

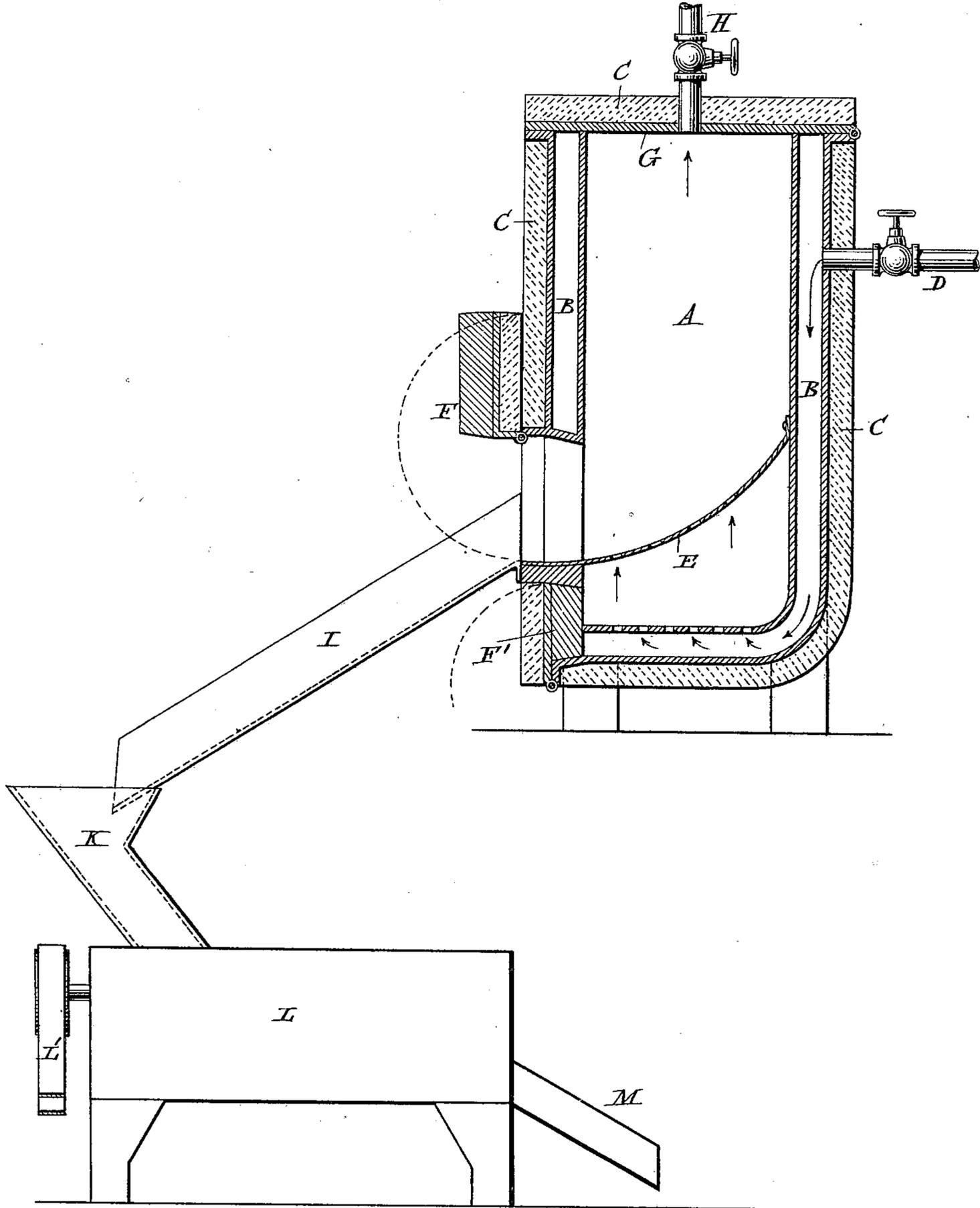
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R. H. HUTCHINSON.  
PROCESS OF EXTRACTING OILS.

(Application filed June 7, 1899.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## PROCESS OF EXTRACTING OILS.

SPECIFICATION forming part of Letters Patent No. 637,465, dated November 21, 1899.

Application filed June 7, 1899. Serial No. 719,699. (No specimens.)

*To all whom it may concern:*

Be it known that I, ROBERT H. HUTCHINSON, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Processes of Treating Animal and Vegetable Matter for the Extraction of Oils Therefrom, of which the following is a specification.

