[Second Edition.]

PATENT SPECIFICATION

Application Date : Sept. 12, 1927. No. 23,961 / 27.

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1538

PROVISIONAL SPECIFICATION.

Improvements in the Recovery of Volatile Organic Solvents.

I, JAMES YATE JOHNSON, a British subject, of 47, Lincoln's Inn Fields, in the County of London, Gentleman, do hereby declare the nature of this invention (which has been communicated to me from abroad by I. G. Farbenindustrie Aktiengesellschaft, of Frankfort-on-Main, Germany, a joint stock company organized under the laws of Germany) to be as follows:—

Volatile organic solvents are usually recovered by passing the gases, which contain the vapours of such solvents, over active charcoal or through sulphuric acid of suitable concentration, or by washing the gases with suitable organic liquids of high boiling point. For the most part, these processes are well adapted only for certain solvents, and are unsuitable, or imperfectly suitable, for others.

My foreign correspondents have now found that volatile organic solvents of very divergent kinds may be recovered, with a satisfactory yield, by employing as the medium for washing the gases containing the vapours of the solvents, the products with a boiling point above 200° Centigrade obtained by the catalytic hydrogenation of the oxides of carbon to methanol or other compounds containing oxygen.

Compared with the washing oils hitherto used, the said products offer a series of advantages. In the first place may be mentioned their well-marked and extensive solvent capacity for volatile organic substances of a great variety of kinds. They also have the advantage of not absorbing water, so that the gases to be freed from the volatile solvents may also be washed therewith without any preliminary drying. Owing to their low viscosity and low solidification point below – 60° Centigrade, the new washing oils may be used for operating at temperatures considerably below 0° Centigrade. Their low volatility enables the absorbed solvents to be recovered, without appreciable loss, by distillation preferably in vacuo.

The following example will further illustrate the nature of the said invention which however is not limited thereto.

EXAMPLE.

A current of air saturated with benzene at 20° Centigrade is treated with the fraction, boiling at above 200° Centigrade, of the products obtained by the catalytic hydrogenation of oxides of carbon, the treatment being carried out, on the counterflow principle, in a suitable absorption tower. At a working temperature of 20° Centigrade the washing oil absorbs up to 59 per cent. of its own weight of benzene.

Dated this 12th day of September, 1927.

JOHNSONS & WILLCOX,
47, Lincoln's Inn Fields, London, W.C. 2,
Agents.

COMPLETE SPECIFICATION.

Improvements in the Recovery of Volatile Organic Solvents.

I, JAMES YATE JOHNSON, a British subject, of 47, Lincoln's Inn Fields, in the County of London, Gentleman, do hereby declare the nature of this invention (which has been communicated to me from abroad by I. G. Farbenindustrie Aktiengesellschaft, of Frankfort-on-Main, Germany, a joint stock company organized under the laws of Germany), and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Volatile organic solvents such as are vaporised in many branches of the chemical industry for example in the production of lacquers, of artificial silk or in cleaning are usually recovered by passing the gases, which contain the vapours of such solvents, over active charcoal or through sulphuric acid of suitable concentration, or by washing the gases with suitable

[*Price* 1/-].

organic liquids of high boiling point such as cresol oil or tar oils. For the most part, these processes are well adapted only for certain solvents, and are unsuitable, or imperfectly suitable, for others.

My foreign correspondents have now found that volatile organic solvents of very divergent kinds may be recovered with a satisfactory yield, by employing as the medium for washing the gases containing the vapours of the solvents, the products with a boiling point above 200° Centigrade obtained as by-products in the catalytic hydrogenation of the oxides of carbon to methanol or other compounds containing oxygen of low boiling point. The said by-products consisting in a preponderating proportion of alcohols of a high molecular weight, together with a heterogeneous mixture of ketones, aldehydes, esters and other organic compounds of low boiling point containing oxygen of a not identified structure.

Compared with the washing oils hitherto used, the said products offer a series of advantages. In the first place may be mentioned their well-marked and extensive solvent capacity for volatile organic substances of a great variety of kinds. They also have the advantage of not absorbing water, so that the gases to be freed from the volatile solvents may also be washed therewith without any preliminary drying. Owing to their low viscosity and low solidification point below −60° Centigrade, the new washing oils may be used for operating at temperatures considerably below 0° Centigrade. Their low volatility enables the absorbed solvents to be recovered, without appreciable loss, by distillation preferably in vacuo.

The following example will further illustrate how the said invention may be carried out in practice but it is not limited thereto.

EXAMPLE.

A current of air saturated with benzene at 20° Centigrade is treated with the fraction, boiling above 200° Centigrade, of the by-products obtained by the catalytic hydrogenation of oxides of carbon, the treatment being carried out, on the counterflow principle, in a suitable absorption tower. At a working temperature of 20° Centigrade the washing oil absorbs up to 59 per cent. of its own weight of benzene.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A process for the recovery of volatile organic solvents from gases containing the same which consists in washing the said gases with products having a boiling point above 200° Centigrade obtained as by-products in the catalytic hydrogenation of oxides of carbon to methanol or other compounds containing oxygen and separating the mixture obtained by usual means.

2. The process for the recovery of volatile organic solvents from gases containing the same as described in the foregoing example.

3. Volatile organic solvents when recovered according to the processes of the foregoing claiming clauses.

Dated this 8th day of June, 1928.

JOHNSONS & WILLCOX,
47, Lincoln's Inn Fields, London, W.C. 2,
Agents.

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