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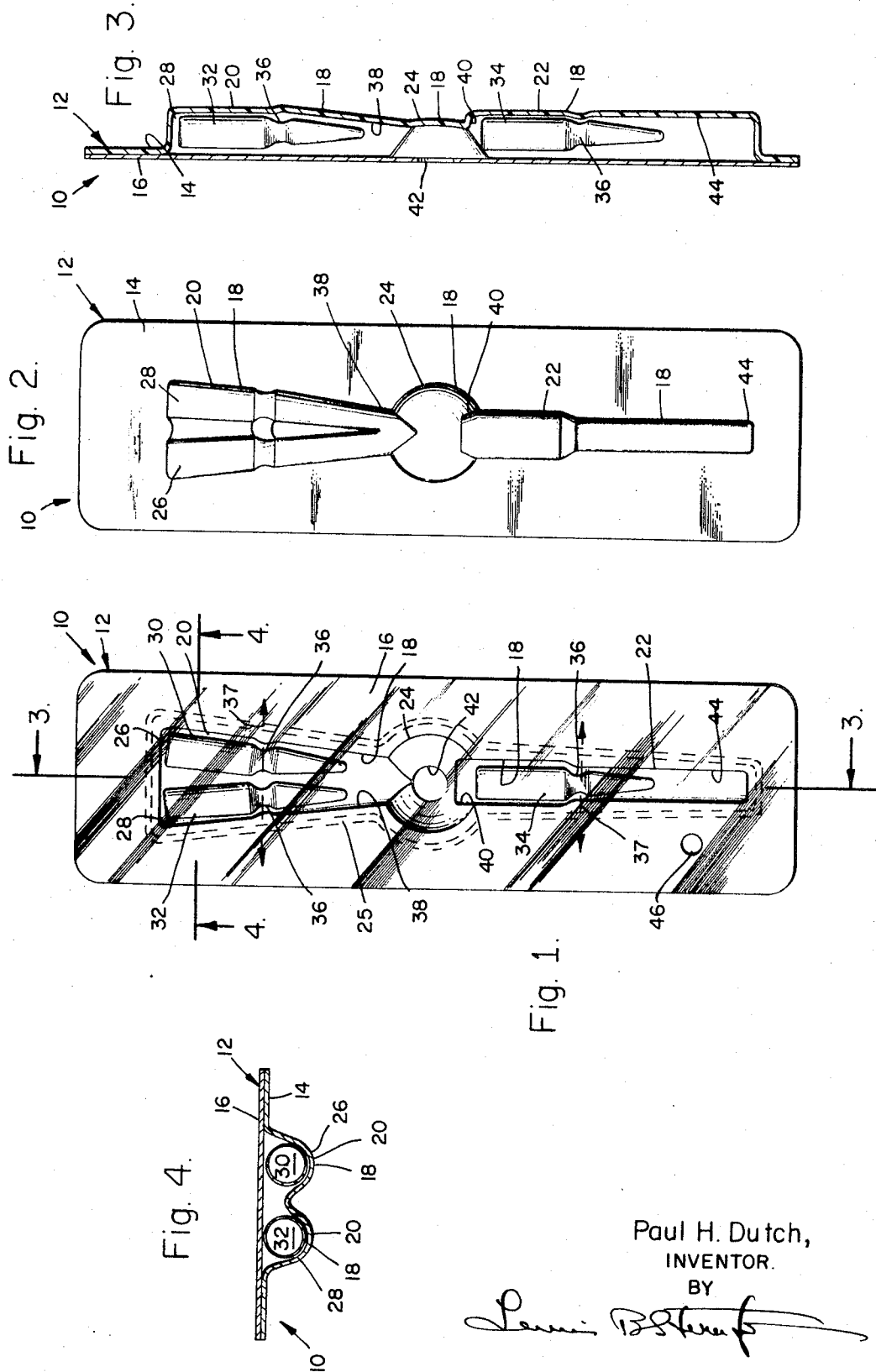
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3,748,098

