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|---|-----------|---------|-------------------|----------|
| [54] SELF-LOCATING SAMPLE RECEPTACLE
HAVING INTEGRAL IDENTIFICATION
LABEL | 3,027,799 | 4/1962 | Weichselbaum..... | 356/246 |
| | 3,551,062 | 12/1970 | Brown..... | 356/244 |
| | 3,589,867 | 6/1971 | Heinz et al..... | 73/423 A |

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[21] Appl. No.: 250,187

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Related U.S. Application Data

- [60] Division of Ser. No. 72,143, Sept. 14, 1970, Pat. No. 3,680,976, which is a continuation-in-part of Ser. No. 830,059, June 3, 1969, abandoned.

- [52] **U.S. Cl.**..... 356/244, 233/26
[51] **Int. Cl.** G01n 21/16, B04b 9/12
[58] **Field of Search** 356/244, 246; 73/53,
73/423 A; 233/26

[56] **References Cited**

UNITED STATES PATENTS

- | | | | |
|-----------|--------|---------------------|----------|
| 3,526,125 | 9/1970 | Gilford et al. | 73/423 A |
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[57] **ABSTRACT**

A liquid sample receptacle includes an integral label portion carrying machine-readable indicia identifying the sample source and located substantially parallel to the longitudinal axis of a cup portion. The sample receptacle is structured with respect to the turntable unit to properly align the machine-readable indicia for automatic readout.

13 Claims, 9 Drawing Figures

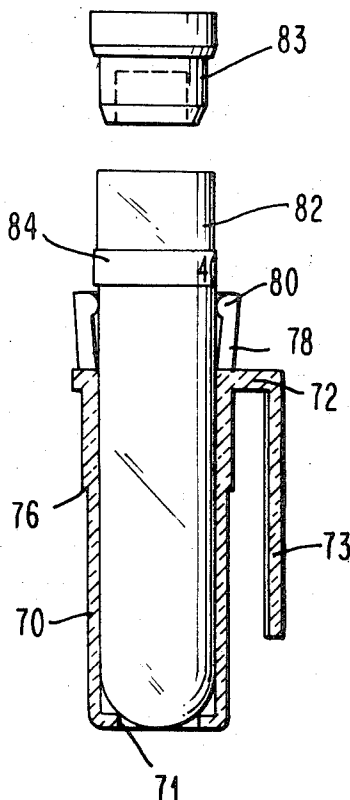


FIG. 1A

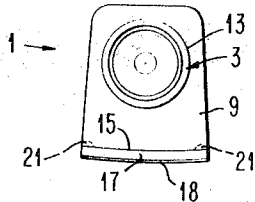


FIG. 1B

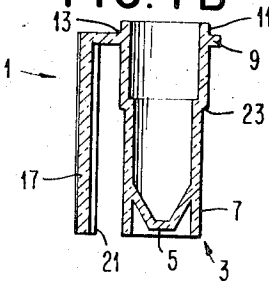


FIG. 1C

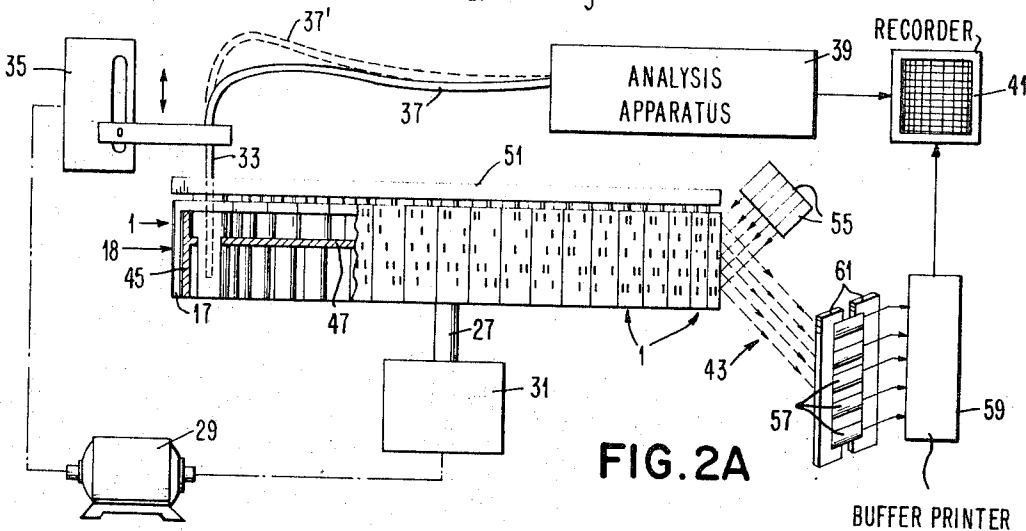
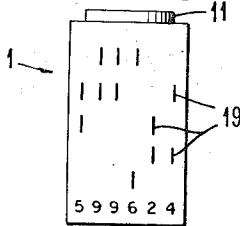


