May 12, 1964 B. C. SCHARF 3,132,744

DISPOSABLE SLIDE FIXATION FLUID PACKAGE

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FIG.1

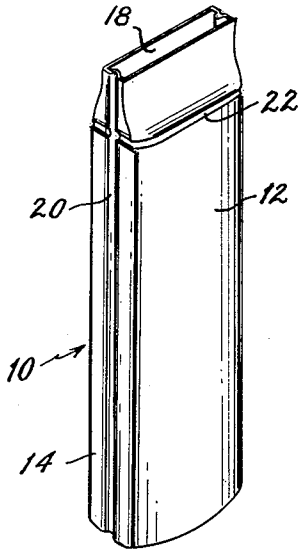


FIG.2

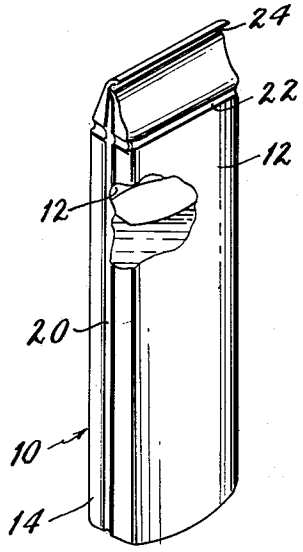
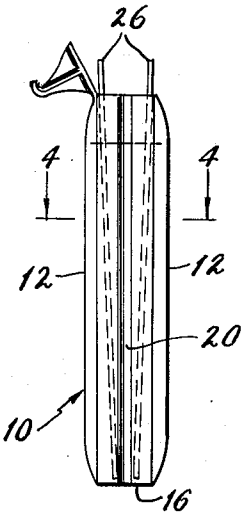