PORTABLE TESTING KIT FOR NARCOTICS AND DANGEROUS AND OTHER DRUGS

Filed May 24, 1971

2 Sheets-Sheet 1



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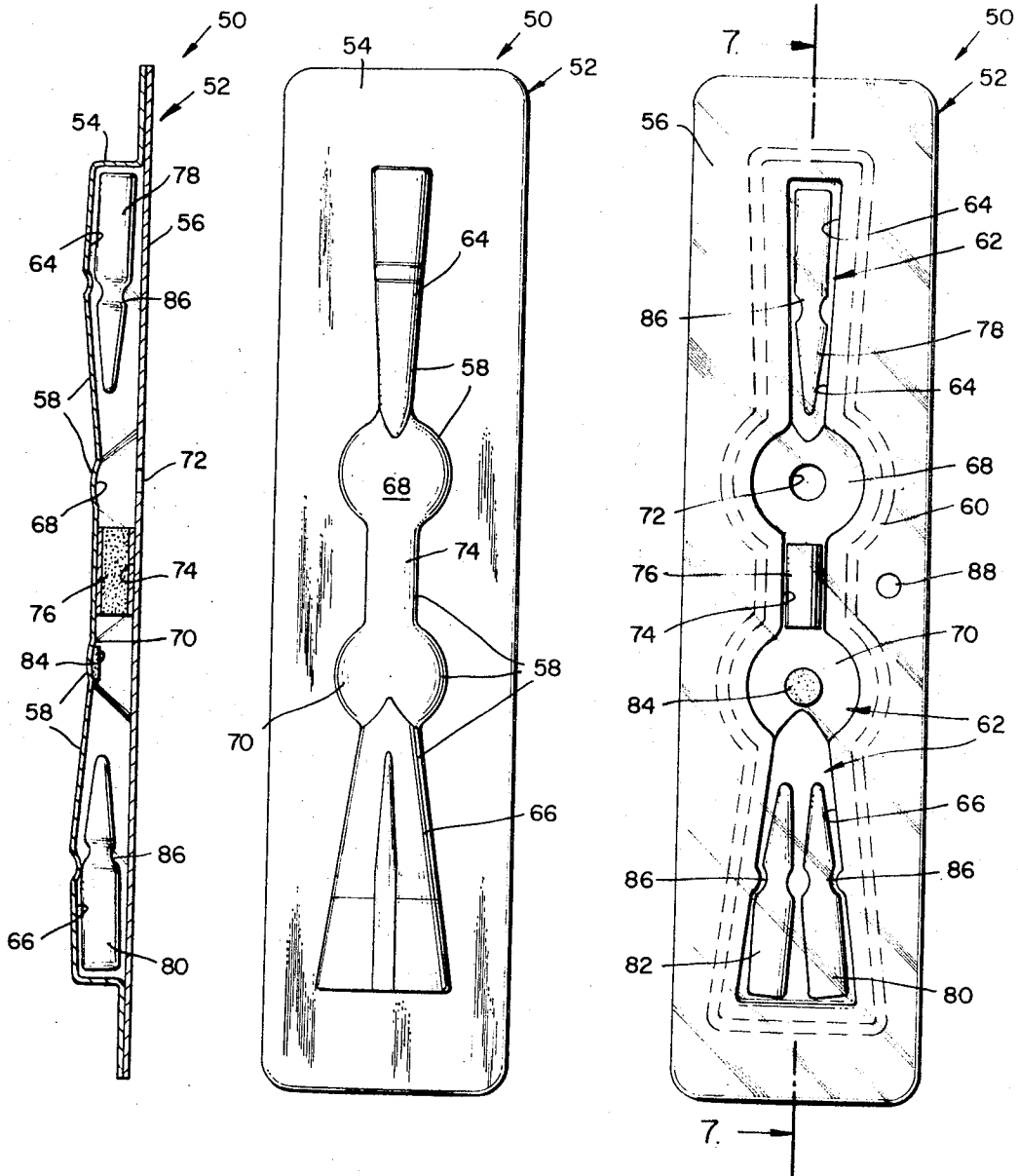
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Fig. 5.

Fig. 7.

Fig. 6.



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PORTABLE TESTING KIT FOR NARCOTICS AND DANGEROUS AND OTHER DRUGS

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9 Claims

ABSTRACT OF THE DISCLOSURE

The kit is compartmentalized wherein one or more compartments retain breakable ampoules partially filled with extraction solvents and reagents and wherein another compartment receives the specimen containing the suspected narcotic, dangerous drug, or other drug. Upon breakage of the extraction solvent ampoule, the extraction solvent is flowed into the specimen compartment for extraction of the narcotic or dangerous or other drug from the specimen. The ampoule containing the reagent is then broken to mix the reagent with the extracted narcotic, dangerous drug, or other drug to react the two in order to produce a color which is characteristic and specific to the narcotic or dangerous or other drug. To obtain further and better specificity of the suspected substance, a third ampoule positioned in a further compartment may contain an organic fluid which is immiscible with the extracted and reacted narcotic, dangerous drug, or other drug so that separation will take place after mixing has been effected.

