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SEPARATORY APPARATUS.
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984,923.

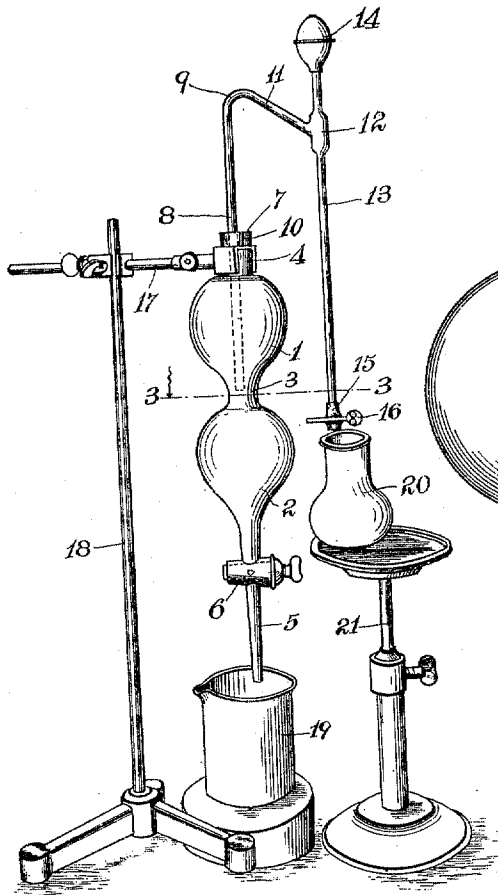


Fig. 1.

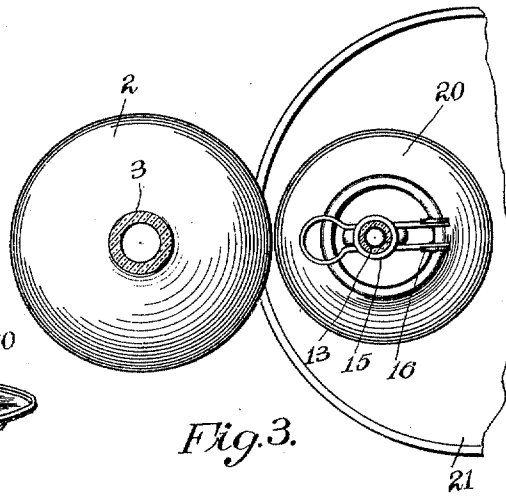


Fig. 3.

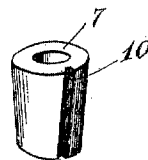


Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

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To all whom it may concern:

Be it known that we, CARL A. JACOBSON and SANFORD C. DINSMORE, citizens of the United States, residing at Reno, in the county of Washoe and State of Nevada, have invented new and useful Improvements in Separatory Apparatus, of which the following of a specification.

This invention relates to separatory apparatus of that kind particularly designed for separating liquids of different specific gravities, the object of the invention being to provide a separatory apparatus in which provision is made for the ready and convenient siphoning off and separation of one of the liquids from the other.

A further object of the invention is to provide an apparatus of this kind in which a two-part funnel is provided having its parts in communication through a restricted passage, whereby the solvent and solution in the operation of extraction may be brought into intimate contact to secure a more rapid and thorough extraction, such construction of the funnel further facilitating separation of a liquid of one specific gravity from one or more liquids of different specific gravities.

A still further object is to provide simple and effective means whereby the necessity of using an ordinary pipette in the operation of extraction, and the disadvantages and inconveniences resulting therefrom, are obviated, and whereby the discharge of the siphoned liquid may be controlled so that it may be filtered during the siphoning operation.

The invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawing, in which:—

Figure 1 is a perspective view showing the apparatus as arranged for use. Fig. 2 is a detail view of the stopper. Fig. 3 is a detail section on the line 3—3 of Fig. 1.

The apparatus embodies a double funnel consisting essentially of an upper bulb 1 and a lower bulb 2, said bulbs being connected by a constricted neck or passage 3. The upper bulb is provided with a mouth 4 which may be closed when the apparatus is not in use by an ordinary ground glass stopper, while the lower bulb is provided with a discharge spout 5 in which is arranged a glass stop cock 6.