FIG. 2A

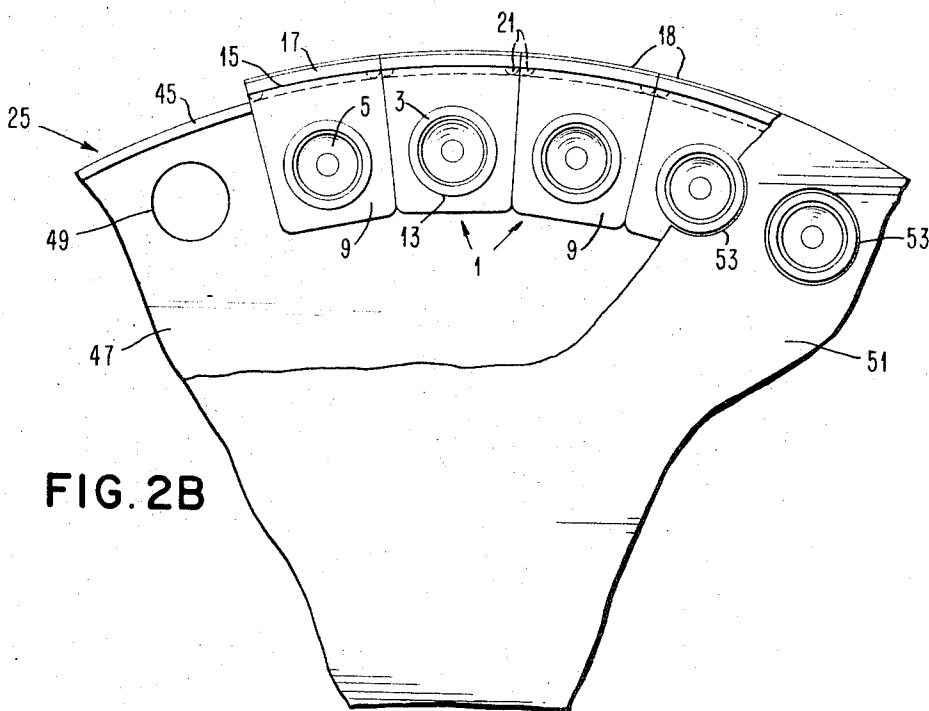


FIG. 2B

FIG. 3A

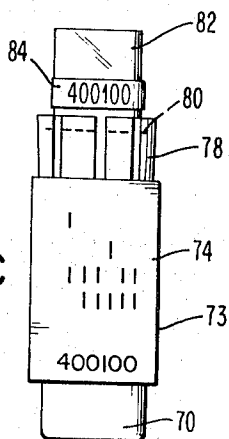
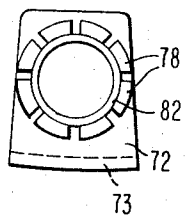


FIG. 3C

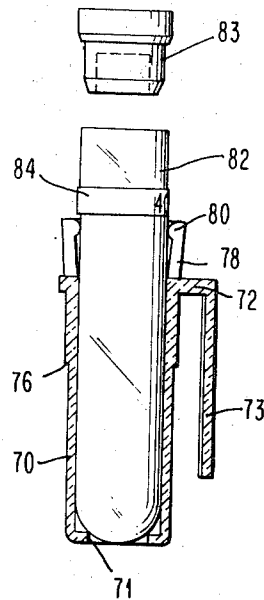
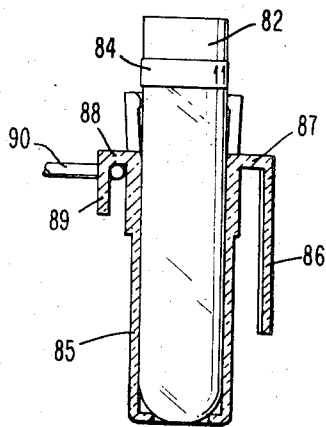


