

UNITED STATES PATENT OFFICE.

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NITRO COMPOUND.

SPECIFICATION forming part of Letters Patent No. 568,877, dated October 6, 1896.

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To all whom it may concern:

Be it known that we, WALTER FRANCIS REID, civil engineer, residing at Fieldside, Addlestone, Surrey, and EDWARD JOHN VAVASOUR EARLE, merchant, residing at 119 Cheapside, in the city of London, England, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Nitro Compounds, of which the following is a specification.

According to this invention we produce a nitro compound by the nitration of linolein or ricinolein, and also produce an improved nitro compound by the admixture of nitrated linolein or ricinolein with nitrocellulose.

Compounds of nitrocellulose, such as parke-sine, xylonite, celluloid, and the like, which are now used both for molding articles and as coatings or varnishes, are to some extent brittle. To prevent this brittleness and to obtain a product capable of more general use, we mix or incorporate the nitrated linolein or nitrated ricinolein with nitrocellulose. Camphor is the best known solvent of nitrocellulose and is most generally used. It is, however, volatile, and celluloid (as its mixture with nitrocellulose is commonly called) when exposed to heat therefore becomes brittle. It is also hard, and therefore soft india-rubber-like compounds cannot be made with it alone, but something, generally castor-oil, has had to be added; but castor-oil is not stable, and the product therefore deteriorates.

To be generally useful in the arts, the solvent of the nitrocellulose should have the following properties: first, it must neither exude nor cause brittleness in the product; second, it must be insoluble in water; third, it must not be explosive nor highly inflammable; fourth, it must not be volatile; fifth, it must be absolutely stable. Nitrolinolein and nitroricinolein perfectly fulfil these conditions.

In carrying out our invention we take oils mainly composed of linolein, such as linseed, poppy, or nut oils, or those containing a large proportion of ricinolein, such as castor-oil, and we nitrate them substantially in the same way as is customary in the nitration of other organic liquids, such as benzole or glycerin. For the nitration either concentrated nitric

acid may be used or a mixture of such acid with concentrated sulfuric acid in the usual proportions, or the nitro compound may be produced by passing continuously through the oil a current of nitrous-acid gas. The resulting nitro compounds are semiliquid and difficult to purify by washing in the usual way. We therefore incorporate them with the solid and finely-pulverized carbonates of the alkalies or alkaline earths, such, for example, as chalk, the proportion of such carbonates being slightly in excess of the amount required to neutralize the free acid remaining in the nitro compound. We remove the excess of carbonate by subsidence, first heating the nitro compound to about 200° Fahrenheit to render it sufficiently fluid, and the nitro compound is then ready for use.

We may mix either of the varieties of nitrocellulose with either or both of the nitro compounds prepared as described; but for most purposes we prefer the soluble variety of nitrocellulose. The proportion of nitrolinolein or nitroricinolein varies according to the consistency which it is desired to give to the finished material. Nine parts by weight of nitrocellulose mixed with one part by weight of nitrolinolein or nitroricinolein or both of them yield a substance resembling ebonite or vulcanite in its physical character, while one part by weight of nitrocellulose mixed with two parts by weight of either or both of the new nitro compounds gives a soft elastic substance of about the consistency of the mass of which printer's inking-rollers are composed. The mixing is carried out by malaxation at a temperature not exceeding that of boiling-water. Should the compound be required for a varnish or in solution, the ingredients may be added direct to the solvent without previous malaxation, as we have found that the usual solvents for nitrocellulose are also solvents for nitrolinolein and nitroricinolein. Small quantities of solvent may be added during malaxation to facilitate the combination of the nitro compounds. These new mixtures may be employed for the same purposes as the above-mentioned compounds of nitrocellulose now in use.

We claim—

1. The herein-described process which con-

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sists in nitrating linolein (or ricinolein), incorporating it with a solid and finely-pulverized carbonate of an alkali or alkaline earth, and then removing the excess of carbonate by subsidence.

2. The herein-described process of preparing nitro compounds which consists in subjecting linolein (or ricinolein) to the action of nitric acid, then incorporating with the nitrated linolein (or ricinolein) a solid and finely-pulverized carbonate of an alkali or alkaline earth, then heating the compound and removing the excess of carbonate.

3. The process herein described, which consists in nitrating linolein (or ricinolein) by subjecting it to the action of nitric acid, incorporating with the nitrated linolein (or ricinolein) a solid and finely-pulverized carbonate of an alkali, or alkaline earth, removing the excess of carbonate and then mixing the nitrated substance with nitrocellulose.

4. The process herein described, which consists in nitrating linolein (or ricinolein) by subjecting it to the action of nitric acid, incorporating with the nitrated linolein (or ricinolein) a solid and finely-pulverized carbonate of an alkali, or alkaline earth, mixing the nitrated linolein (or ricinolein) with nitrocellulose, and finally adding a solvent which dissolves both the nitrated substance and the nitrocellulose.

5. The herein-described compound consisting of nitrocellulose and a nitro compound resulting from the nitration of linolein (or ricinolein).

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Witnesses:

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