

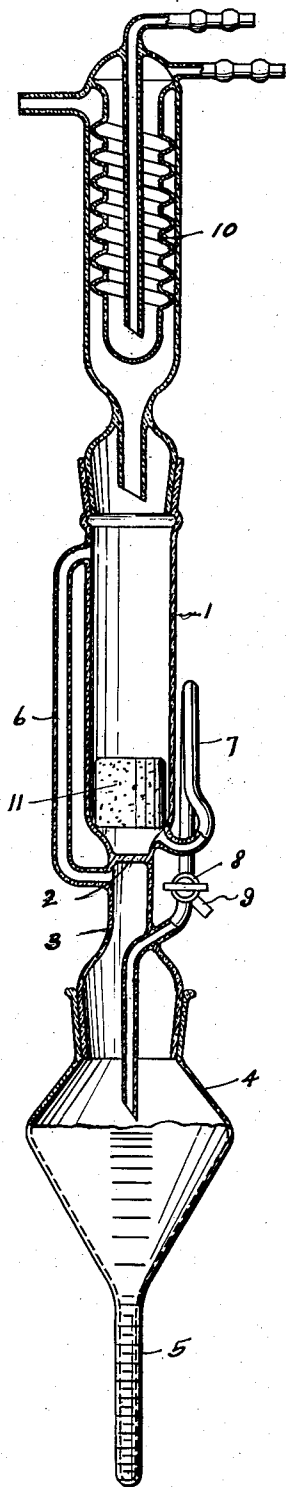
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APPARATUS FOR EVALUATING OIL SANDS

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APPARATUS FOR EVALUATING OIL SANDS

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1 Claim. (Cl. 23—259)

This invention relates to apparatus specially designed for the purpose of evaluating oil sands.

The invention has been particularly designed for the purpose of determining the oil content of a sample of earth formation.

By the use of the invention the oil content of other substances than oil sand, that is, such as cotton seed meal, cake or hulls may be determined.

The invention embodies certain improvements over conventional extraction apparatus in that it embodies a novel type of seals between the separable parts of the apparatus as well as a graduated collection tube and a discharge outlet pipe leading from the siphon pipe of the extraction apparatus with a common valve for controlling the siphon pipe and the outlet pipe whereby the liquid may be returned from the extraction tube into the flask or discharged from the apparatus.

With the above and other objects in view, the invention has particular relation to certain novel features of construction, operation and arrangement of parts and to the novel processes, examples of which will be given in the specification and illustrated in the accompanying drawing, wherein:

The figure shows a vertical sectional view of the apparatus.

Referring now more particularly to the drawing, the numeral 1 designates an extraction tube whose lower end is closed by the transverse partition 2. In as much as the sample is to be later placed in the pycnometer, the inside diameter of the tube should be approximately the same as that of the pycnometer. Depending from the tube 1 there is a tubular neck 3 whose lower end is enlarged to receive the upper end of the flask 4. The lower end of the flask terminates in a graduated collecting tube 5. A return vapor conduit 6 is connected into the neck 3 beneath the partition 2 and leads up into the upper portion of the extraction tube 1. A siphon pipe 7 leads out from the lower end of the extraction tube above the partition 2 and is turned inwardly through the wall of the neck 3 and its lower end terminates in the flask 4. This siphon pipe is controlled by the three-way valve 8 whereby the siphon pipe 7 may be closed or may be opened to permit liquid to flow therethrough into the flask or may be turned to a third position to connect the siphon pipe 7 to the discharge outlet pipe 9.

The upper end of the extraction tube is preferably flared forming a seat to receive the lower

end of any conventional type of condenser 10 to be mounted thereon.

In carrying out the process of determining the oil content of a core or sample, the extractor is assembled as shown in Figure 1 but without the condenser 10 mounted thereon. The sample 11 is then placed in the extraction tube 1. A suitable solvent is then poured over the sample and allowed to siphon into the flask 4. A preferred solvent found to be most advantageous is a pure hydrocarbon fraction having a boiling point of from 82 to 100° F. and having the desired solvent properties. The process of pouring the solvent over the sample is repeated until the major portion of the oil content is removed by this cold percolation method. The condenser is then installed in position as shown in Figure 1 and a cool liquid such as water, is circulated through it. The vapors arising from the solvent will pass up through the conduit 6 and will be condensed by the condenser and will drop back over the sample. The solvent is boiled from the flask 4, by the application of heat in any conventional manner, preferably by a specially formed electrical heater.

At the conclusion of the extraction the valve 8 is turned to position to allow the solvent to siphon off into a suitable container through the drain pipe 9 so that the solvent may be again used. A small amount of solvent is lost with each extraction however, and new solvent should be added to make up the volume necessary for a complete removal of all the oil. As above indicated, the solvent will be boiled from the graduated flask leaving only the oil in the tube 5 of said flask and the quantity of oil may be thus readily ascertained, the reading being direct from said tube.

After the extraction is completed, the sample 11 is dried in a suitable heater in order to remove all traces of solvent as well as the moisture from said sample.

The apparatus employed will enable an oil producer to determine the percentage of oil by volume contained in the structure.

What I claim is:

Apparatus for determining the volume of oil in a sample containing oil which comprises an extraction tube whose upper end is formed with a tapering seat, a condenser above the tube whose lower end is provided with a tapering seat, said seats telescoping and forming a fluid tight joint, a flask beneath the tube whose lower end terminates in a graduated collecting tube, said extraction tube and flask having tapering seats

which telescope to form a fluid tight joint, a return conduit leading from the flask into the extraction tube, a siphon pipe leading from the lower portion of the extraction tube and terminating in the flask, a discharge outlet pipe leading from the siphon pipe, a common valve

for controlling the siphon pipe and the outlet pipe whereby liquid may be returned from the extraction tube into the flask or discharged from the apparatus.

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