FIG. 3B

FIG. 4



SELF-LOCATING SAMPLE RECEPTACLE HAVING INTEGRAL IDENTIFICATION LABEL

This application is a division of application Ser. No. 72,743 filed Sept. 14, 1970, now U.S. Pat. No. 3,680,976 issued Aug. 1, 1972 which in turn was a continuation-in-part of Ser. No. 830,059 filed June 3, 1969, and now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention.

The invention relates to automatic apparatus for the quantitative analysis of liquid samples and, more particularly to a liquid sample receptacle for introducing liquids to be analyzed to said apparatus, such receptacle having an integral portion bearing machine-readable coded indicia identifying the sample source.

2. Background of the Invention.

In the prior art, numerous apparatuses have been described for the automatic quantitative analysis of liquid samples, for example, in the Skeggs U.S. Pat. No. 2,797,149, issued on June 25, 1957, and the Skeggs et al. U.S. Pat. No. 3,241,432, issued on Mar. 22, 1966. In such apparatuses, different liquid samples to be analyzed for one or more constituents of interest are located in individual sample receptacles which are positioned on a turntable unit. The turntable unit is indexed to allow the liquid samples to be aspirated successively and directed to analysis apparatus as a continuous stream, generally segmented by an immiscible, inert fluid, either liquid or gas. The samples are treated individually with particular reagents and, subsequently, directed to an analysis apparatus wherein the concentration of a particular constituent of interest is determined, for example, colorimetrically, spectrochemically, etc.

In such apparatuses, the individual liquid samples being analyzed are essentially visually indistinguishable and, hence, a sample-source relationship is non-existent. It is essential, however, that proper identity of the individual liquid samples be correlated with respect to the sample source such as a patient. Without such correlation, automatic and continuous analysis of liquid samples cannot be practical, and the analyst would be forced to revert to slower and, often, less reliable manual processes, wherein the sample-source relationship is maintained. Generally, to effect such correlation, each sample receptacle is identified by a sample identification card, attached either to the sample receptacle, per se, or to the sample receptacle holder on the turntable unit. Each identification card carries machine-readable coded indicia identifying the sample source, and is readout, in turn, by automatic means as the turntable unit is indexed, the readout information being correlated with the analysis results.

However, the attachment or positioning of sample identification cards was manually performed. Great care was required of the analyst to insure that each was accurately positioned and properly aligned with respect to the automatic readout means. Misalignment, or misregistration, of an identification card would result in improper identification of the corresponding liquid sample. In the prior art to date, there has been much effort directed to the problem of sample identification, both with respect to insuring a completely reliable system and, also, reducing the manual effort involved.

OBJECTS OF THE INVENTION

Accordingly, an object of this invention is to provide positive sample identification in automatic analysis apparatuses.

Another object of this invention is to provide, in automatic analysis apparatuses, for the positive alignment of machine-readable coded information identifying a sample source concurrently with the positioning of a sample container on a turntable unit.

Another object of this invention is to provide a liquid sample receptacle including an integral label portion supporting machine-readable indicia identifying the sample source.

A further object of this invention is to provide a liquid sample receptacle including an integral label portion supporting machine-readable indicia and which is self-aligning with respect to automatic readout means.

A still further object of this invention is to provide a liquid sample receptacle of particular structure which is self-aligning and self-retaining when positioned on an indexable turntable unit.

Still another object is to provide a liquid sample receptacle including a holder having an integral label portion carrying identifying indicia, which holder removably receives for support thereby a cuvette containing the liquid sample.

