

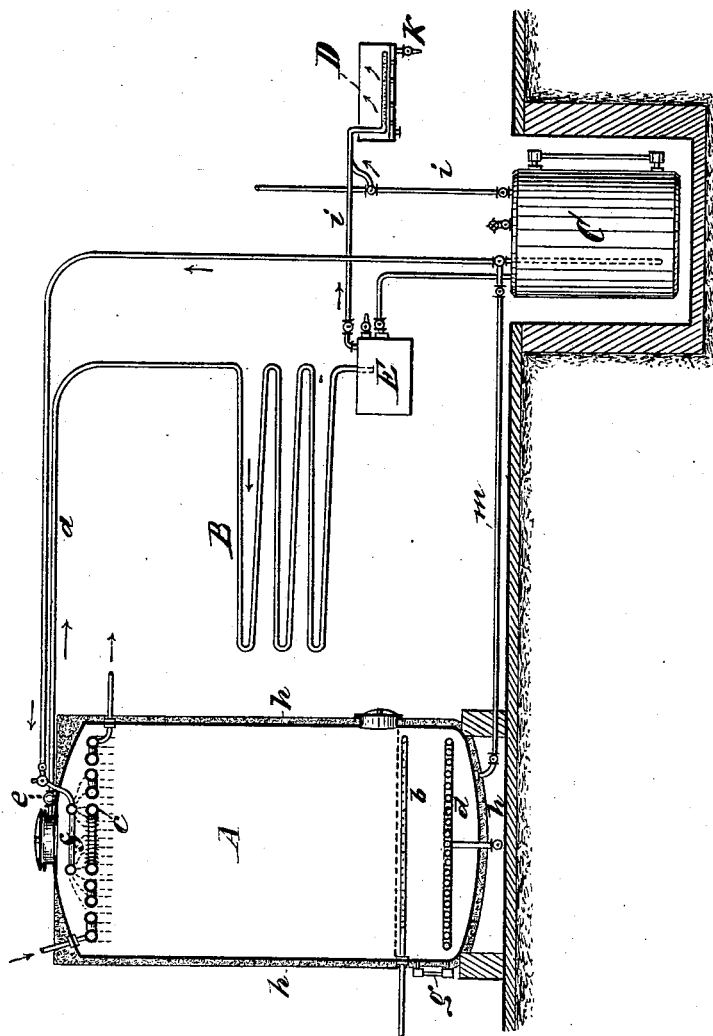
(No Model.)

W. SCHNEIDER.

METHOD OF AND APPARATUS FOR EXTRACTING FAT FROM BONES.

No. 261,259.

Patented July 18, 1882.



WITNESSES:

Carl Karp

Otto Risch

INVENTOR

Werner Schneider

BY

Paul Grope

ATTORNEY

UNITED STATES PATENT OFFICE.

WERNER SCHNEIDER, OF LEHRBERG, BAVARIA, GERMANY.

METHOD OF AND APPARATUS FOR EXTRACTING FAT FROM BONES.

SPECIFICATION forming part of Letters Patent No. 261,259, dated July 18, 1882.

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To all whom it may concern:

Be it known that I, WERNER SCHNEIDER, of Lehrberg, in the Kingdom of Bavaria, in the Empire of Germany, have invented certain new and useful Improvements in Methods of and Apparatus for Extracting Fat from Bones, of which the following is a specification.

It is well known that sulphide of carbon, benzine, and other volatile solvents can be separated by distillation from fats in such a manner that the vapors of these volatile solvents do not absorb and carry off any fatty particles. Consequently it must be the aim of a profitable extraction of fats to bring the sulphide of carbon or benzine in liquid or finely-divided form into contact with the substances to be extracted, and then evaporate the solvents from the fat.

The object of this invention is to extract the fatty matter from bones and other substances by means of volatile solvents.

The accompanying drawing represents a vertical longitudinal section of an apparatus for extracting fatty matter from bones by my improved process.