This invention is applicable to the treatment of garbage and carcasses of animals, as well as to the treatment of seeds and other vegetable growths, for the extraction of oils therefrom. By means of it I am enabled to secure a more perfect separation of the oil or grease from the other materials in which it is contained or with which it is combined and to at the same time do away with the offensive odors that usually accompany the practice of the various processes now in general use.

I first subject the matter to be treated to a very low temperature and to such low temperature that it is so frozen as to be brittle and friable and readily reduced, by percussion, as in a stamping-mill, or by grinding in a grinding-mill, to a comminuted, granulated, or pulverized form. Incidentally this treatment checks the emanation of all disagreeable odors or gases from the material. The required low temperature to produce the suggested condition of the material may be efficiently produced by the use of liquid air, either by immersion therein or by placing the material in a holder whose walls are refrigerated by the liquid air, or the liquid air may be sprayed upon the material, or any other suitable mode may be adopted of reducing the material to the required low temperature. When the material has been so frozen as to be brittle and friable, it is reduced, in the manner suggested or otherwise, into comminuted, granulated, or pulverized form, in which it is subjected to any suitable treatment for extracting the oils or fatty matters therefrom.

In the finely-divided state which it is in it may be treated by the ordinary boiling or steaming process or may be subjected to the action of a solvent of the oils or greases—such as kerosene, naphtha, or other suitable product of petroleum or any other suitable solvent—the separation of the extracted oils or greases and the solvent being subsequently

effected in any of the ways well known to those skilled in the art. When using a solvent, the finely-divided material may be placed in a tank with the solvent and stirred, if desirable, and then allowed to settle, or instead of allowing it to settle the slush composed of the material being treated and the solvent may be pumped into an ordinary filter-press, or the finely-divided material at such low temperature, and therefore in a relatively dry state, may be placed in porous bags and thus inclosed be placed by any of the ordinary boiling or steaming processes or subjected to the action of a solvent, after which the bags of material may be subjected to pressure to extract any remaining solvent or watery matter. Because of the finely-divided condition of the material I am enabled to secure a more perfect extraction or elimination therefrom of the oils or greases which it contains. In treating garbage which may contain pieces of tin or iron the low temperature to which these metals are reduced renders them also very brittle, and they therefore also become granulated or finely divided when subjected to percussion or a grinding operation. Their presence is not, therefore, an obstacle to the carrying out of my improved process according to either of the modes suggested or any suitable mode of extracting the oils and fats that may be adopted. The granulated or comminuted material at the low temperature to which it has been reduced may be placed in porous bags and in this way economically transported to some other point, where the oils and fats may be extracted therefrom.

Fish may be treated in the way I have described, and where carcasses of large animals are to be treated they may be first cut up into sections or be first frozen and then broken up.

Of course for the efficient separation of the oils and fats from the finely-divided material its temperature should be increased, and it may be allowed to rise to the normal temperature of the atmosphere, or thereabout, before being subjected to the action of the solvent. I have not above attempted to describe the many ways well known by which soluble components of matter of various kinds may be eliminated. I may, however, refer to one additional well-known method to which the

finely-divided material which I purpose treating may be subjected. It may be placed either in porous bags or in loose state in a closed vessel and a partial vacuum created therein. A suitable solvent—as, for instance, naphtha or gasolene—may be introduced under proper pressure at the bottom of the tank. The solvent will then percolate through the material, taking up the soluble oils and fats, and can be discharged at the top of the tank.

The frozen material in a pulverized form may be preserved in or allowed to remain in a frozen condition for storage or for transportation or until it is to be treated by some extraction process. Where the grease, oils, or other matter to be recovered or extracted from the material are eliminated therefrom by the use of a solvent, the immersion of the material in the solvent or the passage of the solvent therethrough would cause its continuing rise in temperature. Where a boiling or steaming process is used, the action of the process is such as to produce a marked rise in temperature of the material. The pulverized material may also be placed in suitable holders and allowed to rise to the temperature of the atmosphere and be subsequently treated by any suitable process for the extraction of the desired constituents therefrom. I do not limit myself to any method or process of extraction, nor do I recite any such process as of itself an essential of the invention herein claimed.