The present invention relates to a portable kit for rapid detection of a narcotic, dangerous drug, or other drug.

Because of time or location circumstances, it is not always possible to immediately test a specimen in the laboratory to determine whether it contains or is itself a narcotic or dangerous or other drug. For example, a law enforcement officer may have reason to believe that a suspect has in his possession or has used a narcotic or dangerous drug without prescription where neither time nor circumstances permit use of laboratory services. Under such field conditions, it has not been easy to perform a simple test to detect the presence of such a narcotic or dangerous drug and, thereafter, to utilize such findings as admissible evidence during trial. As another example, many heroin addicts support their habits by selling their blood. Statistics indicate that such drug users are more likely to have hepatitis, resulting from the use of unsterilized paraphernalias, e.g., needles, which render their blood unusable for blood bank and transfusion purposes. If it were possible to determine that the blood was diseased, many instances of transferring the disease to blood recipients would be eliminated. By use of the present invention, the blood or urine of the donor could be tested for the presence of heroin and, if found in his body fluid, he could be automatically eliminated as a blood donor.

Prior testing means have required either that the narcotic or drug or specimen containing the drug be brought into a laboratory for testing or that some form of field kit be utilized. The former procedure presents no problems as to the proper identification of the narcotic, dangerous drug, or other drugs; however, as indicated above, such laboratories are not always readily available or, at least, available at the time when the test must be made. Field kits are known, but they are either cumbersome or of doubtful evidentiary value.

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The present invention overcomes these and other problems by providing a portable field kit which permits one to test a specimen for the presence of a narcotic and dangerous drug with extremely high reliability as is obtained under laboratory conditions. The present invention comprises a package which contains all the necessary chemical ingredients for extracting and reacting the suspect narcotic or drug to produce thereby a color or other characteristic which is specifically identifiable with the narcotic or drug. Briefly, the package comprises a series of compartments for reception of sealed containers of the extraction and reagent fluids and of the suspect specimen. The entire package is sealed except for a small inlet through which the suspect specimen can be inserted. Thereafter, the inlet is sealed to completely seal the package. The extraction fluid is obtained from a sealed container such as an ampoule, and is then caused to be mixed with the suspect specimen in order to extract the narcotic, barbiturate, or other drug therefrom. The reagent is obtained from another breakable ampoule and is mixed with the solution having the extracted drug. The reagent reacts with the extract to form, for example, a color which is identifiable with the specific narcotic or drug.

In a second embodiment of the present invention, a first compartment is used to extract the narcotic or drug from some body fluid, such as blood or urine, and the extract is then passed through an adsorption bed into a second compartment to remove interfering materials from the extract, that is, such materials as would otherwise interfere with the detection process. The purified extract solution is then reacted in the second compartment with the reagent to produce the color. As an additional proof for the presence of the suspect substance, a higher specificity may be obtained by using an ampoule containing an organic liquid provided in a further compartment for mixing with the extracted and reacted solution. The organic liquid is immiscible with the extracted and reacted solution so that after mixing of the two liquids, the color will migrate into the organic liquid and the two liquids will separate out into two separate layers, the organic liquid now containing the color.

A color patch is preferably located adjacent that part of the package where the colored solution is to be observed in order to provide a color comparison.

It is, therefore, an object of the present invention to provide a portable kit for rapid detection of narcotics and dangerous and other drugs.

Another object is to provide such a kit for testing a specimen if it is or contains a narcotic or dangerous or other drug.

Another object is the provision of such a kit for testing body fluids for the presence therein of narcotics, dangerous drugs and other drugs.

Another object is the provision of such a kit for performing tests in the field similar to laboratory procedures.

Another object is to provide such a kit useful as admissible evidence in criminal cases.

Another object is the provision of such a kit for indirectly ascertaining the probability of diseased blood.

