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A Compact Steam Distillation Apparatus

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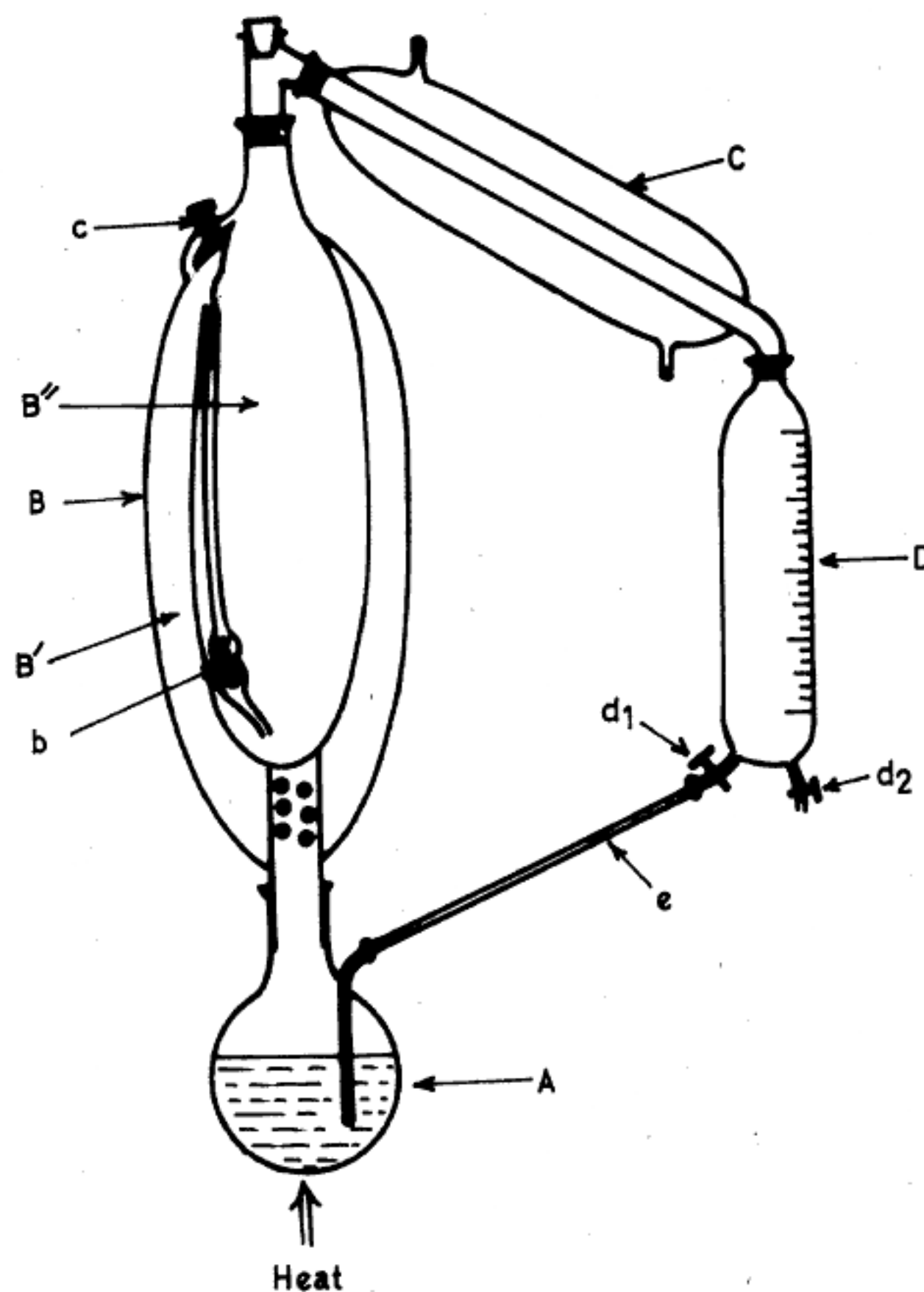
The commonly used steam distillation apparatus contains two parts. In one part the steam is generated while in the another parts the compound/material is distilled. Both parts are heated separately. This apparatus is complicated and difficult to handle. In view of this, a very compact steam distillation apparatus was designed and is reported in this paper. In this apparatus both the above parts have been arranged into a single compact assembly with a single heating source. The apparatus is shown in the figure. The various parts of the apparatus are as follow.

1. *Steam Generator (A)*: A round-bottom flask of 1000 mL, which can be heated by any heating device. The steam is generated in this part.
2. *Steam Distillator (B)*: A cylindrical structure with a B 24 perforated adapter at bottom and a B 24 receiver on top. It contains two chambers, B' and B''. Chamber B' is linked to chamber B'' by a one-way working valve b. The chamber B' contains a steam regulator valve c.
3. *Condensation and Receiver*: This part contains a normal water condenser C and a graduated receiver D. The receiver contains two taps (d₁ and d₂) at its bottom. The d₁ tap is attached to the steam generator by a glass tube e.

Working of the Apparatus

The round-bottom flask (A) is filled with water in such a way that the glass tube e remains dipped in water. The steam is generated by heating the flask. The organic compound to be distilled is filled in chamber B'' with water. The steam from the steam generator is passed into chamber B'' through chamber B' and valve b. The chamber B'' is heated by the steam passing through chamber B'. The valve b works in one direction only, so that steam passes from chamber B' to chamber B'' and water (from chamber B'') cannot enter into chamber B'. The heating of the chamber B'' and the pressure of steam in the chamber B'' is regulated by valve c. The organic compound and water condense (as in normal steam distillation) into the water condenser. The distilled organic compound and water pass into the graduated receiver (D). The organic compound is collected by d₂ tap and the water is allowed to pass into flask A by tap d₁ for further steam generation.

The apparatus has been used for the recovery of various essential oils from different parts of the plants and to pu-



Compact steam distillation apparatus.

rify many organic compounds. Thus, the apparatus is more compact, easy to handle, and economic.

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