Regarding the temperature to which the material should be reduced, it is not feasible to name any given temperature that would be applicable to all classes of material, nor any certain temperature to which any particular material should be reduced. When the particular material under treatment has been so reduced in temperature that it is brittle and may be properly pulverized, a further reduction of temperature is obviously unnecessary. The material being frozen or reduced in temperature may readily be tested with a hammer to determine whether it has reached such a low temperature as to be readily broken up into small pieces or pulverized. Many materials will be in a suitable condition for this purpose at a temperature of, say, 50° Fahrenheit below zero. Others may require a lower temperature. In my judgment ordinary garbage at a temperature as low as 75° Fahrenheit below zero is in a suitable condition to be pulverized. I do not, however, limit myself to such temperature, as with some materials or some classes of garbage the temperature may be higher, and obviously it may be as much lower as in the operation of this method it seems desirable to carry it, and in any particular case the material may be tested, as above stated or otherwise, to ascertain whether it is in proper condition.

While I have above referred particularly to the extraction of oils and grease from vegetable and animal matter, it is obvious that the invention is applicable to any material

from which any constituent is to be extracted and also to the reduction of any material to a pulverized form for subsequent treatment by any process in which the finely-divided or pulverized form of the material is desirable.

The accompanying drawing illustrates so much of one form of apparatus that may be used as is desirable to disclose the mode of operation herein described. The drawing shows a vertical section of a freezing apparatus and an elevation of a pulverizing apparatus, the two being connected by a chute or trough by which the frozen material is directed to the pulverizing apparatus.

A is a vertical vessel having double walls, with a space B between them. The outer wall is protected by insulating material C. An entrance-pipe D, provided with a suitable valve or cock, communicates with this space, and the bottom of the inner member of the vessel is perforated. Above the perforated bottom is a curved or inclined false bottom E, at the level of which a door F is provided. Below the door F is another door F', communicating with the interior of the chamber above and below the false bottom E. The top is closed by a cover G, having an outlet-pipe H therein, with a suitable cock or valve. The material to be treated, first broken, cut up, or ground up to a suitable extent, so as to be in a convenient condition for handling and freezing, is introduced at the top, and all the doors being closed the cold vapors boiled off from liquid air or any other fluid refrigerating medium are introduced through the pipe D. They circulate in the space B and passing up through the perforated bottom and the perforated false bottom pass through the material in the vessel and out through the pipe H. In case liquid air is used the pipe H may be the only outlet or means of escape for the vapors boiled off from the liquid air, and of course in that event it should be of such capacity as to prevent an undesirable high pressure in the space B and the interior of the vessel. When the material has been frozen or reduced in temperature to the desired degree, the door F may be swung open and the material raked out into the trough I, through which it passes to the hopper K of a stamp-mill or grinding-mill L of any ordinary or suitable construction, and which in the drawing is shown as supplied with power by a belt L', running over a pulley. The finely-divided or pulverized material leaves the pulverizer by a spout or chute M and may be delivered into bags or any other receptacle for storage or for transportation or for delivery to the apparatus by which it is to be treated. Such apparatus forms no part of the invention, and illustration of any of the well-known apparatus for the extraction of oils and grease from garbage or other material would only unnecessarily encumber the drawing.

I claim as my invention—

1. The herein-described process of extracting oils or fats from animal and vegetable

matter which consists in first reducing the material to such low temperature that it becomes brittle or friable, then reducing it to a finely-divided condition and then extracting the oils and greases therefrom.

2. The herein-described process of extracting oils and fats from animal and vegetable matter which consists in first reducing the material to such low temperature that it becomes brittle or friable, then reducing it to a finely-divided condition, then inclosing it in porous holders or bags and then extracting the oils and greases therefrom.

3. The herein-described process of extracting the oils and fats from animal and vegetable matter which consists in first reducing the material to such low temperature that it becomes brittle or friable, then reducing it to a finely-divided condition, then inclosing it in porous holders or bags, then subjecting the material contained in the porous bags to the action of a solvent of the oils or greases and then subjecting the bags to pressure to eliminate the fluid matter therefrom.

4. The herein-described process of reducing animal or vegetable matter to a finely-divided condition which consists in first re-

ducing the material to such low temperature that it becomes brittle or friable, then reducing it to a comminuted, granulated or pulverized form, and then inclosing it in porous bags for subsequent treatment for the extraction of the oils and greases therefrom.

5. The herein-described process of extracting constituents from animal and vegetable material which consists in first reducing the material to a low temperature at which it is brittle or friable, then pulverizing it and then subjecting it to a process or means for the extraction of the desired constituents therefrom.

6. The herein-described process of reducing animal or vegetable matter to a finely-divided condition which consists in first reducing the material to a low temperature at which it is brittle and then pulverizing it by the action of a suitable pulverizing apparatus.

In testimony whereof I have hereunto subscribed my name.

ROBERT H. HUTCHINSON.

Witnesses:

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