Other aims and objects as well as a more complete understanding of the present invention will appear from the following explanation of exemplary embodiments and the accompanying drawings thereof, in which:

FIG. 1 is a top elevational view of a first embodiment of the present invention;

FIG. 2 is a back view of the first embodiment shown in FIG. 1;

FIG. 3 is a sectional view of the first embodiment of FIG. 1 taken along lines 3—3 thereof;

FIG. 4 is a sectional view of the embodiment of FIG. 1 taken along lines 4—4 thereof;

FIG. 5 is a front view of a second embodiment of the present invention;

FIG. 6 is a back view of the embodiment of FIG. 5; and

FIG. 7 is a sectional view of the embodiment of FIG. 5 taken along lines 7—7 thereof.

Accordingly, with reference to FIGS. 1-4, a chemical testing kit 10, particularly useful for marijuana and hashish detection, for example, since other substances may also be tested by use of this embodiment, comprises a package 12 including a backing 14 and a transparent cover 16. The backing is provided with a plurality of indentations 18 comprising bed portions 20 and 22 and an assay plate portion 24. Cover 16 is bonded to the backing about indentations 18 to form a liquid tight seal 25 indicated by dashed lines.

Bed portion 20 comprises a pair of indented sections 26 and 28 for reception therein of ampoules 30 and 32 containing respectively an extraction fluid and a reagent fluid, although the order of their placement is understood to be described solely for the purpose of clarity of description, since the placement of the extraction and reagent fluids may be exchanged. Furthermore, if the extraction solvent and the reagent fluid can be combined, then only a single ampoule need be used. Additionally, ampoule 30 may contain both an extraction fluid and one component of a two component reagent. A further ampoule 34 which contains a fluid which is immiscible with the extraction and reagent fluids is placed within bed portion 22 for purposes which will be explained presently. The ampoules are provided with narrow prescored necks 36 in order to facilitate clean breakage of the ampoules for release of the fluids therefrom. A break line 37 may be printed, taped or otherwise placed on cover 16 of backing 14 to indicate the point of breaking the ampoules. Bed portions 20 and 22 are coupled to assay plate portion 24 by canals 38 and 40 in order to couple all portions 20, 22 and 24 together in series. A hole 42 is provided in transparent cover 16 in order to provide an inlet to bed portion 24 for insertion of a specimen containing a suspected narcotic, dangerous or other drug. The hole is sealable by means of a pressure applied pad having suitable adhesive thereon.

In operation, an unknown substance, such as believed to comprise marijuana or hashish, for example, is placed through hole 42 and onto assay plate portion 24. Hole 42 is then sealed and ampoule 30 with the extraction fluid, such as ethyl alcohol, and one reagent component (Duquenois reagent) therein is broken at its neck 36 so that the fluid therefrom flows through canal 38 into assay plate portion 24. The extraction fluid extracts the dangerous drug from the specimen to form an extract and the extraction may be aided by gentle shaking of the package. In this example, the narcotic comprises tetrahydrocannabinol (THC), the hallucinogenic agent of marijuana and hashish. Thereafter, ampoule 32 is broken at its neck 36 to permit the second reagent component fluid (hydrochloric acid) to flow into assay plate portion 24 and mix with the extract solution. The reagent reacts with the extracted THC to produce a color which is blue in this example and which is characteristic with and identifies the hallucinogenic agent. Because a further test may be needed, in such cases as to distinguish between non-drugs, such as some types of tea, and the hallucinogenic agent, a further test may be made by breaking ampoule 34 at its neck 36. The fluid in ampoule 34 may comprise chloroform, carbon tetrachloride, etc., which is immiscible with the mixture of extraction and reagent fluids so that, upon mixing by vigorous shaking of the package, when

chloroform is used, the color will be transferred to the chloroform which will settle to a terminal sac portion 44 when kit 10 is held vertically. During this transference of the color, the color changes to blue-purple. The liquids will separate with the blue-purple fluid forming a lower layer and the remaining fluid an upper layer. A blue-purple color patch 46 placed adjacent terminal sac portion 44 is of the same color as the color identified with the particular narcotic, dangerous or other drug so as to facilitate identification thereof.

Now referring to FIGS. 5-7 which depict a second embodiment of the present invention particularly useful for testing of body fluids, such as urine and blood, a chemical testing kit 50 comprises a package 52 having a backing 54 and a flat transparent cover 56. The backing, as in the embodiment of FIGS. 1-4, is deformed with a plurality of indentations 58. Cover 56 is bonded, such as by hermetic means, to the backing about indentations 58, such as by a heat seal 60 in order to form a plurality of compartments 62 defined by indentations 58 and that part of cover 56 over the indentations.

