

UNITED STATES PATENT OFFICE.

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PREPARATORY TREATMENT OF COTTONSEED AND PRODUCT THEREOF.

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The present invention relates to an improved pretreatment of cotton seed prior to the process of obtaining oil therefrom by extraction, and to the solid product of said pretreatment.

The working of cotton-seed in order to obtain oil therefrom involves considerable difficulties which result for the most part from a greenish black dye-stuff or colouring-matter which is contained in the form of small dots in the resinous glandules or globules existing within the seed-kernel. The quantity of this colouring-matter increases during storage of the seed. Up to the present time, therefore, a really first grade cotton-seed oil, adapted for food purposes, has been produced from the seed only in those countries where the seed can be worked in a fresh state, for example in North America. But when the oil is separated by pressing after the seed has travelled a long distance or after the seed has stood a long time (e. g. several months) the oil obtained can only be used for technical purposes. Even the application of any of the well known bleaching processes does not succeed in obtaining a bright oil that may be used in the manufacture of artificial butter (margarine) and fat for food.

Hitherto the obtaining of high grade oil from cotton-seed has been restricted exclusively to the separation by pressure. Attempts to extract the oil by suitable solvents, failed as by so doing the dye-stuff or colouring-matter was dissolved at the same time, the oil thereby took on a deep black red-brown coloration and could not be brightened again by any known method.

The subject-matter of the present invention is an improved method of pretreating cotton-seed to render it suitable for the extraction of oil by oil solvents. The novel process applies with like good results to fresh as well as to old seed. The oil obtained corresponds at all times to the best press-oil obtained from fresh seed. The invention embraces also the solid product of such pretreatment, as described herein.

The novel process depends on subjecting the cotton-seed to a preparatory treatment with diluted alcohol (ethyl alcohol in its commercial form being suitable) before the real extraction of the oil by means of a suitable oil solvent. The alcohol takes up

the main quantity of the existing free fatty acid and of the dye-stuff or colouring-matter, but only small quantities of the neutral oil glyceride. This solution is then separated from the seed. The oil obtained by subsequent extraction by a fat-solvent, has a light-brown coloration, similar to that of the press-oil. The small quantity of free fatty acid still existing in the oil may be removed by means of alkali (e. g. in the well known way). At the same time also the last traces of the dye-stuff or colouring-matter are precipitated, and there results a beautiful yellow oil which can be bleached by a small quantity of bleaching earth (e. g. fuller's earth or the like).

The novel process affords the further advantage that the poisonous matters which otherwise remain in the press-cakes, are likewise removed, the said poisonous matters resulting probably from the colouring resins. The precautions which otherwise must be taken in using up cotton-seed meal as fodder for cattle, can therefore be neglected when using up cotton-seed meal treated as stated above.

For carrying the novel process into practice the decorticated cotton-seed for example, is bruised and then treated in the cold (i. e. at ordinary atmospheric temperature) with ethyl alcohol of 80 vol. percent. The dark coloured extract, which contains the major part of the free fatty acid and of the resins, as well as immaterial quantities of neutral oil, is separated and the bruised seed (groats) freed from alcohol. The said seed is then lixiviated with benzol or benzine or any other suitable fat-solvent. The oil thus obtained contains about one percent free fatty acid. For removing this acid and the small amount of contained dye-stuff, the oil is mixed with a solution of caustic soda. For bleaching the oil a small quantity of bleaching earth, for example one percent of high grade fuller's earth, will suffice.

Without restricting myself to details, I give the following example of the process.

Cotton seed (fresh or old), decorticated and bruised by well known methods, is first treated at room temperature, with say 4 to 6 times its own weight of ethyl alcohol of about 60% to 80% strength (by volume) and allowed to stand in contact therewith for say 5-10 hours, while agitating if desired.

Well known percolation methods could also be used if desired. The alcohol of course carrying the dissolved matter is then drawn off. This step can be repeated if desired, and if the seed is very old it may be subjected to several (say 3-6) of such alcohol treatments. The seed left may be heated somewhat, (in a current of air or neutral gas or in a vacuum, if desired) to remove the adhering alcohol, but this step is to some extent optional. This dilute alcohol treatment removes the coloring materials but not any substantial fraction of the oil. The seed is then treated in the well known manner in the art of extraction, with one or more charges of benzol or benzine used in amount sufficient to extract the oil, the extract being of course drawn off from the treated seed. The solvent can be driven off from the solution by heat (i. e. distillation) in well known way. In the leaching of the oil from the seed, with a fat solvent such as benzol or benzine, the seed can if desired, be placed in a device like a percolator and the fat solvent can be allowed to run slowly through the charge of seed until substantially all of the oil has been extracted. The fat solvent can be supplied to the cotton seed material at atmospheric temperature, or at higher temperatures. The well known "systematic extraction" process can likewise be employed. The cotton seed material can be treated with enough oil solvent to remove all or most all of the oil. In all the amount of oil solvent may be 5 to 10 times the weight of the seed, more or less. The oil can then be purified, de-acidified and bleached by the usual methods well known in the art of refining cotton seed oil or other vegetable oils.

I claim:

1. A process of preparing cotton seed meats for the extraction of oil which comprises subjecting the cotton seed meats to the extraction action of somewhat dilute ethyl alcohol of around 80% strength, until the bulk of the coloring matter is removed without removing any large fraction of the cotton seed oil.

2. In the pretreatment of solid cotton seed material prior to extracting oil therefrom, the herein described step of leaching the same with ethyl alcohol of about 80% strength capable of removing the coloring matter soluble therein.

3. In the process of obtaining oil from cotton seed, the step which comprises first leaching the meats of cotton seed with alcohol of about 80% strength capable of extracting the soluble coloring matter, but not the oil.

4. In the pretreatment of solid cotton seed material prior to extracting oil therefrom, the herein described step of leaching the same with dilute alcohol.

5. In the pretreatment of solid cotton seed material prior to extracting oil therefrom, the herein described step of leaching the same with ethyl alcohol of about 80% strength.

6. In the pretreatment of solid cotton seed material prior to extracting oil therefrom, the herein described step of leaching the same with dilute alcohol and continuing such treatment until the major part at least of the coloring matter soluble in such dilute alcohol has been removed from said cotton seed material.

7. In the pretreatment of solid cotton seed material prior to extracting oil therefrom, the herein described step of leaching the same, while in a decorticated state, with dilute alcohol.

8. In the pretreatment of solid cotton seed material prior to extracting oil therefrom, the herein described step of leaching the same, while in the cold, with dilute alcohol.

9. As a new product, cotton seed meat freed from the major part at least of such substances normally present in old cotton seed, as are soluble in dilute ethyl alcohol of about 80% strength, but still containing the bulk of its natural oil content.

In testimony whereof I affix my signature.

HERMANN BOLLMANN.