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M. GROZIN

2,304,817

PATCH TEST

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FIG. 1

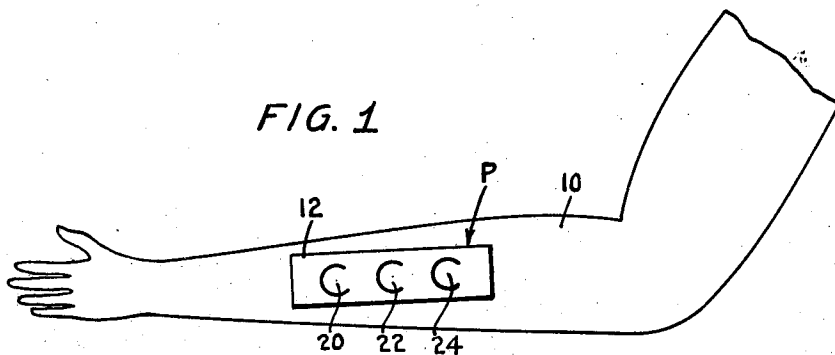


FIG. 2

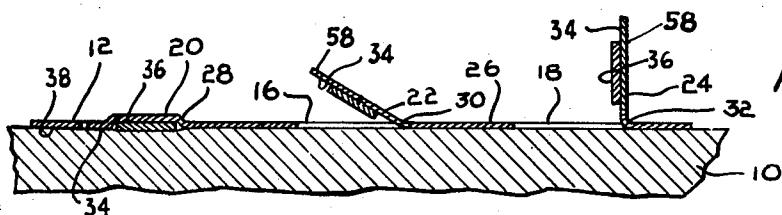
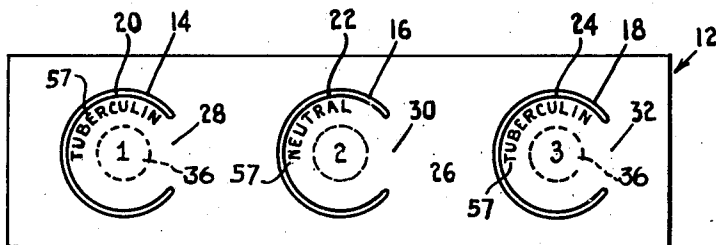


FIG. 3

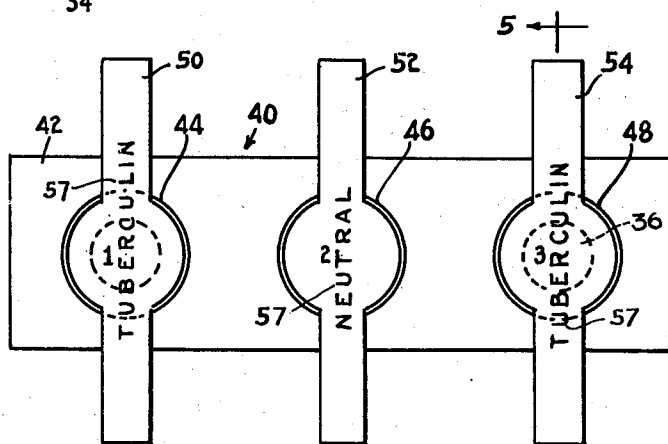


FIG. 4

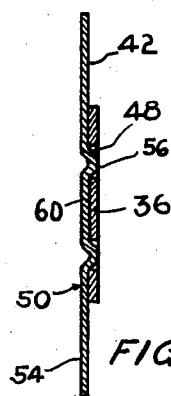


FIG. 5

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2,304,817

PATCH TEST

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2 Claims. (Cl. 128-2)

This invention relates to patch tests.

The patch test to be discussed herein will be considered in particular relation to its use in determining infection of a suspect with tuberculosis. However, the application of the test for other purposes will, from the description of structures and method of use, become obvious.

Such patch test has been found to have specific adaptability for carrying on testing in which tuberculin, or a similar medium, in varying concentrations, is brought into contact with the skin of a suspect. The patch test of this invention provides, among other things, for facility in the observation of the reaction which then takes place, both during the time the reaction is going forward, and after the reaction has been completed.

Many different methods of testing have been followed in the past, including a technique in which not only was the skin of the suspect penetrated by an instrument such as a hypodermic needle, but, in fact, the technique required that a substantial breach should be made in the skin of the suspect so that the test ingredient might properly react. Such technique, of course, gave great pain to the suspect; if the suspect were a child,—these tests have appreciable value in mass testing in schools and in similar relations where large numbers of children assemble,—the antagonism of the child became an important obstacle to be overcome. The fear of the child, in many cases, has been a problem of major proportions in connection with these tests.

