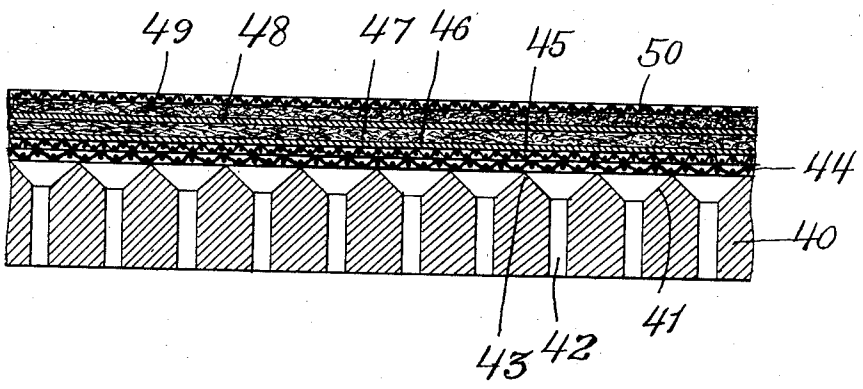
H. K. MOORE.

CATALYST.

APPLICATION FILED APR. 4, 1916.

1,326,767.

Patented Dec. 30, 1919.



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UNITED STATES PATENT OFFICE.

HUGH K. MOORE, OF BERLIN, NEW HAMPSHIRE, ASSIGNOR TO BROWN COMPANY, OF BERLIN, NEW HAMPSHIRE, A CORPORATION OF MAINE.

CATALYST.

1,326,767. Specification of Letters Patent. Patented Dec. 30, 1919.

Original application filed October 31, 1914, Serial No. 869,689. Divided and this application filed April 4, 1916. Serial No. 88,924.

To all whom it may concern:

Be it known that I, HUGH K. MOORE, a citizen of the United States, residing at Berlin, in the county of Coos and State of New Hampshire, have invented new and useful Improvements in Catalysts, of which the following is a specification.

This invention relates generally to the hydrogenation or reduction of unsaturated compounds, such as the fatty acids, their esters or their glycerids, and more particularly to catalysts for use in such hydrogenation or reduction.

As described in Letters Patent No. 1,121,860, granted to me December 22, 1914, such compounds may be more or less completely hydrogenized by forcing the same in finely divided condition and in admixture with hydrogen through a body or layer of finely divided catalytic material supported upon a layer of material pervious to the compound and to gas but impervious to the catalytic material. As pointed out therein, it is unnecessary to deposit the catalyst upon pumice, kieselguhr or the like, as preferably it is in a pure finely divided state and in a layer sufficiently thin to permit the passage of the gas and the compound therethrough.

I have found that, when a layer of a catalytic material is formed in or is supported by a diaphragm in the hydrogenating apparatus, there is a possibility of cracks forming therein, through which a portion of the compound to be hydrogenized may pass without the addition of hydrogen thereto, and that the resulting product may therefore vary from the desired standard. To overcome this trouble, I provide a binder for the layer of catalytic material, which will mechanically operate to prevent the formation of cracks or fissures. Any suitable, preferably inert material may be used for this purpose, such as long asbestos fibers which may be mechanically mixed with the catalyst.

On the accompanying drawing the figure represents a diaphragm and its support, such diaphragm including several layers of catalytic material and a binder therefor.

Referring to said drawing, 40 indicates a grid or support adapted to be located within the casing or shell of a hydrogenating apparatus such as described in my co-pending application Serial No. 869,689, filed October 31, 1914, of which this is a division. The upper surface of the grid is provided with intersecting V-shaped grooves 41, the bottoms of which communicate with the apertures 42. Thus the upper surface of the grid is provided with a series of rows of pyramidal projections 43. This grid is utilized for supporting the diaphragm. Upon it may be placed a sheet of heavy steel wire cloth 44 which is preferably rolled to flatten the exposed surfaces of the wires. The rolling of the cloth stiffens it and securely interlocks the wires. Upon the wire cloth 44 may be placed a second sheet of wire cloth 45 formed of much finer wire and with much smaller mesh. These three elements, to wit, the perforated grid and the two layers of wire cloth constitute a support for the diaphragm, and the construction and arrangement are such that the diaphragm is supported at very closely adjacent points where it comes in contact with the fine wire cloth, to prevent its yielding or breaking. Upon the wire cloth 45 is placed a sheet 46 of inert material, such as asbestos paper, which is pervious to oil and gas but impervious to the catalytic material. The catalytic material is in a finely divided state and may be formed of the usual metals, including, for example, palladium, platinum, nickel, etc. Assuming that nickel is to be used as the catalyst, nickel oxid in a finely divided condition is thoroughly mixed with long or stringy asbestos fiber, and a layer thereof is placed upon the sheet 46 as indicated at 47. A second sheet 48 of asbestos may then be placed upon the layer 47, and a second layer 48 of nickel oxid and asbestos laid thereon as indicated at 49. To hold the layers in place, there is located above them a sheet 50 of fine wire cloth.

I have stated that the layer of catalytic material contains in mixture therewith long fibered asbestos. This is a mechanical mixture, the asbestos being utilized to prevent the layer of catalytic material from cracking, very much as hair has been used in plaster for a similar purpose. Only a small quantity of asbestos fiber is necessary for the purpose. After the diaphragm is formed with nickel oxid, for instance, for providing the catalytic material, hydrogen at the proper temperature is passed therethrough

to reduce it to its active condition. The reduction takes place at approximately 570° F., and hence the gas is heated preferably to a temperature between 600° F. and 650° F. before being brought into contact with the diaphragm. For a more complete description of the treatment of the gas, reference may be had to my said application.

Having thus explained the nature of my said invention and described a way of making and using the same, although without attempting to set forth all of the forms in which it may be made or all of the modes of its use, what I claim is:

1. A catalyst for hydrogenating unsaturated compounds, consisting of a layer of active catalyzing material admixed with but not precipitated or deposited upon a fibrous binder.

2. A catalyst for hydrogenating unsaturated compounds, consisting of a layer of active catalyzing material admixed with but not precipitated or deposited upon inert fibers which act as a binder for the catalyzing material.

3. A catalyst for hydrogenating unsaturated compounds, consisting of a layer of active catalyzing material admixed with but not precipitated or deposited upon asbestos fibers to prevent the layer from cracking.

In testimony whereof I have affixed my signature.

HUGH K. MOORE.