SUMMARY OF THE INVENTION

In accordance with the preferred embodiment of the present invention, the sample receptacle comprises an elongated tubular cup portion, either of cylindrical, oblong, or rectangular cross-section, and a curved label portion, the respective longitudinal axes being substantially parallel. The label portion is integral with the cup portion along a planar connector portion shaped as an annular section. The connector portion collars the cup portion, and is joined along its longer curved edge to the label portion. The connector portion and, also, the label portion are dimensioned such that the respective edges thereof abut corresponding edges of sample receptacles when properly positioned on an indexable turntable unit. Accordingly, the surfaces of the respective label portions which support machine-readable coded indicia, define a cylindrical shape, each unit surface being spaced a proper distance, when indexed, from stationary readout means, positioned adjacent to the turntable unit. Also, abutment of the corresponding edges insures proper axial alignment of the coded indicia with respect to the readout means.

Further, the turntable unit is structured so as to be engaged between the cup and label portions of each sample receptacle. The turntable arrangement includes an annular rim portion and, also, an aperture for receiving the cup portion of a positioned sample receptacle. The cup and label portions of each sample receptacle are spaced so as to clasp the rim portion of the turntable arrangement to provide alignment and stability. Also, when a sample receptacle is properly positioned, its connector portion rests on the upper edge of the rim portion to insure proper vertical alignment of the coded indicia with respect to the readout means.

FIG. DESCRIPTION OF THE DRAWINGS

FIGS. 1A, 1B, and 1C show a top view, full sectional view and a front view, respectively, of a liquid sample receptacle according to the present invention.

FIG. 2A shows a partial-sectioned side view of a turntable unit supporting a plurality of liquid sample receptacles as would be employed in an automatic analysis apparatus, which apparatus is illustrated in block form.

FIG. 2B is a partial top view of the turntable unit of FIG. 2A.

FIG. 3A is a view similar to FIG. 1A illustrating a modification of the sample receptacle.

FIG. 3B is a partially exploded view similar to FIG. 1B further illustrating the modification.

FIG. 3C is a view similar to FIG. 1C further illustrating the modification.

FIG. 4 is a view similar to FIG. 3B illustrating still another modification of the sample receptacle.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIGS. 1A - 1C, the sample receptacle 1 includes an elongated cylindrical cup portion 3, formed of plastic or other suitable inert material, having an inverted conical bottom 5 raised slightly above lower extremity 7. Conical bottom 5 insures that substantially the entire liquid sample contained in cup portion 3 can be aspirated, as hereinafter described.

A connector portion 9 is attached to and collars cup portion 3 slightly below its upper extremity 11. Connector portion 9 can be formed of a flat sheet of any appropriate rigid material, e.g., a plastic, and includes an aperture 13 for receiving cup portion 3. As shown in FIGS. 1A and 1B, connector portion 9 is preferably shaped as an annular section, cup portion 3 being received in the narrower end portion. Also, connector portion 9 is joined along its entire wider curved edge 15 to label portion 17, the latter being supported substantially parallel with respect to the longitudinal axis of cup portion 3. Label portion 17 can be formed of a same material as connector portion 9, whereby sample receptacle 1 could be formed as a unitary structure, for example, by moulding. As shown, label portion 17 extends downwardly and terminates in the plane of the lower extremity 7 of cup portion 3. Accordingly, when the sample cup 1 is positioned on a flat surface, its stability is greatly increased.

Label portion 17 is slightly curved, as shown in FIG. 1A, for reasons hereinafter explained, the outer surface supporting coded indicia identifying the source individual from whom a contained sample was taken. A two-out-of-five binary code with parity check is shown, the binary quantities being arranged in parallel by bit-serial by character fashion and indicated by the presence or absence, respectively, of a binary notation, herein represented as a color discontinuity suitable for optical readout. For example, the coded indicia can be printed on a paper label 18 which is affixed to the outer surface of label portion 17. Alternatively, the binary quantities could be indicated by the presence or absence of a surface discontinuity, for example, a recess bump or hole, so as to be suitable for mechanical readout. To assist the technician, the decimal equivalent of the binary notations can be provided on label portion.

Also, label portion 17 includes on its inner surface a pair of longitudinal ribs 21. Additionally, cup portion 3 includes an annular shoulder 23 along an intermediate portion.

Ribs 21 and shoulder 23, as hereinafter described, insure alignment of the coded indicia during readout. It will be obvious that ribs 21 and shoulder 23 can be used individually to insure such alignment.

