

# UNITED STATES PATENT OFFICE.

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## PROCESS OF EXTRACTING OIL.

SPECIFICATION forming part of Letters Patent No. 465,031, dated December 15, 1891.

Application filed June 29, 1889. Serial No. 316,057. (No specimens.)

*To all whom it may concern:*

Be it known that I, ERNEST GEORGE SCOTT, of Port Sunlight, near Birkenhead, in the county of Chester, England, have invented certain new and useful Improvements in the Process of Extracting Oils, of which the following is a specification.

Seeds and other materials have been deprived of their oil and grease by means of carbon bisulphide applied to dissolve out the oil. This is preferably done in a series of vessels, or what is commonly known in the art as "methodical treatment," the fresh carbon bisulphide in such case attacking the nearly-exhausted seed or other material and the nearly-saturated bisulphide being made to act last on nearly fresh seed or other material, the carbon bisulphide being afterward distilled from the grease. There are several disadvantages in this process which have prevented its general adoption. They are principally that the fumes of carbon bisulphide are very disagreeable and deleterious to the health of the workmen; second, that they are very inflammable, and, third, that they leave a very disagreeable odor or taste in the oil or grease obtained, making it useless for many purposes. Now I have discovered that by the substitution of carbon tetrachloride for carbon bisulphide very great advantages are attained, both in the course of manufacture and in the character of the product, the disagreeable and poisonous fumes being avoided, the danger of fire greatly reduced, and the product given a pleasant odor. The tetrachloride vapor is non-inflammable at the temperatures employed. Its boiling-point is low, so that great economy attends its use, while at the same time it is high enough to prevent or avoid material evaporation at ordinary temperatures. It is not liable to decomposition, it possesses remarkable powers of extraction, and it leaves no unpleasant odor in the material operated upon. The color of the oil or grease obtained by the use of tetrachloride is superior to that obtained by the use of bisulphide.

In making use of carbon tetrachloride I may employ the same apparatus, and the same steps that are now employed for the extraction of oil with carbon bisulphide, except that I substitute for the latter the tetrachloride. The old appa-

ratus and process are known in various slightly-modified forms to every practical chemist of the present day. One of the procedures in which the carbon tetrachloride may be employed is to provide a series of closed receivers to contain the seeds or other material to be treated. The tetrachloride will be passed through the receivers in succession, commencing with that containing the nearly-exhausted material and ending with that containing fresh material. Thus the more saturated tetrachloride will take up the oil from the freshest material and the fresh tetrachloride will take up the oil from the nearly-exhausted material. When the material in one receiver is exhausted, it is cut off from the rest and a fresh receiver connected to the end of the series. The receiver which is cut off has steam passed through it to blow out the fluid contents, after which the saturated tetrachloride of carbon is distilled off, leaving the oil behind. The material from which the oil is to be extracted is sustained in a receiver upon a false bottom and the tetrachloride placed in the bottom with a heating appliance, usually a steam-coil. The coil vaporizes the tetrachloride, which rises through the material and extracts the oil, which percolates down with the tetrachloride into the space below the false bottom. The base being hotter than any other part, the tetrachloride is again vaporized, leaving the oil behind. This goes on repeatedly and continuously until the greater part of the oil is extracted. The apparatus is then permitted to cool and the tetrachloride and oil delivered into a vessel, where they are separated.

The employment of tetrachloride carbon as a solvent in my process is not only advantageous as compared with bisulphide of carbon; but also as compared with any other solvent known at the present day—such, for example, as chloride of methyl or chloroform.

Chloride of methyl is a gas under ordinary circumstances and can be used only under pressure, so that its use would demand a totally different apparatus and be commercially impractical in the methodical process. Where, too, a gas like chloride of methyl is used under pressure, the risk of loss is infinitely greater than when a comparatively



stable liquid is used. Moreover, the risk of accident is tremendous and the breakage of a pipe or other cause of leakage would be attended with fatal results to workmen in the vicinity.

5 Chloroform is absolutely useless for the practical or commercial extraction of oil. Its boiling-point is 62° centigrade, far below that of tetrachloride of carbon. This is an exceedingly important difference, as the greater the specific gravity or density of the solvent the more marked is the difference between it and the specific gravity of the solution of oil therein. Consequently with the tetrachloride 10 there is far greater tendency for the solvent as it becomes saturated with the oil to rise to the top. The result is that with chloroform it is practically impossible, even with the methodical process, to get a thoroughly-saturated solution, except by very long contacts 20 and a great number of chambers, while with tetrachloride of carbon, owing to its specific gravity, the solution rises to the top, so that by the use of one or two chambers a saturated 25 solution may be obtained. Thus a great reduction in the size and cost of the plant is permitted with a corresponding cost in the cost of maintenance and in leakage.

30 Again, chloroform being very volatile as compared with the tetrachloride, there is much less waste in using the latter. Moreover, the use of chloroform is attended with very great

danger by reason of the anæsthetic vapors given off, whereas the vapor of tetrachloride at ordinary temperatures will not act anæsthetically except under long and continuous exposure thereto. It will be observed, therefore, that the employment of tetrachloride is highly advantageous not only as regards economy of manufacture and safety to the attendants, but also as to the quality of the product. 35 40

Having thus described my invention, what I claim is—

1. As an improvement in the art of extracting oil or grease from seeds or other substances, digesting the said materials with carbon tetrachloride until the oil or grease is extracted, and then separating the carbon tetrachloride from the oil or grease by distillation. 45 50

2. As an improvement in the art of extracting oil or grease from seeds or other substances, exposing the said substances to the vapor of carbon tetrachloride, allowing the mixed hot oil and tetrachloride to drain off, and finally separating them by distillation. 55

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ERNEST G. SCOTT.

Witnesses:

JOSEPH J. ROYDER,  
H. P. SHOBRIDGE.