

UNITED STATES PATENT OFFICE.

KARL DIETERICH, OF HELFENBERG, GERMANY.

TESTING-PAPER AND METHOD OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 691,249, dated January 14, 1902.

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To all whom it may concern:

Be it known that I, KARL DIETERICH, a subject of the King of Saxony, residing at Helfenberg, near Dresden, Germany, have invented certain new and useful Improvements in Compound Chemical-Testing Papers and Processes of Making the Same; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to chemical-testing paper, and has for its object to provide an improved compound testing-paper for testing different solutions, such as acids and alkalies, at one operation and an improved process for making such compound paper.

The need of a testing or litmus paper which is not alone sensitive, as the usual blue paper, to acidity or, as the usual red paper, to alkali, but which simultaneously reacts upon both the acid and alkali, has led to the manufacture of the so-called "neutral" reacting litmus-paper. This neutral paper by a certain neutralization of the color material in violet-colored manufactured paper has the disadvantage that it is not durable and is always uneven in its sensibility, being either excessively sensitive to acidity, or vice versa, to alkali.

The object of this invention is to provide litmus-paper, as well as other test-papers, with all possible coloring and testing qualities, in which a plurality of sheets of the testing-papers are placed one beside the other, but separated from each other. This, however, is not easily possible, for instance, with red and blue litmus colors, because of the porosity of the paper, be it filtering or writing paper, which allows the different solutions of coloring-matter to run into each other. Even when this should not be the case at the beginning in storing up the paper a gradual exchange of colors through the various sheets of the paper would occur. In my invention this inconvenience is obviated by placing between the different strips of coloring-paper a very narrow strip of a substance which renders the paper at this place impermeable to liquid solutions and, so to say, "insulates" the different strips of testing-papers. This can

be successfully done by saturating the separating-strips with a substance like paraffin, ceresin, wax, varnish, &c., or any other substance which is as odorless as possible and which is indifferent alike to acid or alkaline solutions.

The paper of which it is intended to make the compound testing-paper is first provided with very narrow separated insulating strips or coatings of heated ceresin or any of the before-named substances, and between these insulating-strips alternate coatings of the different reacting color materials are applied. It is sufficient to apply the insulating mass and also the reacting material on one side only of the paper, as it penetrates sufficiently into the paper. Thus the red and blue coloring-matter of litmus can be placed parallel upon one paper, and in the same manner any desired acting body of animal or synthetic origin may be used. Also when the quantities of the acting bodies are varying narrow or wide strips of not only two, but several, acting bodies can be applied side by side, or on one sheet twenty to thirty strips of red litmus-paper can be united with twenty to thirty strips of blue. In each case two or more reactions can be executed or tested at once by coating one piece of paper. The compound may also have strips of the ordinary testing-papers pasted upon it instead of being colored in strips, if so desired.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A process of manufacturing testing-paper which is sensitive to two or more chemical substances by first providing the paper with narrow insulating strips or coatings of a substance impervious and as far as possible indifferent to the chemicals to be tested, and thereafter applying the different testing substances in parallel, separated strips on the paper, substantially as described.

2. A compound chemical-testing paper consisting of a sheet of paper having separated strips of testing coloring or material thereon, separated by insulating-coatings on the paper, substantially as described.

3. A compound chemical-testing paper consisting of a sheet of paper having separated

strips of testing coloring or material thereon, separated by insulating-coatings on the paper, the various strips of testing material being sensitive to different chemical substances,
5 substantially as described.

4. A compound chemical-testing paper consisting of a sheet of paper provided with adjacent but separated strips of blue and red litmus coloring, separated by strips imper-

vicious to acids and alkalies, substantially as described. 10

In testimony whereof I affix my signature in presence of two witnesses.

KARL DIETERICH.

Witnesses:

HERNANDO DE SOTO,
PAUL ARRAS.