

1

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AUTOMATIC SAMPLE COLLECTING APPARATUS
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The present invention relates to an automatic sample
 collecting method and apparatus and more particularly
 to a method and apparatus for the automatic collection of
 the components of sample in a gas chromatograph.

The present invention is directed to a sample collec-
 tion method and apparatus particularly adapted for use
 with a gas chromatograph for separately collecting the
 different components of a sample in individual collection
 bottles without contaminating the component in one
 bottle with any of the other components. While the in-
 vention is usable for collecting components in many
 different processes, the invention will be described herein
 with particular reference to a gas chromatograph.

According to the present invention to be described here-
 inafter in greater detail a plurality of collection bottles
 are provided at different positions around a circular table,
 and in response to a detector which analyzes the compo-
 nents of a sample passing through the column or fluid
 discharge tube of a chromatograph the table is alter-
 nately rotated and raised and lowered to place the end
 of the discharge tube successively into different collec-
 tion bottles to collect in separate collection bottles the
 components passing out of the discharge tube at time
 spaced intervals. This method and apparatus avoids
 contamination of the component in any one bottle with
 other components since the particular desired component
 passing through the discharge tube at any one time is
 passed directly into a collection bottle which is separated
 from communication with the discharge tube once the
 run of that particular component has been completed.
 Thus, the contamination of components attendant with
 the distribution of all the components in the common
 manifold of the prior art is eliminated. Also, according
 to the present invention no valves which can deteriorate
 during use are required.

The present invention may be utilized to successively
 collect each of the different components of the sample in
 a separate collection bottle positioned in its turn around
 the table, or by placing the collection bottles in alternate
 slots in the rotating table heart cuts may be made by col-
 lecting just the main fraction of the components in the
 collection bottles and discarding or wasting the remainder
 of the sample through the open slots which are positioned
 in the table between successive collection bottles.

An important feature of the invention when certain
 components of the sample are collected in separate col-
 lection bottles lies in the fact that additional sample may
 be inserted into the chromatograph and the collection
 cycle repeated to yield ultra pure components in any de-
 sired size.

In a particular embodiment of the present invention,
 the means for stopping rotation of the table and for
 raising the table for insertion of the discharge tube into
 a collection bottle includes a lever arm provided with a
 roller portion on its one end. This roller portion rolls

2

on the periphery of the table so that upon rotation of the
 table this roller portion rolls into an initial portion or
 notch of one of the slots in the table, and means respon-
 sive to this position of the lever arm stops rotation of
 the table and raises the table so that the discharge tube
 is inserted either into a collection bottle for collection of
 the component passing through the discharge tube or is
 inserted through a slot in the table for wasting the ma-
 terial issuing from the discharge tube.

Additionally, the apparatus is provided with short by-
 pass clips which can be slidably inserted into certain of
 the table slots to prevent the lever roller portion from
 extending into that slot and thereby prevent the table
 from stopping at that slot. Additionally, a longer return
 clip is provided for insertion into the slot after the last
 collection bottle for initiating a new cycle.

Furthermore, according to the present invention, a novel
 sample collection bottle is provided having an upper
 chamber, a lower chamber, means providing communi-
 cation between the bottom of the upper chamber and the
 top of the lower chamber and inlet and outlet tubes for
 the bottle. The inlet tube passes from the lower chamber
 vertically through the upper chamber to provide commu-
 nication between the lower chamber and the exterior
 of the bottle for insertion of a sample to be collected
 into the bottle. The outlet tube projects out of the top
 of the upper chamber at an angle with respect to the in-
 let tube to provide communication between the top of
 the upper chamber and the exterior of the bottle for
 allowing air to escape from the bottle when the bottle is
 being filled. Additionally, on the end of the outlet tube
 is provided a vent cap which has a pressure exit opening
 that moves from a closed position to an open position
 when horizontal pressure is applied against the vent cap.
 Thus, when this novel sample collection bottle is sup-
 ported in a slot of the collection table and the table
 raised for insertion of the fluid discharge tube into the
 inlet tube, the lever arm projecting into the initial por-
 tion of the slot applies pressure against the vent cap to
 open the pressure exit opening in order to avoid pressure
 build-up in the collection bottle.

Also, the fluid discharge tube is provided with a tubular
 needle insert at its output end for piercing a cover cap
 on the top of the collection bottle. This construction per-
 mits the collection bottles to remain sealed against con-
 tamination from atmospheric air and still avoid pressure
 surges during piercing of the bottle cover by the discharge
 tube needle insert.

Other objects and features and advantages of the pres-
 ent invention will become apparent upon reading the fol-
 lowing specification and referring to the accompanying
 drawings in which similar characters of reference repre-
 sent corresponding parts in each of the several views.

In the drawing:

FIG. 1 is a plan view illustrating apparatus according
 to the present invention;

FIG. 2 is a side sectional view of a portion of the struc-
 ture shown in FIG. 1 taken along line 2—2 and showing
 the collection bottle table in lowered position;

FIG. 3 is a view similar to FIG. 2 showing the col-
 lection bottle table in elevated position;

FIG. 4 is a view of a portion of the structure shown
 in FIG. 3 taken along line 4—4;

FIG. 5 is an enlarged elevational view, partially in sec-