As shown in FIGS. 2A and 2B, a plurality of sample receptacles are positioned on a turntable unit 25. Turntable unit 25 is mounted on drive shaft 27, which is coupled to a drive motor 29 through a Geneva-type gearing arrangement 31. Gearing arrangement 31 intermittently indexes turntable unit 25 to successively position each sample receptacle 1 with respect to sample probe 33. Also, motor 29 is coupled to a drive arrangement 35 which functions to move probe 33 (FIG. 2A) into and out of cup portion 3, as indicated in phantom and by the arrows. The movement of probe 33 is synchronized with the rotation of turntable unit 25, such that the probe is withdrawn while the turntable unit is indexed and immersed in a juxtaposed sample receptacle during the dwell time of the turntable unit. Mechanisms of this type are known in the art and have been described, for example, in the Isreeli U.S. Pat. No. 3,038,340, issued on June 12, 1962, and the de Jong U.S. Pat. No. 3,134,263, issued on May 26, 1964.

Probe 33 is connected along a sample tube 37 to the automatic apparatus 39 for performing a number of analyses of each liquid sample. For example, such apparatus has been shown and described in U.S. Pat. No. 3,241,432, supra, probe 33 and sample tube 37 corresponding to take-off device 18 and conduit 12 shown in such patent. Apparatus 39 includes a peristaltic pump, not shown, which is connected along sample tube 37 to probe 33 whereby liquid sample is aspirated from a sample receptacle 1 while probe 33 is immersed within the sample contained in cup portion 3; air is aspirated while probe 33 is withdrawn from cup portion 3 and turntable unit 25 is being indexed. Accordingly, a continuous flow of liquid samples, each sample separated, or being segmented, by an air bubble is directed along sample tube 37 to the apparatus 39. As fully described in the U.S. Pat. No. 3,241,432, supra, each liquid sample, in turn, is individually reacted and treated and, subsequently, analyzed to ascertain the quantity of particular constituents of interest under test. The results of such analysis are directed to recorder 41, wherein a permanent record of the analysis results is provided. However, these analysis results must be correlated with the identity of the sample source, otherwise they are meaningless or misleading.

Positive correlation of the analysis results recorded by recorder 41 is achieved in accordance with this invention by insuring positive alignment of the identifying coded indicia on each sample receptacle 1 with respect to the readout means 43. Positive alignment is insured by the related structural features of sample receptacle 1 and turntable 25, as particularly shown in FIGS. 2A and 2B. As shown, turntable unit 25 includes an annular rim portion 45 integral with disc portion 47, which is attached to driveshaft 27. A circular row of holes 49, each dimensioned to receive a cup portion 3, is defined in disc portion 47. The spacings between adjacent holes 49 are such that, when sample receptacles 1 are positioned on adjacent holes, the edges of the respective connector portions 9 and label portions 17 are abutting. Also, rim portion 45 is dimensioned to be received and clasped between the cup portion 3 and label portion 17 of a sample receptacle 1. To this end, label portion 17 is slightly inclined inwardly, say 1° or more, to insure a slight pressure being applied between the outer surface of rim 45 and the adjacent wall surface of hole 49, whereby a sample receptacle 1 is retained in fixed position on turntable unit 25. Alternatively, the

cross-section of rim portion 45 can be truncated whereby the lower dimension is slightly greater than the spacing between ribs 21 and the outer surface of the lower extremity 7 of cup portion 3 to achieve a same result.