Tests, wherein an ingredient has been applied to the skin, have been used. However, the technique in such cases, and the apparatus availed of, have resulted in complete concealment of the reaction area at all times throughout the entire period of reaction. To observe the reaction, the technician was required roughly to estimate the time necessary for the reaction to go to completion, and then allow himself a margin of error. He did not remove the reaction-concealing means until well beyond the time the reaction should have been completed. Then, and then only, was he able to determine the stage, if any, to which the reaction might have progressed.

In some cases, the reaction time thus allowed by the technician might have been insufficient. This required renewal of the test procedure. In other cases, the reaction might have gone for too long a time. In such case, deleterious effects might have been produced, and the technician would have been none the wiser until he had completely destroyed the test means as located upon the skin of the suspect. It has not been found feasible, in the past, to replace the test means properly in association with the test area, especially where a change of the ingredient,

either in substance or in quantity, has been indicated as desirable or required. In such cases, the entire test procedure has been required to be commenced anew from the very beginning.

It is an object of the invention to provide a patch test wherein the progress of the reaction may be observed at any time that the patch test is in position upon the skin of the suspect, and such observation may be effected without dislocation of the locale of the reaction, and without in any way reducing the effectiveness of the test reaction.

It is an object of the invention to provide a patch test, wherein, during the progress of the reaction, the reaction state may be observed, and the conditions of the reactions may, at the time of such observation, be revised under the control of the technician and in accordance with the indications derived from such observations. Such change may, for instance, be effected by a change of ingredient or its concentration.

It is an object of the invention to provide a patch test wherein, throughout the test, the locale of the reaction remains fixed, but the reaction conditions may be varied at the option of the technician, so that a number of reactions under different conditions may be observed in connection with a single fixed reaction area.

It is an object of the invention to provide a patch test by the use of which the technician is enabled to make his diagnosis of a condition for which the test is being carried on earlier with relation to the time when the indications become apparent, so that the use of such a test makes it possible to avoid danger of unnecessary inflammation which arises in some cases from contact of the skin of the suspect with the test medium over too long a period.

It is an object of the invention to provide a patch test the use of which permits the technician to study the different stages of the reaction from the very application of the test, through the initial latent period before the skin being tested may have responded to the ingredient, and then through the final stages of indication, negative or positive, or reaction by variation of the test media, while the patch test remains in the same position on the skin of the suspect.

It is an object of the invention to provide a patch test wherein, because of limitation of the area of reaction exposed to view, by definition of the space within which the reaction takes place, determination of the state of the reaction, at any of its stages, is made simpler.

Other objects of this invention will be set forth hereinafter, or will be apparent from the description and the drawing, in which are illustrated embodiments exemplifying the invention.

The invention, however, is not intended to be restricted to any particular construction, or any

particular arrangement of parts, or any particular application of any such construction or arrangement of parts, or any specific method of operation, or any of various details thereof, herein shown and described, as the same may be modified in various particulars, or be applied in many varied relations, without departing from the spirit and scope of the claimed invention, of which the exemplifying embodiments, herein shown and described, are intended only to be illustrative, but not to show all the various forms and modifications in which the invention might be embodied.

On the drawing, in which the same reference characters refer to the same parts throughout, and in which the exemplifying embodiments appear:

Fig. 1 is an elevational view of an arm having a patch test applied thereon;

Fig. 2 is a plan view, to enlarged scale, of the patch test shown in Fig. 1;

Fig. 3 is a longitudinal cross-sectional view showing the manner in which the patch test is applied to the arm of Fig. 1, and illustrating the method of manipulation thereof to ascertain the intermediate states of reaction;

Fig. 4 is a plan view of a patch test of modified construction; and

Fig. 5 is a transverse cross-sectional view substantially on the line 5—5 of Fig. 4.

On the drawing, a patch test P is shown as it would appear, applied to the skin of the arm 10 of a suspect. Patch test P may be applied by means such as a strip 12; strip 12 may be a piece of material cut or formed as shown in the shape of an oblong, although such shape, or the specified type of material used for strip 12, may not be of specific importance. In one case, strip 12 has been made from material such as used in the manufacture of the well-known adhesive tapes used in connection with medical dressings, that is, a closely woven strip capable of having an adhesive face formed on one side by the application of an adhesive coating.