FIG.3



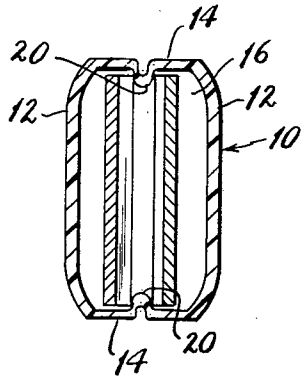


FIG. 4

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FIG.5

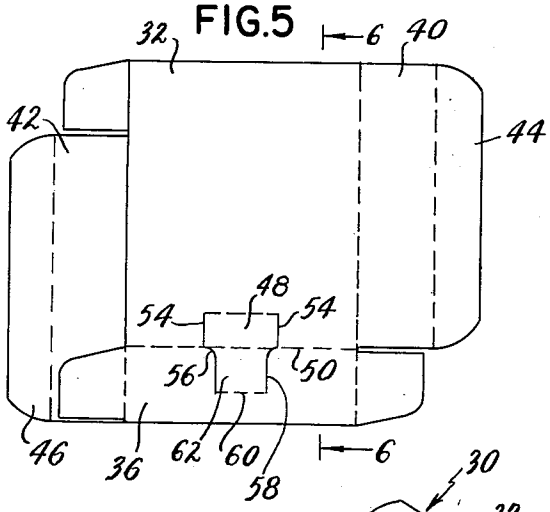


FIG.6

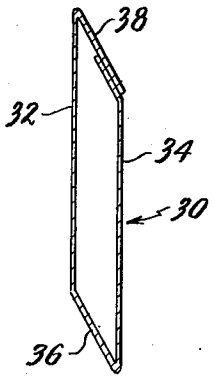


FIG.7

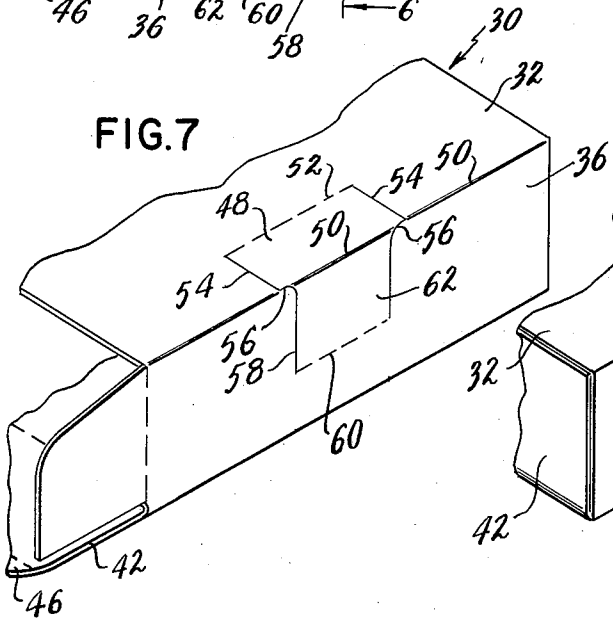


FIG.8

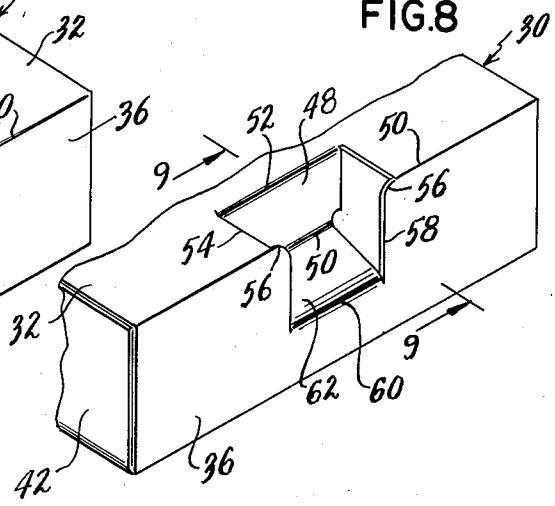
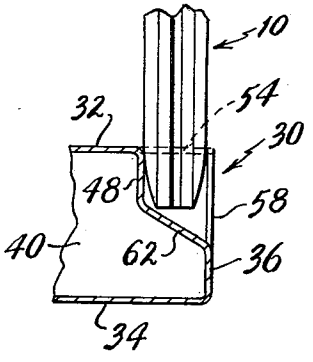


FIG.9



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DISPOSABLE SLIDE FIXATION FLUID PACKAGE

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4 Claims. (Cl. 206—84)

The present invention relates to a disposable slide-fixation fluid package and, more particularly, to a disposable fluid package for on-the-spot use in the fixation of certain specimen slides used in microscopic analysis, such as slides used for the microscopic analysis of cervical tissue, or the like.

Specimen mounting slides, of the character for which the present invention is intended to be used, are generally fixed after receiving a smear of the specimen thereon, by immersion in a fixation fluid which consists of a mixture of ether and alcohol in substantially equal proportions. Heretofore, the fixation fluid mixture was generally provided in a relatively large, wide-top container containing a large quantity of fixation fluid and provided with some form of closure, as a screw-top closure. Such fluid containers were opened and the specimen slide generally dropped into the fluid therein, to remain there for the requisite fixation period. At the end of the fixation period, the slide was removed from the container, generally by grasping with the fingers. Frequently a paper clip was secured to the end of the slide before immersion and the slide was removed by grasping the attached clip with the fingers, so as to avoid possible disturbance of the specimen on the slide. Obviously, slide fixation methods and means of the prior art, or any minor variation thereof, are quite unsatisfactory on many grounds. For one thing, because of the large quantity of liquid in the container, the liquid was used over and over again, numerous times. For another thing, the practitioner was generally likely to fail to cover the fixation fluid container during the period in which the slide is immersed in the fluid. This is not only wasteful of the highly volatile ether and alcohol; but also, since the ether and alcohol have varying rates of evaporation, the ratio of the ether and alcohol contents in the fluid is altered after a number of uses, thereby diminishing the efficacy of the fluid mixture during successive uses and necessitating the discarding of the large quantity thereof.

Additionally, the fixation methods and means as heretofore practiced and used are unsanitary because the container, as stated, is frequently apt to be left open to contamination from the air and also because of the practice of immersing the fingers into the fluid for slide removal. Further, the re-use of the same fluid for the successive fixation of subsequent slides of different origins presents a chance, even though remote, of material from one specimen slide becoming attached in some way to a succeeding slide, presenting a danger of error in analysis. Additionally, it is advisable and customary to take more than one, as duplicate, specimens from the same source, each on a separate slide, and to fix them simultaneously, for safety and assurance in microscopic analysis. The immersion of two slides, at the same time, in the fixation fluid container, presented a risk of disturbance or damage of one of the slides by the other during immersion or when removing.

It is an object of the present invention to provide a slide fixation package containing a small quantity of sealed fixation fluid which is of maximum convenience and practicality for use for the fixation of one or two specimen slides and which may hereafter be discarded or otherwise disposed of, in toto, to thereby make practical and economically feasible the fixation of each slide or set of slides in a fresh fixation fluid medium.

It is another object of the present invention to provide

a slide fixation package of the character described in which the fixation fluid is sealed at the time of packaging and remains sealed until required for use, to thereby make possible the fixation of all slides in a fluid medium of constant and accurate composition.

It is also an object of the present invention to provide a slide fixation package of the character described which may be conveniently used for the fixation of one or two slides with safety against damage from the bringing of the specimen, on either of the slides, into contact with the walls of the package, or with one another, either during insertion or fixation or removal from the fluid.

It is yet another object of the present invention to provide a slide fixation package of the character described into which the slide may be inserted and from which it may be removed without the user's hand coming into contact with the fixation fluid or with the specimen-carrying face portion of the slide.