Also, as shown in FIGS. 2A and 2B, that particular structures of connector portions 9 and label portions 17, of adjacent sample receptacles 1 are dimensioned to abut along their adjacent edges. Preferably, connector portion 9 is formed in an annular section would subtend an angle θ having its origin at the center of turntable unit 25, where $\theta = 360^\circ/n$, n being the maximum number of sample receptacles 1 to be supported. Also, the centers of adjacent holes 49 and, also, each label portion 17 subtend a same angle θ . To position a sample receptacle 1 onto turntable unit 25, the analyst would introduce the receptacle downwardly onto rim portion 45 in such a fashion as to increase the spacing between label portion 17 and of cup portion 3. At this time, rib portions 21 would be rubbed along the outer surface of rim portion 45 which removes any particulates from such surface and insures a close contact therebetween. When sample receptacle 1 is positioned, rim portion 45 is firmly clasped due to the resiliency of label portion 17 and cup portion 3 to retain the sample receptacle 1 in position. Also, by applying a slight downward pressure to connector portion 9, such portion is forced to rest upon the upper edge surface of rim portion 45 and, also, shoulder 23 on the corresponding cup portion 3 is forced to rest upon disc portion 47 to vertically align the label 18 affixed to portion 17. As adjacent sample receptacles 1 are positioned on turntable 25, abutment of the edges of the respective connector portion 9 and label portions 17 insures that such vertical alignment along with an axial alignment is achieved. Finally, a cover plate 51 having a circular row of holes 53 is positioned over turntable unit 25 to insure that the alignment of the sample receptacles 1 is maintained. The upper extremity 11 of each cup portion 3 is accessible through a corresponding hole 53 in cover plate 51 to allow for the aspiration of the liquid sample.

While the connector portions 9 have been illustrated and described as formed in annular sections and, also, label portions 17 have been described as being curved, alternative structures are possible. For example, a connector portion can be formed in a rectangular geometry, raised guide portions, for example, of a substantial triangular geometry being provided on the upper edge of rim portion 45 to position the corresponding cup receptacle. Also, label portions 17 can be formed in planar fashion, the ribs 21 being provided to compensate for the curvature of rim portion 45; also, the rim portion could be polygonal, having a planar surface corresponding to each sample receptacle to be positioned on turntable unit 25.

As turntable unit 25 is indexed by gearing arrangement 31, each sample receptacle 1 is positioned, in turn, with respect to probe 33, whereby a portion of the liquid sample is aspirated and directed to apparatus 39, and subsequently advanced to pass the label portion 17 by optical readout apparatus 43. Printout of the coded indicia on label portion 17 is effected by buffer-printed 59 a finite time subsequent to sample aspiration, such time being equal to that time required for the corresponding sample to be passed through apparatus 39 and analyzed whereby the graphical analysis results and

the identification is provided concurrently to recorder 41. This time can be determined by the location of the readout means 43 with respect to probe 33 or, alternatively, by providing for a temporary information storage in buffer-printer 59.

Since an optical readout is described, readout is effected during indexing of turntable unit 25, i.e., while 33 is removed. As shown in FIG. 2A each of the columns of binary notations, each representing a particular binary word, is illuminated by an individual pencil-beam light source, generally indicated as 55. The binary bits, represented by a coded pattern of elongated dark marks 19 as shown in FIG. 1C, in each individual rows are illuminated as turntable unit 25 is indexed, the intensity of each reflected light beam being modulated according to the passage of a dark mark indicating a particular binary quantity. The reflected modulated light beam from sources 55 are detected by a bank of photocells, generally indicated as 57, one such photocell corresponding to each binary bit. A light shield 61 can be provided to shield the photocell from stray light. Readout is effected parallel by bit-serial by character, corresponding information bit slots in each binary word being vertically aligned. The respective outputs of the photocells 57 are directed to a buffer-printer unit 59, which has the capacity to store the binary information and, in turn, to print the corresponding decimal number, also shown on label portion 17, on the permanent record being made by recorder 41. Printing of the decimal number is effected concurrently with the recording of the analysis results, whereby correlation therebetween is achieved. Such techniques are well known in the art and are described, for example, in the Pelavin U.S. Pat. No. 3,419,879, issued on Dec. 31, 1968. In such patent, readout is effected mechanically by the sensing of coded notches located on the edges of a sample identification card which is physically attached to the liquid sample receptacle. Alternatively, sample receptacles 1 and, also, the output of readout means 43 can be identified in ascending numerical sequence and subsequently correlated. The particular structures of sample receptacles 1 and turntable unit 25 positively assure alignment of label portions 19 within the vertical and axial tolerances of the readout beam whereby accurate sample identification is achieved.

