

UNITED STATES PATENT OFFICE.

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HÖCHST-ON-THE-MAIN, GERMANY, A CORPORATION.

REDUCING INDIGO.

SPECIFICATION forming part of Letters Patent No. 723,007, dated March 17, 1903.

Application filed July 29, 1902. Serial No. 117,541. (No specimens.)

To all whom it may concern:

Be it known that we, RUDOLF MÜLLER, Ph. D., and OTTO SCHWAB, Ph. D., citizens of the Empire of Germany, residing at Höchst-on-the-Main, Germany, have invented certain new and useful Improvements in Reducing Indigo, of which the following is a specification.

We have found that the reduction of indigo may be practically carried out by means of the electric current and in the presence of warm sulfite solutions. In this process the sulfite or the hydrosulfite resulting therefrom serves as a carrier of the reducing action of the electric current—that is to say, the electric current does not directly reduce the indigo, but it reduces the sulfite to hydrosulfite, and the latter first reduces the indigo.

The process may be conducted in such a manner as to directly obtain a solid indigo-white product pretty stable even when exposed to the air by taking care that the liquid does not become too alkaline during the electrolysis; otherwise an indigo-white solution will be the result. It is best to operate without diaphragm, for instance, as follows: Three hundred grams of indigo-paste of twenty-per-cent. strength are electrolyzed at about three to five amperes per square decimeter without diaphragm while stirring at about 80° centigrade with four hundred and fifteen cubic centimeters of a sodium-sulfate solution of about thirty-per-cent. strength,

four hundred and fifteen cubic centimeters of a sodium-sulfite solution containing about ten per cent. of SO_2 , and fifty-five cubic centimeters of a sodium-bisulfite solution containing about forty per cent. of NaHSO_3 , the electrodes being of lead. After about twenty-four ampere hours the indigo is reduced, and the indigo-white resulting may be filtered and obtained free from the above-mentioned salts by washing it with hot water. The density of current and voltage may vary between wide limits.

Having now described our invention, what we claim is—

1. The herein-described process for reducing indigo, which consists in subjecting indigo in the presence of a sulfite solution to the action of the electric current, substantially as set forth.

2. The herein-described process for reducing indigo, which consists in subjecting indigo in the presence of a warm sulfite solution about 60° to 100° centigrade to the action of the electric current without diaphragm, substantially as set forth.

In testimony that we claim the foregoing as our invention we have signed our names in presence of two subscribing witnesses.

RUDOLF MÜLLER.
OTTO SCHWAB.

Witnesses:

ALFRED BRISBOIS,
HEINRICH HAHN.