It is still another object of the present invention to provide a slide fixation package of the character described, which is protected, before use, by a container that may serve as a stand for the package during fixation, and may be discarded after its package contents are consumed, to thereby eliminate permanent presence of a fluid container and the need for a permanent stand for the fluid package on the laboratory working surface.

It is a further object of the present invention to provide a slide fixation package of the character described which may be used after its contents have been spent in fixing of one or a pair of slides and then discarded, for the storage and protection of the fixed slide or slides during subsequent handling preparatory or subsequent to microscopic analysis.

It is a still further object of the present invention to provide a slide fixation package of the character described which is of simple construction, easy and economical to produce, and economical and convenient to use.

The foregoing and other objects and advantages of the package of the present invention will become more readily apparent to those skilled in the art from the embodiment thereof shown in the accompanying drawings and from the description following. It is to be understood, however, that such embodiment is shown by way of illustration only, to make the principles and practice of the invention more readily comprehensible, and without any intent of limiting the invention to the specific details therein shown.

In the drawings:

FIG. 1 is an isometric view of a disposable fixation liquid receptacle of the package of the present invention, before filling;

FIG. 2 is a similar view of the fixation liquid receptacle, after filling, and sealing; partly broken away to indicate liquid contents;

FIG. 3 is an end elevational view showing the filled fixation liquid receptacle open, and in use for the fixation of a pair of microscopic specimen slides;

FIG. 4 is a section, on an enlarged scale, taken on line 4—4 of FIG. 3;

FIG. 5 is a plan view of a flat-folded outer container of the package of the present invention adapted for holding one or more fluid receptacles of FIG. 2;

FIG. 6 is a section through a carton set up from a blank of FIG. 5, taken along the plane of line 6—6 of FIG. 5;

FIG. 7 is an enlarged, fragmentary view of the receptacle-supporting end of the outer container of FIG. 6, shown in set-up position;

FIG. 8 is a fragmentary view similar to that of FIG. 7, shown with the package-holding recess in set-up form; and

FIG. 9 is a section taken on line 9—9 of FIG. 8, with a receptacle set in place.

Generally stated, the package of the invention consists of a sealed, disposable receptacle, containing a minimum quantity of slide-fixation fluid, that may be cut open at one end to receive, for immersion in its liquid contents, in projecting relation, a pair of standard glass microscope slides, and has integrally formed means for spacing and keeping the pair of slides from coming into contact with one another. The package of the invention comprises a disposable outer wrapper or carton for the sealed receptacle that has provision for being converted into a stand for the fixation fluid receptacle during the period that the slides are treated therein.

Referring now, in greater detail, to the embodiment of the invention shown in the accompanying drawing, the package of the present invention comprises a relatively thin-walled container or receptacle, generally designated as 10, which may be formed by mass-production means, as by molding, from a thermoplastic synthetic resin, such as polyethylene plastic, that is inert both to alcohol and to ether and is sufficiently rigid to maintain its shape and may be easily cut by a scissors. The receptacle 10 preferably comprises a relatively elongated hollow body which may preferably have slightly curved side walls, 12, flat opposed end walls, 14, a relatively flat bottom wall, 16, and an upper portion whose end wall sections taper to provide a relatively narrow opening 18. The receptacle 10 is of an inner width substantially equal to the width of a standard glass microscope slide and of a thickness exceeding the thickness of a pair of such microscope slides, and the end walls 14 are each formed with a centrally-disposed, longitudinally-extending groove on their exterior, providing an inner rib, 20; the distance between the ribs 20 of the opposed end walls 14 on the interior of the receptacle being less than the width of a standard microscope slide, so that the two ribs in the end walls divide the receptacle with substantially two compartments opening into one another, each of which is able to accommodate a standard microscope slide and to retain the same within it against movement into the adjacent compartment.

The receptacle 10 may be of an overall length preferably slightly exceeding the length of a standard glass microscope slide, with the non-tapered portion thereof being of a length less than the length of such slides.

The receptacle is provided at its upper end, immediately adjacent to the tapered portion thereof, with a peripheral groove, 22, extending around the four sides thereof, adapted to serve as a cutting line indicator.

The receptacle may be filled from its opening 18 with the desired quantity of fixation liquid and then heat-sealed at the end of its tapered portion to form a closure, 24.

For use, the receptacle 10 may be cut along the cut-indicating line, 22 as by a knife or a razor blade or a scissors, preferably only on three sides thereof, so that the tapered top remains connected to the receptacle, and the specimen-carrying slides, 26, inserted into the receptacle for fixation by its liquid contents through the opening provided by the cutting-away of the tapered top portion; each slide being inserted into one of the compartments formed by the ribs 20, so that the two slides do not come in contact with one another. The slides 26, being of greater length than the portion of the receptacle below the groove 22, will project slightly from the receptacle, to permit their withdrawal, after fixation, without the fingers of the person withdrawing them coming into contact with the wetted portion of the slides or with the liquid contents of the receptacle.