While the receptacle 1 shown in FIGS. 1A-2B may be a unitary structure, the modification illustrated in FIGS. 3A, 3B and 3C is not such a unitary structure. The modified form includes a cup portion 70 generally similar to the cup portion 3 previously described but having a different bottom configuration, as best shown in FIG. 3B, wherein the bottom is shown as substantially flat and having an opening 71 extending upwardly therethrough. The cup portion 70 receives a removable tube or cuvette as will be explained in detail hereinafter. If desired, the bottom of the cup portion 70 may be closed.

A connector portion 72 similar to the previously described connector portion 9 is attached to and collars the cup portion 70 below its upper extremity. Connector portion 72 is joined along its entire wider curved edge to label portion 73, similar to label portion 17. The cup portion 70 extends below the label portion 73. A label 74, as of paper, similar to label 18, is affixed to the label portion 73 in a similar manner and bears, in addition to other indicia similar to the indicia 19, an identification number indicating the source of the sam-

ple. The cup portion 70 has a circumferential shoulder 76 intermediate of its ends similar to the shoulder 23. It serves the same function.

Above the connector portion 72, the cup portion 70 is provided with a series of upwardly extending circumferentially extending fingers 78 which may be formed as an integral part thereof, the fingers 78 being spaced from one another. At their upper extremities the fingers 78 are each provided with a transverse rib 80 located on the inner surface thereof, that is, the surface facing toward the center line of the cup portion 70.

The sample receptacle receives in the cup portion 70 thereof through the upper end a tube 82 closed at the bottom to support a liquid sample, the tube being open at the top in the conditions shown in FIGS. 3A and 3C. The tube 82 is of an outer diameter approaching that of the inner diameter of the lower part of the cup portion 70 and sufficiently larger than the aperture 71 so that the tube, which may have a rounded bottom extending into the opening 71 will not pass therethrough. The diameter of the tube 82 is also slightly greater than that of the interrupted ring formed by the ribs 80 on the fingers 78, so that the distal ends of the fingers are sprung slightly laterally outwardly as the tube 82 is thrust into the cup portion 70. Hence it will be understood that the fingers 78 have a tube-retaining function once the tube 82 is assembled with the cup portion 70. The fingers 78, which as previously indicated may be formed of plastic material, are sufficiently resilient to bear against the tube 82 to hold the tube in assembled condition, even in the event that the assembly is inverted with a sample maintained captive therein.

As shown in FIG. 3B, the tube 82, which may be termed a cuvette and resembles a laboratory test tube, may be provided with a removable stopper or plug 83 formed of a resilient material which may form a tight seal in the mouth of the tube 82. The plug 83 may be formed of rubber-like material.

In practice the tube 82 and stopper 83 may form parts of a blood collection system or device sold under the trademark "Vacutainer" wherein the atmosphere is evacuated from the tube 82 after the plug 83 is assembled, and blood is collected directly into the tube 82 from a patient by the use of a needle and needle holder known and used in a conventional manner. After the sample has been flowed into the tube 82 or prior thereto, an identifying sticker 84 forming a label portion is applied directly to the tube 82 in the manner shown and bears digital information corresponding to the digital information on the label portion 74. It will be appreciated from the foregoing that the tube 82 is not assembled with the holder portion of the sample receptacle shown in FIG. 3A until after the sample has been collected in the tube 82.

It will also be appreciated from the foregoing that the sample receptacle shown in the last-mentioned view has other uses apart from that just described, that is, the holder portion thereof may receive an ordinary test tube open at the top into which a sample is poured at atmospheric pressure. In the last-mentioned case there may be no need to employ a stopper such as that shown at 83. The stopper may be omitted entirely. It will be evident that the stopper, if provided, must be removed before sample may be aspirated from the sample holder in the manner shown in FIG. 2A.

The sample receptacle of FIGS. 3A, 3B and 3C is assembled to a turntable unit in the same manner as the

sample receptacle 1 and cooperates therewith in the same manner.

The sample receptacle of FIG. 4 is very similar to the sample receptacle 3A and differs mainly in that it is adapted for use on a turntable to centrifuge a sample contained therein, which turntable may later be used in the manner shown in FIG. 2A for aspiration of a sample from the receptacle. The use of a single turntable for both centrifuging of a sample and subsequent aspiration of the sample from the sample receptacle while on the turntable forms no part of the present invention and is separately described and claimed in Livshitz et al U.S. application Ser. No. 70,199, filed Sept. 8, 1973, assigned to the Assignee of this invention.