The compartments are defined by the several indentations to include ampoule bed portion 64 and 66, an extraction plate portion 68 and an assay plate portion 70. A hole 72 is provided in cover 56 above extraction plate portion 68 to permit placement of a specimen onto portion 68. Plate portions 68 and 70 are connected by a channel 74 which completely encloses an adsorption bed 76. An ampoule 78 containing an extraction fluid is placed within bed portion 64 while a pair of reagents in ampoules 80 and 82 are placed in double sectioned bed portion 66. A small adsorption pad 84 may be placed in assay plate portion 70 in order to concentrate the color of the extracted and reacted solution by capillary action. Necks 86 are provided in the several ampoules in order to facilitate breaking thereof.

In operation of the embodiment of FIGS. 5-7, a body fluid is introduced onto extraction plate portion 68 through hole 72 and the hole is then sealed with a pressure sealing patch. Ampoule 78 is then broken at its neck 86 to permit the extraction fluid to mix with the body fluid and to extract the unknown narcotic or drug substance therefrom. Package 52 may be shaken to enable the proper mixing of the substance and the extraction fluid. The package is then tilted to allow the mixture to flow from plate portion 68 to assay plate portion 70 through adsorption bed 76 so as to selectively remove body fluid constituents from the remaining solution to be tested. To enhance the extraction process, the entire test plate can be placed into boiling water for a short period of time. Ampoules 80 and 82 containing reagents are then broken so as to enable the reagents to flow into assay plate portion 70 and to mix with the purified extract solution which has passed through adsorption bed 76. Upon shaking and mixing the solutions, a color is obtained which is compared with a color patch 88. If the particular reaction requires a single reagent, one of ampoules 80 or 82 may be omitted with its reagent.

As examples of narcotics, dangerous drugs, and other drugs which may be tested by the kits of FIGS 1-7, the following are presented along with the various reagents, although it is to be understood that other narcotic and drug substances may also be tested by means of the present invention. For all narcotics and dangerous and other drugs, a suitable extraction fluid comprises chloroform and alcohol although other organic liquids capable of extracting the drug and/or narcotic from the body fluid at room temperature may be used, as is well known in the art. Morphine, alkaloids and opiates, and the amphetamines are reacted by the single component reagent, Marquis reagent. Heroin is detected by Mecke reagent, a single component reagent. Barbiturates are reacted utilizing a two-component reagent known as a Dill-Koppanyi reagent. Demerol, methadone, and cocaine all

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may be reacted by cobalt thiocyanate, a single component reagent. Thus, for barbiturates, both ampoules 80 and 82 would be used, for the others, only one ampoule 80 or 82 is required.

Although the invention has been described with reference to a particular embodiment thereof, it should be realized that various changes and modifications may be made therein without departing from the spirit and scope of the invention.

I claim:

1. A portable kit for testing a specimen for the presence therein of a narcotic or drug comprising:

a package including a backing of unitary construction having a plurality of indented recess means extending in the same direction from one face of said backing and a flat transparent cover placed over the face and bonded to said backing about at least the periphery of said recess means to seal said cover to said backing and to provide a plurality of internal compartments in conjunction with said recess means; said plurality of compartments including first and second ampoule receiving bed portions, an assay plate portion positioned between said first and second ampoule receiving bed portions, canals joining said bed portions to said assay plate portion, and a terminal sac portion extending from said second bed portion in a direction away from said assay plate portion;

first ampoule means retained in said first ampoule receiving bed portion and containing extraction and reagent liquids;

second ampoule means retained in said second ampoule receiving bed portion and containing an organic liquid immiscible with said reagent and extraction liquids; and

closeable inlet means provided in said transparent cover and positioned above said assay plate portion for insertion therein of the specimen;

whereby the specimen is placed onto said assay plate portion through said inlet means, said inlet means is closed, said first ampoule means is broken to permit the extraction liquid to flow therefrom to said assay plate portion to extract the narcotic or drug from the specimen and to permit the reagent liquid to flow to said assay portion to react with the extracted narcotic or drug to obtain a solution having a color identifiable with the narcotic or drug and whereby said second ampoule means is broken to mix the organic liquid with the extracted and reacted solution for obtaining a mixture and for transferring the color to the organic liquid, to permit the mixture to gravity flow into at least said terminal sac portion, and to allow the mixture to separate in such a manner that two layers of the mixture form in which the organic liquid layer contains the color.