The package of the present invention also comprises an outer wrapper or carton for one or more of the receptacles 10. Such carton is illustrated in FIGS. 5–9 of the drawings, and is generally designated as 30. The carton 30 may preferably be formed of a unitary cardboard blank which is scored and folded to provide a first pair of parallel walls, 32 and 34, which, for convenience, may be designated as top and bottom walls, respectively, of the carton, which are connected at their ends by a pair of upright connecting walls, 36 and 38, one of which, as 38, may be formed by overlapping extensions of the walls 32 and 34, as shown in FIG. 6 of the drawings. Each of the walls 32 and 34 may be provided with an offsetably foldable extension, 40 and 42, respectively, each provided with an inwardly foldable flap, 44 and 46, respectively, which extensions 40 and 42 with their flaps 44 and 46, may each serve as a closure for the carton.

One of the walls of the carton, as the top wall 32, may be provided with a tearaway tongue, 48, adjacent the foldline, 50, connecting it with an adjacent wall, as the connecting wall 36. The tongue 48 is defined by a foldline, 52, parallel to the foldline 50, and spaced therefrom a distance substantially equal to one of the cross-sectional dimensions of the receptacle 10, as its thickness, and of a length equal to the other of the cross-sectional dimensions of the receptacle 10, as its width. The tongue 48 is further defined by parallel cut or foldlines, 54, connecting the foldline 52 with the foldline 50. The cut or tear lines 54 are each extended part-way toward one another, as at 56, and then continued into the connecting wall 36, part of its height, as indicated at 58; with a foldline, 60, connecting the extremities of cut lines 58 to define a tongue extension, 62, of narrower width than the tongue 48.

In use, pressure is applied on the tongue 48 and tongue extensions 62, to offset them inwardly into the carton, to provide a recess in the carton 30, through the top opening of which the bottom portion of the receptacle 10 may be inserted to hold the receptacle in upright position between the edges provided by the cutline portion 54, the wall formed by the now depending tongue 48 and the portions of the connecting wall 36 to each side of the opening formed by the inward depression of the tongue extension 62, which is now substantially horizontally disposed and serves as a support for the bottom of the receptacle 10.

This completes the description of the disposable slide fixation package of the present invention, the manner of its assembly, as well as the manner in which it is to be used. It will be readily apparent that such disposable slide fixation package may be easily and conveniently mass-produced at relatively low price, to make its disposability economically practical. It will also be apparent that such package is easy and convenient to use, because it is compact and occupies a minimum of space on a laboratory table, and occupies such space solely when in actual use; because it provides highly safe, sure and sanitary fixation for the slide-mounted specimens, with the fixation fluid being always at uniform, standard strength and clean and uncontaminated from any source.

It will likewise be apparent that the package of the present invention permits the fixation of a pair of slide-mounted specimens at one time, with a minimum of risk of disturbing the specimens on the slides, and that when the fixation liquid is emptied, the receptacle may serve as a safe storage means for the slides until they are microscopically examined, and thereafter.

It will be further apparent that numerous modifications and variations in the disposable slide fixation package of the present invention may be made by anyone skilled in the art, in accordance with the principles of the invention hereinabove set forth, and without the exercise of any inventive ingenuity. I desire, therefore, to be protected for any and all such modifications and variations that may be made within the spirit of the invention and scope of the claims hereto appended.

What I claim is:

1. In a disposable package for use in the fixation of specimen-mounting slides for microscopic analysis, comprising a hermetically sealed thin-walled thermoplastic hollow body including a pair of spaced walls defining the width of the body and a pair of spaced substantially

flat walls connecting said first-named walls and defining the thickness of said hollow body, said walls connected by a bottom wall at one end and having free edges at their opposed ends, said hollow body being of an inner width equal substantially to the width of a glass microscope slide, said second pair of walls each having a longitudinally-extending rib on their inner surface, said ribs spaced from one another a distance less than the width of a glass microscope slide, each said rib spaced from an adjacent one of said first pair of walls a distance exceeding the thickness of a glass microscope slide and extending from said bottom wall in the direction of the other end of said hollow body, said hollow body containing fixation fluid and having the free ends of its walls heat-sealed to one another.

2. The package of claim 1, wherein said second pair of walls taper towards their free ends.

3. The package of claim 1, wherein said hollow body is formed with a peripheral groove defining a cutting

line, the distance between said groove and said bottom wall of said hollow body being less than the height of a glass microscope slide.

4. The package of claim 1, wherein said second pair of walls taper toward their free ends and said ribs extend from said bottom wall to at least said tapered portion of said other pair of walls.

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