Feb. 27, 1962 E. R. CORNISH, JR 3,023,293

CONSTANT TEMPERATURE HEATER FOR MICROTOME OBJECT DISCS

Filed Nov. 16, 1959

Fig. 1

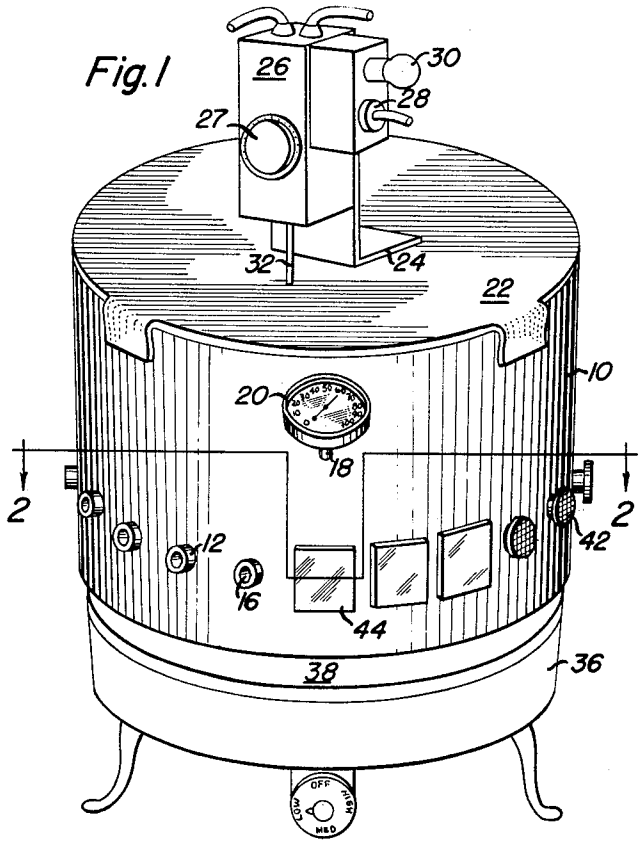


Fig. 2

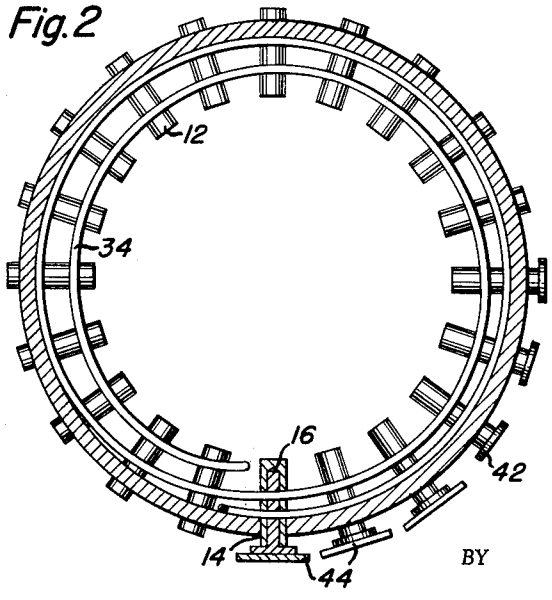
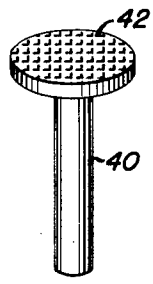


Fig. 3



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CONSTANT TEMPERATURE HEATER FOR MICROTOME OBJECT DISCS

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The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment to me of any royalty thereon.

This invention relates to an apparatus for attaching and removing of microtome object discs to and from paraffin blocks.

The usual method for attaching microtome object discs to paraffin blocks is to heat the heads of the microtome object discs in an open Bunsen burner flame until the head of the microtome object disc becomes warm enough to melt the surface of the paraffin block when the two are brought into contact. Likewise the usual method for removing microtome object discs from paraffin blocks is to hold the ends of the shafts of the microtome object discs in an open Bunsen burner flame until enough heat is conducted to the head of the microtome object disc to melt the surface of the paraffin block and allow the paraffin block to fall off. There are a number of disadvantages to these methods, the main one being that the process is very time consuming. It was felt that a device that would heat a number of microtome object discs to the proper temperature for attachment to or removal from paraffin blocks would be of great use in the histology laboratory.

The object of this invention is an apparatus which overcomes the above named deficiencies.

FIG. 1 shows a side assembly view of my apparatus.

FIG. 2 shows a sectional view along lines 2—2 of FIG. 1.

FIG. 3 shows example of microtome object disc.