In the case of strip 12, shown in Fig. 2, a number of openings 14, 16 and 18 have been formed in the strip. The number of openings may be determined by the nature of the test or tests to be carried on, whether simultaneous tests with the same test medium are desired, or whether it is desired to carry on simultaneously a plurality of tests with a plurality of test media. Openings such as openings 14, 16 and 18 may be defined in strip 12 by cutting or otherwise severing the material of strip 12. In the instance shown, the material of strip 12 has been severed just sufficiently so as to define flaps 20, 22 and 24. Sufficient of the material at each flap is left unsevered so that, while the flaps are free to move out of openings 14, 16 and 18 to uncover the skin areas defined by the openings, and to be moved into and to fill the openings, still the flaps remain secured to the main body 26 of the material of strip 12, merely hinging upon the respective sections 28, 30 and 32, respectively, connecting the flaps to main body 26.

The material from which strip 12 is formed is of sufficient thickness to give body to the flaps, and also to assure that, when the flaps are hinged to move into position within openings 14, 16 and 18, the flaps will be retained securely in position by engagement of the edge walls of flaps 20, 22 and 24 with the walls of openings 14, 16 and 18, respectively.

Faces 34 of flaps 20, 22 and 24 which, when 75

the flaps are seated within their respective openings, are in contact with the skin of the suspect, may have means applied thereto to fix the relationship of the flaps with relationship to the skin, and, therefore, with relation to the walls of the openings, or to assist in so locating the flap. Such means, in one instance, may take the form of an adhesive coating on each of faces 34. The coating may, if desired, be the same type of adhesive coating generally used for adhesive tapes used in medical dressings.

The test medium or media, as, for instance, tuberculin or similar substance, which is to be brought into juxtaposition to the skin of the arm 10 so as to study its reaction therewith, may be made an integral part of the patch test so that a particular patch test with a particular test medium, or with different test media of various compositions or concentrations, may be capable of being supplied. In such case, the particular medium or media, in the proper concentration, is applied in any desired manner to face 34 of the respective flaps 20, 22 and 24. The method of incorporation of the test medium with face 34 is not a specific requirement of the invention. Some material, as, for instance, absorbent cotton, absorbent bandage, or similar material, may have been impregnated with the test medium, and then the impregnated material may have been cut up into small sections. If face 34 of the flaps has had a coating of adhesive material applied thereto, one of these sections 36 may be adhered to face 34. In such case, section 36 desirably will be less in extent than the effective area of the flap to permit the flap to present to the skin of the suspect at least substantial perimetric portions of adhesive-coated surface to engage the skin for holding the flap with relation to the test area. Also the test medium may originally have been in the form of a solution of the active ingredient, and have been dropped upon the coating of face 34, and then permitted to dry into the coating.

After strip 12 has been located on the skin of the suspect, the reaction may be observed at any time the technician desires merely by lifting the flap out of its respective opening. The skin at such location is thus exposed and is capable of thorough inspection to determine the state of the reaction. After the technician has completed his observation, he merely bends and pushes the flap back into position, sealing the opening, and bringing the flap and the test medium again into contact with the skin so that the reaction may then continue.

In order to afford a control with which the reactions at the different areas may be checked, the test medium may be omitted from one of the skin areas covered by a flap, or an ingredient which is wholly without reactive effect upon the skin of a suspect may be applied to the flap or may otherwise be brought into conjunction with the skin of one area. Thus, by lifting the flap at an area at which a positive test medium is present and the flap at an area where the neutral ingredient is effective, the true and relative condition of the reaction upon the skin of the test medium may be studied directly.

In order to assure that strip 12 adhere to the skin as a whole, those portions of the strip, at face 38, which are not included in a flap, may have a coating of an adhesive substance applied thereto. This adhesive substance may be the same as or similar to the adhesive used upon face 34.

On Fig. 4, patch test 40 of modified construction is shown. Patch test 40 may comprise a strip 42 of material through which a plurality of openings 44, 46 and 48 extend. Strip 42 may be applied to and be retained in position upon the skin of the arm substantially in the same way as indicated for strip 12. No flaps are provided at openings 44, 46, and 48.

Patches 50, 52 and 54 are provided, and are of such dimensions that they may be positioned upon strip 42 so that each of patches 50, 52 and 54 will close one of the respective openings 44, 46 and 48. Patches 50, 52 and 54, respectively, may have been prepared as carriers of a test medium in the manner hereinbefore discussed for flaps 20, 22 and 24. Likewise, one of the strips, as, for instance, strip 52, may be a carrier for an ingredient which will be wholly without effect upon the skin of a suspect, in the same manner as one of the flaps, say flap 22, was so provided.