In the use of the device, a stopper 7 of cork or other suitable material is fitted

within the mouth 4 and is provided with a central opening for the passage of the vertical leg 8 of a siphon tube 9, which extends down through the bulb 1 into the upper portion of the constricted neck 3. The stopper 7 is provided in its side with a groove or channel 10 for the admission of air to equalize the internal pressure when the liquid is being siphoned from the bulb 1. The leg 8 is preferably made of heavy walled capillary glass tubing joined at the bend of the siphon tube to the shorter leg 11, of said tube, which is made of thinner glass, the leg 8 thus forming a firm and strong support for the siphon. The leg 11 of the siphon tube extends outwardly and downwardly at a suitable angle and communicates with the bulb 12 of a pipette or suction tube 13, which is provided at its upper end with an aspirator, shown in the present instance as an ordinary rubber bulb 14. The lower end of the suction tube 13 has fitted thereon a discharge nipple or nozzle 15, preferably consisting of a short section of rubber tubing, projecting below the suction tube so that it may be engaged by the jaws of a spring clip or clamp 16, whereby the tube may be closed against the inlet of air and the discharge of liquid.

In practice, the apparatus may be supported for use as shown in Fig. 1, in which the mouth 4 of the funnel is connected with a suitable holder on a horizontal arm 17 adjustably mounted upon the supporting standard 18, the discharge tube 5 being arranged to discharge into a suitable receptacle 19, while the suction tube 13 has its lower end disposed above a receiver 20 mounted upon a standard 21.

The apparatus may be employed for extracting substances from solutions of different kinds through the employment of a proper solvent. A thorough and rapid extraction is insured by the form of funnel described in which the bulbs and chambers 1 and 2 are separated by the constricted neck 3, in that the solvent and solution must pass each other in a narrow space when the funnel is inverted, thus bringing the two liquids into intimate contact. In the operation of separating one liquid from the other, the spring clamp 16 is opened and the bulb 14 simultaneously compressed. When said bulb 14 is fully compressed the lower end of the suction tube is closed by releasing the pressure on the clamp. The pressure on the

bulb 14 is then slowly relaxed until both arms of the siphon are filled with the liquid to be siphoned, the clamp is then opened and the liquid siphons over.

5 The device may be employed for siphoning off a liquid without the necessity of drawing the liquid into the mouth or of breathing offensive and poisonous vapors as in the use of an ordinary pipette, as the
10 necessity of starting the siphoning operation by mouth suction is obviated by the use of the rubber bulb.

In addition to the advantages before stated resulting from the form of funnel
15 employed, it is apparent that when it is desired to remove the top layer of liquid in the funnel this may be more perfectly carried out when the surface of the last portion of the liquid is narrowed down to
20 that of the constricted neck 3 than is possible with funnels of ordinary construction. It is also much easier to break up emulsions so frequent in extraction work by confining them to a narrow space as in the neck 3 than
25 it is in the ordinary separatory funnel. Where three layers of liquid are formed in the funnel, it is also possible to remove the middle layer without disturbing the other two.

30 Having thus described our invention, we claim:—

1. A separatory apparatus comprising a funnel embodying upper and lower bulbs connected by a constricted neck, and a siphon-
35 ing device having its inlet leg extending

down through the upper bulb into said constricted neck.

2. A separatory apparatus comprising a funnel embodying upper and lower bulbs connected by a constricted neck, a siphon
40 tube having its inlet leg extending down through the upper bulb into said constricted neck, a suction tube communicating with the discharge leg of the siphon tube, an aspirator connected with the suction tube,
45 and a closure for the discharge end of said tube.

3. A separatory apparatus comprising a funnel embodying upper and lower bulbs connected by a constricted neck, a stopper
50 fitted in the mouth of the upper bulb and provided with an opening and an air inlet, a valved outlet from the lower bulb, a siphon tube having its inlet leg extending through the opening in the stopper and through the
55 upper bulb into said constricted neck, a suction tube intermediately connected with the discharge leg of the siphon and provided at its upper end with an aspirator bulb, a flexible discharge nozzle upon the lower end
60 of said suction tube, and a clip to engage and compress said nozzle.

In testimony whereof we affix our signatures in presence of two witnesses.

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Witnesses:

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