2. A portable kit for testing a specimen for the presence therein of a narcotic or drug comprising:

a package including a backing of unitary construction having a plurality of indented recess means extending in the same direction from one face of said backing and a flat transparent cover placed over the face and bonded to said backing about the periphery of said recess means to seal said cover to said backing and to provide a plurality of internal compartments in conjunction with said recess means;

said plurality of compartments including first and second ampoule receiving bed portions, an extraction plate portion connected to said first ampoule receiving bed portion, an assay plate portion connected to said second ampoule receiving bed portion, and a channel connecting said assay plate portion and said extraction plate portion;

first ampoule means retained in said first ampoule receiving bed portion and containing an extraction liquid;

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second ampoule means retained in said second ampoule receiving bed portion and containing at least one reagent liquid;

an adsorption bed fully received in said channel and providing the sole passage from said extraction plate portion to said assay plate portion, and adsorption bed capable of retaining interfering materials; and

closeable inlet means provided in said transparent cover and positioned above said extraction plate portion for insertion therein of the specimen;

whereby the specimen is placed onto said extraction plate portion through said inlet means, said inlet means is closed, said first ampoule means is broken to permit the extraction liquid to flow therefrom to said extraction plate portion to extract the narcotic or drug from the specimen and to form an extract solution, whereby the extracted solution is flowed through said adsorption bed to said assay plate portion to remove interfering materials from the extract solution, and whereby said second ampoule means is broken to permit the reagent liquid to flow therefrom into said assay plate portion and to thereby mix and react with the extract solution to obtain a reacted solution having a color identifiable with the specific narcotic or drug.

3. A portable kit for testing a specimen for the presence therein of a narcotic or drug comprising a sealable package including at least three compartments coupled in series, first container means in a first of said compartments sealed from the others of said compartments and second container means in a second of said compartments sealed from the others of said compartments, said first and second compartments having entry means coupled to a third of said compartments, and sealable inlet means in said package at said third compartment for insertion therein of the specimen, said first and second container means receiving extraction and reagent fluids for extraction of the narcotic or drug from the specimen and for imparting an identifiable characteristic to the extracted narcotic or drug for ascertaining the presence thereof in said specimen.

4. A portable kit for testing a specimen for the presence therein of a narcotic or drug comprising a compartmentalized package including a plurality of inter-connected container means having means sealed from one another and extraction and reagent chemicals received in at least a first of said container means for combining with the specimen in a second of said container means upon release of said chemicals from at least said first container means for the extraction of the narcotic or drug from the specimen and for the imparting of the extracted narcotic or drug with a characteristic identifiable therewith.

5. A portable kit as in claim 4 further including a fluid contained in one of said container means and being immiscible with and of different specific gravity from said extracted and characterized narcotic or drug, said fluid being mixable with an separable from said extracted and characterized narcotic or drug upon release of said immiscible fluid from said one of said container means.

6. A portable kit as in claim 5 further including a sac portion extending from said one container means for reception of said immiscible fluid and said extracted and characterized narcotic or drug.

7. A portable kit as in claim 4 wherein said second container means includes an extraction compartment and a reaction compartment coupled by an adsorption bed, said extraction and reagent chemicals respectively being contained in a first and a third of said container means, said first container means coupled to said extraction compartment and said third container means coupled to said reaction compartment, whereby the narcotic or drug is extracted from the specimen by said extraction chemical to form an extract solution in said extraction compartment, whereby interfering materials are removable from said extract solution upon flow thereof through said adsorption

bed to said reaction compartment to form a purified extract solution, and whereby said purified extract solution is reacted in said reaction compartment with said reagent chemical to obtain the imparting with the identifiable characteristic.

8. A portable kit as in claim 7 further including an adsorption pad positioned in said reaction compartment for concentrating the purified and reacted extract solution, prior to reaction with the reagent chemical.

9. A portable kit as in claim 4 wherein the characteristic comprises a specific color and further, including means exterior said container means on said package having the specific color to provide color comparison capability to the user of said kit.

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U.S. Cl. X.R.

206—56 AA, 65 A

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,748,098

Dated July 24, 1973

Inventor(s) Paul H. Dutch

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, line 72, "Meccke" should read --Mecke--

Column 6, line 6, "and adsorption" should read
--said adsorption--

Column 6, line 56, "an separable" should read --and separable--

Signed and sealed this 20th day of November 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

RENE D. TEGTMEYER
Acting Commissioner of Patents