with systems of stomach and intestinal pumping, and a method of sampling the stomach contents or the like.

It is the common practice in the treating of stomach and intestinal disorders to have the patient swallow a vacuum pump tube, and there-through to obtain one or more samples of the contents of the organ or passage.

Where a plurality of samples are taken, the individual samples are obtained usually at stated intervals and successively examined. There has been experienced some difficulty in preserving the serial order of the samples so obtained, and in effecting thorough-going comparative examinations of the successive specimens.

In the treatment of intestinal obstructions in particular, the specimens are obtained in greater number and over longer periods. It has been found there is a great deal to be learned through orderly, timely, and appropriate comparison of the samples, and that there is possible a degree of timeliness, order, and appropriateness of examination which has not heretofore been indulged in.

One object of our invention is to provide a method and apparatus through which greater accuracy in timing, full exactness in order and maintenance of order, and every appropriate examination can be made.

Another and outstanding object of the invention is to attain a process through which comparisons of consistency and color can be simultaneously made between the ordered samples.

According to the method of the invention, we periodically take samples from the organ or passage, as the case may be, separately preserve and identify these samples, preferably in succession in the order taken, through relative ordering and identification upon a common support, and arrange them in such form that they may be commonly illumined to the same degree whereby the consistency and color comparisons can be accurately made.

The apparatus devised for this purpose comprises a vacuum conduit having a break therein adapted to be closed by a removable and replaceable vacuum chamber, together with a relatively movable support for a plurality of sampling containers adapted to support the sampling containers successively in such juxtaposition to said break as to receive and retain sample discharges from the break when discharges are passed therethrough by vacuum-maintained force, together with mechanism for relatively progres-

sively moving the said support with respect to said section of the vacuum conduit to bring about and to destroy such juxtaposition of the sampling containers successively, the support being such as to permit or effect uniform and adequate illumination of the containers simultaneously.

In the accompanying drawing is shown one embodiment of our invention, that which is best known to us.

Referring to the drawing:

Figure 1 is a vertical section of one form of the apparatus;

Figure 2 is a plan view of the same with the apparatus cover and support for the vacuum conduit partly removed to show the interior arrangement.

In these several views like parts are provided with like reference numerals.

10 is the vacuum conduit having therein a break adapted to be closed by a removable and replaceable vacuum chamber 11. This is in the form of a transparent glass bell-jar. The break in the vacuum conduit therein is designated 12. The vacuum conduit comprises two branches, the one 13 leading to a suitable pump or other source of vacuum in the direction of the arrow, and the other 14 leading or adapted to be led from the stomach or other organ of the body from which it is desired to extract samples. These conduits are in the form of rubber tubes terminated respectively in glass tubes 15 and 16 which enter the vacuum chamber 11 through a rubber stopper 17. One of these glass tubes 15 and 16, preferably the tube 16, the terminus of the branch 14, is passed axially of the stopper 17 and of the vacuum chamber 11, and then turned radially outwardly and downwardly to discharge into containers 19, arranged in an annular series about the axis of the container 11 and the tube 16.

Also, entering the chamber 11 alongside of the tubes 15 and 16, is a manometer tube 35 for the indication of the degree of vacuum employed.

The passage of tube 16 through the stopper 17 is through a ferrule 20 provided at its upper end with a stuffing box, and the tube 16 is provided with a small hand-clamp 21 by means of which it may be rotated in the ferrule 20. Furthermore, the top 22 of the vacuum chamber 11 is not only removable and replaceable to permit placement and removal of the annular series of containers 19 therein, but also rotatable on the body 11. Thus either through rotation of the tube 16 to bring its discharge end 18 into juxtaposition to one or another of the containers 19,

or through rotation of one or the other of the cover and the body 22, 11 (the one also to move the discharge end 18, and the other to relatively move the containers 19)—relative progressive movement between the support for the containers 19 (constituted by the body 11 of the chamber) and the vacuum conduit 10 and the break therein 12, is achieved to the end of bringing about and destroying juxtaposition of the sampling containers successively to the discharge end 18 and the break 12 in the vacuum conduit. Thereby the successively-taken sample discharges may be received and retained by successive containers 19 of the annular series.

The joint 33 between the cover 22 and the body 11 of the bell-jar, is generally of plain form to make an air-tight fit when the faces are ground as usual. In order, however, to insure concentricity of relative rotational movement of cover 22, the ground faces may be provided with an over-hanging flange 34 or other form of axial alignment means.

The containers 19 are in the form of glass beakers or ordinary water glasses. They are numbered in the order of succession in the series, for example, 1 to 6 (the numbers 1 and 4 appear in Fig. 1). They are carried within the chamber 11 in the form of device shown in Figs. 1 and 2 upon a unitary tray 23 provided with equi-angularly spaced depressions 24 to receive the bottoms of the containers 19 and retain them in position, with their axes approximately vertically below the arc of travel of the discharge end 18 of the vacuum conduit, and a short distance therefrom. A looped bail 25 having an extensible top is provided for lifting the tray 23 into and out of the chamber 11 and otherwise manipulating the series of samples as a group.

The bottom 26 of the chamber 11 about the axis of the chamber, is made reentrant at 27, and within these reentrant walls there is axially disposed an electric lamp 28 which provides a central source of illumination for all of the samples while yet within the clear-glass chamber 11. This lamp is introduced by screw-threading or otherwise securing an appropriate lamp socket base 29 within the reentrant walls. Through removal of the base the standard lamp bulb may be removed and replaced or renewed. The lamp cord 30 leads to the base beneath the chamber 11, which latter is provided with feet 31 spacing it from the table or other foundation 32 upon which it may be rested, to permit access of the cord 30 to the lamp. By reason of the axial symmetry of the lamp, and the annular series of containers 19, there is provided through the transparent glass walls of the containers and the chamber 11, perfect uniformity of illumi-

nation of all of the samples which may be taken.

The apparatus of Figs. 1 and 2 has the advantage of completeness and continuous sealed coverage of the samples during the period of their taking and examination.

While there has been described but one embodiment of the invention, obviously the invention is susceptible to yet other embodiments irrespective of the circumstantial terminology of the appended claims. We intend to cover all embodiments and modifications thereof in which there are to be found those elements of the generic spirit of my invention which characterize the several features thereof.

What we claim is:

1. Apparatus of the type described comprising a vacuum chamber formed of separable body and cap members, outlet and inlet conduits penetrating and supported by said cap member, said inlet conduit being centrally and rotatably positioned in said cap member and having a radially extending nozzle section adapted to supply fluid to plural containers concentrically arranged in said body member.
2. Apparatus of the type described comprising a transparent vacuum chamber formed of separable body and cap members, outlet and inlet conduits penetrating and supported by said cap member, said inlet conduit being centrally and rotatably positioned in said cap member and having a radially extending nozzle section adapted to supply fluid to plural containers concentrically arranged in said body member, and said body member having a re-entrant base projection wherein a lamp may be removably inserted.
3. Apparatus of the type described comprising a vacuum chamber formed of separable body and cap members, outlet and inlet conduits penetrating and supported by said cap member, said inlet conduit being centrally and rotatably positioned in said cap member and having a radially extending nozzle section adapted to supply fluid to plural containers concentrically arranged in said body member, and means for holding said containers in predetermined position within said chamber body member.
4. In a vacuum chamber having cap and body members, the cap member having inlet and outlet conduits and the body member a base with a re-entrant central projection, a support for plural containers comprising an annular plate with container receiving recesses sequentially formed therein and a central bail attached to overlie said body base projection, said bail being extensible to a point above said body section.

JOHN O. BOWER.
JOHN P. TARBOX.