Referring to the drawing, the device consists of a cylindrical brass water bath **10**. There are approximately twenty tubular inserts **12** soldered into apertures **14** drilled several inches from the bottom of the bath and spaced uniformly around the circumference of the bath. Each insert consists of a solid brass rod wherein a hole **16** is drilled a distance about 95% of the rod's length. The apertured ends of these inserts project a small distance through the outside wall of the water bath. A smaller insert **18** is provided near the top of the tank and is angled downwardly from the top section. This insert has a hole drilled completely through its entire length for the purpose of inserting a thermometer **20** into the bath.

The water bath is provided with a loosely fitting brass cover **22** by which the water level can be checked and additional water added as required. The bath is filled with distilled water to which has been added a proprietary non-corrosive germicide-disinfectant to inhibit microbial growth and to minimize corrosion.

Attached to a mounting bracket **24**, which is connected to the cover, are a thermostat **26**, a thermostat dial **27**, an electrical outlet **28** controlled by the thermostat, and a pilot light **30** connected in parallel with the thermostatically controlled outlet. The sensing element of the thermostat is a fluid filled capillary tube **32**. It passes through a small hole in the water bath cover and is formed into a large coil **34** which rests upon the circle of inserts inside the water bath.

The water bath is placed upon an electrical hot plate **36** which is plugged into the outlet controlled by the thermostat mounted on the top of the water bath. The

hot plate has a circular heating surface **38** and is provided with a four position switch: off, low—300 watts, medium—600 watts, and high—1,200 watts. In use the hot plate is switched to the high position initially until the water bath reaches the proper operating temperature (10–15° C. above the melting point of the paraffin being used) as indicated by the thermometer and/or the cycling of the thermostat as indicated by pilot light. The switch may then be turned to the low position for more even control of the water bath temperature by the thermostat. The operating temperature is reached in about 90 minutes so that if the device is to be used frequently it is best to leave it in operation continuously, taking care to check the water level periodically.

The microtome object disc as seen in FIG. 3 consists of a solid metal bar **40** attached to a knurled cap **42** at the top which holds the paraffin **44** as shown in FIG. 2.

The method of operation will now be set forth.

(1) *For attaching microtome object discs to paraffin block.*—A microtome object disc is placed in each of the inserts. Within about 90 minutes all of the microtome object discs will have reached the proper temperature for attachment to the paraffin blocks. One microtome object disc is removed from the device and pressed against the back of a paraffin block. The temperature of the microtome object disc will be such that it will melt the paraffin sufficiently for the firm attachment of the microtome object disc to the back of the paraffin block, but will not damage the paraffin block by excessively melting paraffin. The paraffin block and the attached microtome object disc are then cooled in a pan of cold water. The empty insert is then filled with a microtome object disc and the next warm microtome object disc is removed for attachment to a paraffin block. By using the microtome object discs in rotation around the bath and promptly replacing each disc as it becomes warm. A constant supply of microtome object discs heated to the proper temperature for attachment to paraffin blocks is insured. The microtome object discs are heated to the proper temperature at a rate faster than they can be attached to the paraffin blocks by the technician.

(2) *For removing microtome object discs from paraffin blocks.*—A microtome object disc with paraffin block attached is placed in each of the inserts. The microtome object discs are then automatically heated to the proper temperature and the paraffin blocks fall off onto the table top without any evidence of thermal or mechanical damage. Usually the blocks will be removed faster than the technician can replace the microtome object discs in the circle of inserts around the water bath.

(3) *For simultaneous removal from and attachment to paraffin blocks of microtome object discs.*—By the proper scheduling of work it should be possible to remove a number of microtome object discs at the same time that it is desired to attach blocks to a selected group of microtome object discs. A microtome object disc with paraffin block attached is placed in each of the inserts in the water bath. As soon as the paraffin blocks drop off, the microtome object discs should be at the proper temperature for attachment to the new paraffin blocks. The entire process may be repeated continuously in rotation about the bath.

It is easily seen therefore the advantages of this constant temperature heater for microtome object discs since it permits the safe, rigid attachment as well as removal of paraffin blocks from object discs.

I claim:

1. A cylindrical tank having a plurality of apertures uniformly spaced about its circumference, insert means being held in each of said apertures, each of said insert means consisting of a metallic bar which extends into the interior portion of said tank, and having a hole drilled

into it most of its entire length, a microtome object disc means comprising a knurled cap connected to a metallic bar, said metallic bar being held by said insert means and said knurled cap positioned to the outside of said insert means, a cover attached to said cylindrical tank, automatic temperature control means, support means attached to said cover for holding the automatic temperature control means, a heat transfer fluid inside said tank, and heat producing means in contact with said tank for heating the heat transfer fluid.

2. A cylindrical tank having a plurality of apertures uniformly spaced above its circumference, insert means being held in each of said apertures, and extending into the interior portion of said tank, microtome object means being held by said insert means, cover and support means attached to said cylindrical tank, automatic temperature control means attached to said cover and support means, heat transfer fluid contained inside said tank, and heat producing means in contact with said tank for heating the heat transfer fluid.

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