A in the drawing represents the extraction-vessel, which is covered by a jacket of a suitable non-conducting material, so as to prevent any loss of heat by radiation. The extraction-vessel A is hermetically closed after the same has been filled with bones or other substances from which the fat is to be extracted. The vessel A is provided at the lower part with a steam-coil, *d*, and above the same with a steam-spray coil, *b*. At the top part of the extraction-vessel A is arranged a supply spray-pipe, *f*, through which benzine or other volatile solvents are supplied to the interior of the vessel A. After the latter is filled with the bones about four-fifths of the benzine is forced from the benzine-reservoir C through pipe *m* into the vessel A, and the pipe *m* then closed. The contents of the extraction-vessel A are then heated up by the steam-coil *d*. As soon as the benzine begins to be distilled off through exit-pipe *a* the valve *e* of the same is closed. When a certain degree of pressure is obtained in the extraction-vessel A the remaining quantity of benzine is forced into the same through the spray-pipe *f*, and thus compelled to distribute itself in a uniformly-divided spray over the

bones. In this manner the cold benzine is forced through the bones from the top to the lower part of the extraction-vessel, where it mingles with the hot ascending vapors of benzine, by which it is gradually heated up. By properly regulating the supply-valves of the pipes connecting the extraction-vessel A with the benzine-reservoir C it is not only possible to maintain a uniform current of benzine over the bones, but also keep the pressure in the extraction-vessel at any desired height. As the bones are continually washed or elutriated by new quantities of benzine, which is free of fatty matters, a perfect extraction of the fat from the bones is gradually obtained. A similar result can be obtained if a cooling-coil, *c*, is arranged below the supply spray-pipe *f* in the upper part of the extraction-vessel A. In this coil cold water is made to circulate. The rising benzine vapors are condensed on the coil *c*, and, dripping from the ribs exteriorly, distributed in a uniform manner over the bones. With this arrangement it is also possible to obtain a steady current of benzine at any desired pressure. Either one or both modes of forming the benzine current may be used in one and the same apparatus, and thereby a more effective extraction of the fat from the bones obtained. The whole process can be completed in from two to four hours, and can be controlled from beginning to end. As soon as the fatty matter is elutriated from the bones the stop-cocks of the coils *f* and *c* are closed, the valve *e* is opened, and the benzine then distilled off through the condenser B to the intermediate collecting-vessel, E, and thence into the benzine-reservoir C.

The condition of the fat in the extraction-vessel A is readily observed by the gage *g*, arranged at the bottom part of the same. As soon as the extracted fat begins to thicken it rises, but it is forced down by the steam-spray supplied by the coil *b*. As soon as the benzine is distilled over the fat is removed from the extraction-vessel.

In starting the apparatus, as well as during the distilling off of the benzine, air and gases are carried along, which, even with the most perfect cooling, contain some vapors of benzine, which would thereby be lost. For the purpose of regaining the greater part of the benzine vapors

a benzine-absorber, D, is connected by pipes *i* with the collecting-vessel E and reservoir C. The absorber D consists of an open vessel having a double bottom, K, in which cold water is made to circulate. The air which carries the benzine vapors is conducted through the pipes *i* into the absorbing-vessel D. This is filled partly with a portion of fat from the extraction-vessel A. This fat retains the small quantity of benzine vapors carried along, and is returned into the extraction-vessel A for the next extracting operation.

The herein-described method has the following advantages: an almost perfect extraction of the fat from the bones and other substances, so that about one and a half to two per cent. more fat is obtained than with the methods heretofore used; secondly, a considerable saving in steam; thirdly, a considerable shorter time is required for the extraction of the fat; fourthly, as the operation takes place at a comparatively low pressure it is possible to produce in the extraction-vessel a glue of light color; and, lastly, a very small loss of benzine occurs, owing to the absorption of the escaping benzine vapors.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of a vessel for extracting fat from bones, provided with a steam-heating coil near the bottom, a spray-coil near the top, a reservoir for the volatile solvent, a pipe provided with a stop-cock connecting the reservoir with said vessel, a pipe provided with a stop-cock connecting said reservoir with the said spray-coil, an intermediate collecting-chamber,

and pipes connecting said collecting-chamber with the reservoir and vessel, substantially as described.

2. The combination of a vessel for extracting fat from bones, provided with a steam-heating coil near the bottom and a spray-coil near the top, a reservoir for the volatile solvent, a pipe provided with a stop-cock connecting the reservoir with said vessel, a pipe provided with a stop-cock connecting said reservoir with said spray-coil, an intermediate collecting-chamber, pipes connecting the collecting-chamber with the reservoir, an absorbing-tank, and pipes connecting the absorbing-tank with the collecting-chamber and reservoir, substantially as described.

3. The process herein described of extracting fat from bones, consisting of inclosing the bones and a volatile solvent in a vessel, then subjecting them to the action of heat under pressure of the heated solvent, then simultaneously allowing the escape of vapor to an adjacent vessel and the admission of a fresh supply of the solvent to the main vessel in the form of spray, whereby all the fat is extracted from the bones without interruption of the process.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 4th day of February, 1882.

WERNER SCHNEIDER.

Witnesses:

FR. FAKLENSTORFER,
ALFRED MUSSINAN.