Patches 50, 52 and 54 may have an adhesive coating upon their faces 56 which are, at least in part and at openings 44, 46 and 48, brought into contact with the skin. This adhesive contact serves, in addition to the adhesive action of strip 42 itself, to anchor strip 42 in position, and thus fixedly to locate the reaction areas defined by openings 44, 46 and 48.

Patches 50, 52 and 54 are shown as positioned on strip 42 to extend transversely of the width of strip 42. Patches 50, 52 and 54 may be slightly longer than the width of strip 42 so that portions of these strips will bend over the edges of strip 42, and adhesively attach themselves to the skin of the suspect. Simply by lifting any one of patches 50, 52 and 54 to disengage it from its engagement with the skin of the suspect, and then to free it from its covering relation over the respective opening, is all that is necessary to permit inspection of the reaction area at the selected opening. Strip 42 is in no way affected nor is the reaction area in any way changed. After the inspection, the particular patch is pushed back into position, so that the reaction may continue as before, without change or disturbance of the reaction area.

Thus, in either of these cases, the progress of the reaction may be determined at any time. Immediately that such observation discloses the presence of the condition for which the test is being made, the patch test may be removed from the arm. If, however, no such positive reaction has appeared, the technician, if he so desires, may change the test medium at that particular reaction area. For instance, in the case of test for tuberculosis, a drop or similar quantity of tuberculin may be added to the reaction area through the opening, and then the opening may be closed by means of a flap or a patch, according to which patch test is used. For instance, such change may be either a change of concentration, or a change of ingredient. In either case, without changing the location of the patch test, the change can be effected by depositing a drop of the test medium upon skin, flap or patch, and then returning flap or patch into its reaction position. It should be understood that, under certain conditions, this method of placing the ingredients of the test medium in juxtaposition to the skin upon which the test is to be carried out may be used in placing the patch test in action at the very beginning of such a reaction. Observation of the

progress of the reaction is thus possible, and the reaction may be terminated as soon as any positive indication appears.

Information regarding the particular ingredient upon a particular flap or upon a particular test patch may be imprinted, in the form of indicia 57, upon face 58 of the flap or upon face 60 of the patch. For instance, the patches may be supplied separately from strip 42, in which case such identification would be of material importance.

Many other changes could be effected in the particular apparatus designed, and in methods of operation and use set forth, and in specific details thereof, without substantially departing from the invention intended to be defined in the claims, the specific description being merely of exemplifying embodiments in accordance with the statutes.

What is claimed as new and useful is:

1. A patch test for use in determining the pathological reaction of a human body to tuberculin and similar substances, the test including a strip of substantially flexible material, the strip having means on one face for adhesively retaining the strip in position upon and in a fixed relation to a portion of the skin of the body, the strip having a plurality of openings therethrough at spaced apart positions, sections of the strip being partially severed from the strip to define the openings and to form flap sections including the adhesive means, each flap section being capable of movement relative to the strip into contact with the skin of the body to close its opening and to be retained in engagement with the skin at the opening or away from the skin of the body to permit inspection of the skin through its opening, the flap sections remaining engaged with the strip so as not to become separated therefrom, one or more of the flap sections having tuberculin or similar test ingredient applied thereto, a flap section having the ingredient applied thereto being movable relatively to the strip without disturbance of the relation of association of the strip to the respective opening.

2. A patch test for use in determining the pathological reaction of a human body to tuberculin and similar substances, the test including a strip of substantially flexible material, the strip having means on one face for adhesively retaining the strip in a fixed relation to a portion of the skin of the body, the strip having an opening therethrough, a section of the strip being partially severed from the strip to define the opening and to form a flap section including the adhesive means, the flap section being capable of movement relative to the strip into contact with the skin of the body to close the opening and to be retained in engagement with the skin at the opening or away from the body to allow inspection of the body through the opening, the flap section remaining engaged with the material of the strip so as not to become separated therefrom, the flap section having tuberculin or similar test ingredient applied thereto, the flap section, when not moved away from the strip, being in position to maintain the ingredient in contact with the skin at the opening, the flap section being movable relatively to the strip to permit inspection of the skin at the opening without disturbance of the associated relationship of the strip and the skin at the opening.

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