In the form of FIG. 4, the cup portion 85 of the receptacle is similar to the cup portion 70 and the label portion 86 is similar to the label portion 73. A connector portion 87 is provided which is generally similar to the connector portion 72 except that it is provided with an extension 88 which, when the receptacle is mounted on a turntable, extends in a direction towards the center of the turntable beyond the cup portion 85. The extension 88 has a downward flange 89 thereon which together with the extension 88 forms a hook-like member, as shown in FIG. 4, to receive and swing about a pivot member 90 so that the sample receptacle may swing on a horizontal axis (in a counterclockwise direction as viewed in FIG. 4) as in a conventional centrifuge. Though the details of the turntable supporting the pivot member 90 are not shown in this view, it will be understood that the receptacle cooperates therewith in a manner similar to that described with reference to the sample receptacle of FIG. 1A to maintain the sample receptacle (to prevent swinging movement in a clockwise direction as viewed in FIG. 4) in substantially vertical position when a sample is not being centrifuged but is being aspirated from the sample receptacle and when indicia is read from the label portion 86.

While several forms of the sample receptacle have been shown in the drawings and described above it will be apparent to those versed in the art that the sample receptacle is susceptible of taking other forms and that changes may be made in details without departing from the principles of the invention.

What is claimed is:

1. In a liquid sample receptacle for support by a tray, the combination, comprising: a normally upwardly directed vertically elongated cup portion open at the top and having a side wall structure, an upwardly arranged vertically elongated plate-like label portion spaced outwardly from a portion of said side wall structure and having the vertical axis thereof substantially parallel to the vertical axis of said cup portion, said label portion having a surface thereof adapted to carry machine-readable indicia which indicia identifies the source of the contents of said cup portion, a connector portion interconnecting said cup portion and said label portion, said connector portion lying in a plane substantially perpendicular to said vertical axes of said cup portion and said label portion and having an outer margin spaced outwardly from said side wall structure, said label portion being fixedly supported from said outer margin of said connector portion, and a vessel within said cup portion supported by the latter and which directly supports said sample.

2. A liquid sample receptacle as defined in claim 1, wherein said vessel is closed and has a vacuum therein.

3. A liquid sample receptacle as defined in claim 1, wherein said vessel is removable from said cup portion.

4. A liquid sample receptacle as defined in claim 1, further comprising means in fixed relation to said label portion for retaining said vessel in said cup portion.

5. A liquid sample receptacle as defined in claim 1, wherein said vessel is removable, and further comprising means at the upper extremity of said cup portion to retain said vessel in assembled condition.

6. A liquid sample receptacle as defined in claim 1, wherein said vessel is removable said vessel having a label portion corresponding at least in part with said indicia on said label portion.

7. A liquid sample receptacle as defined in claim 1, wherein said vessel is removable, said cup portion having resilient means thereon to frictionally grip and hold said vessel in assembled condition.

8. A liquid sample receptacle as defined in claim 1, wherein said vessel is removable, said cup portion at the upper extremity thereof having a series of circumferentially spaced upwardly extending fingers integrally formed thereon which are resilient, the fingers having a separating movement when said vessel is inserted into said cup portion and frictionally retaining the vessel therein.

9. A liquid receptacle as defined in claim 1, wherein said vessel bottoms in the bottom of said cup portion.

10. A liquid receptacle as defined in claim 1, wherein said vessel bottoms in the bottom of said cup portion, and the last-mentioned bottom has means defining an upward hole therethrough of a size sufficiently small to prevent said vessel passing therethrough.

11. A liquid receptacle as defined in claim 1, further comprising means in fixed relation to said cup portion for swingably mounting the receptacle on a turntable of a centrifuge.

12. A liquid receptacle as defined in claim 1, further comprising an extension of said connector portion having means thereon for swingably mounting the receptacle on a turntable of a centrifuge, said indicia on said label portion being readable after centrifuging of said sample.

13. A liquid receptacle as defined in claim 8, further comprising an extension of said connector portion having a hook thereon for swingably mounting the receptacle on a pivot of a centrifuge turntable, said indicia on said label portion being readable after centrifuging of said sample.

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