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MODELING TOOL

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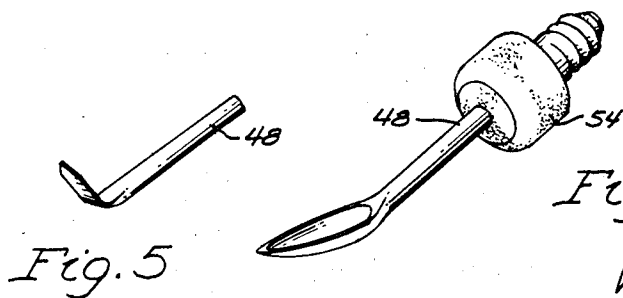
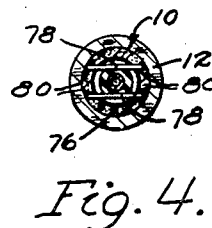
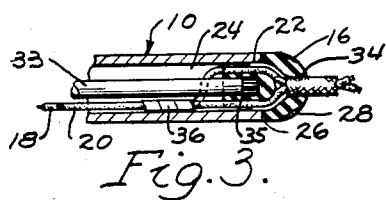
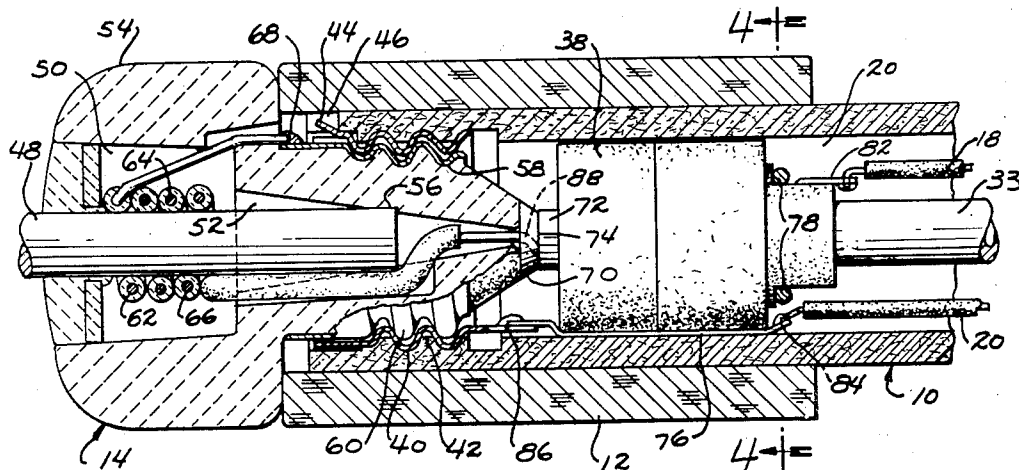
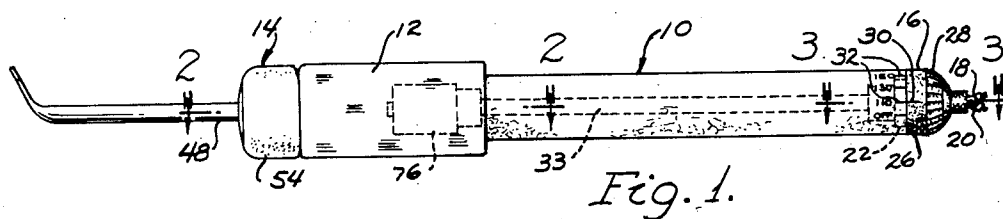


Fig. 6.

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MODELING TOOL

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3 Claims. (Cl. 219—21)

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This invention relates to instruments used for working or modeling waxes and other substances having the characteristic of melting or softening when subjected to heat, and more particularly to a modeling instrument having means for varying and maintaining predetermined heats, particularly for use in waxing up or making dentures for the dental trade.

Modeling tools of the types heretofore used have not been entirely satisfactory for a number of reasons. A tool heated in a gas or alcohol flame or on a hot plate must be often returned to the source of heat to maintain it at the proper working temperatures. The temperature after heating in a flame can only be guessed at, and successful use of this type of heating is a matter of a high degree of skill and good judgment. The frequent return of the instrument to the flame or hot plate for re-heating requires extra time and effort, and the operator must divide his mental efforts between the modeling job at hand and the judgment required in the heating of his modeling tool.

An object of this invention is to provide a tool that will remain at a proper working temperature continuously while the operator is modeling.

Another object is to provide a tool whose temperature can be regulated to a proper degree to work on different types of waxes or other substances to be modeled.

A further object is to provide a modeling instrument of a simple and compact design which can be readily used by operators skilled in the modeling trade.

Yet another object of the invention resides in the provision of a readily accessible means for manually adjusting the operating temperatures of the tool.

Still another object is to provide means for readily changing the working blade of the tool for another blade of different shape or contour best suited to perform the work at hand.

Another object of the invention is to provide a modeling instrument with a heating means that can be readily replaced if it should become defective.

Another object of the invention is to provide a modeling tool that is heated without the fire hazard of an open flame or the inherent dangers involved in the use of a hot plate.

Other objects and advantages of this invention will be apparent from the following detailed description, considered in connection within the accompanying drawings submitted for the purposes of illustration only and not intended to define

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the scope of the invention, reference being had for that purpose in the subjoined claims.

In the drawing wherein similar reference characters refer to similar parts throughout the several views:

Fig. 1 is a side elevation of my improved modeling tool.

Fig. 2 is an enlarged fragmentary sectional view, taken substantially on the line 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a fragmentary sectional view taken substantially on line 3—3 of Fig. 1 looking in the direction of the arrows.

Fig. 4 is a sectional view taken substantially on the line 4—4 of Fig. 2 looking in the direction of the arrows.

Fig. 5 is a perspective fragmentary view of a blade.

Fig. 6 is a view similar to Fig. 5 showing another form of blade or working part of the tool.

Before explaining in detail the present invention, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation and is not intended to limit the invention claimed herein beyond the requirements of prior art.

Referring now to Fig. 1 it will be observed that the invention is illustrated as being embodied in an instrument having a body 10, a gripping portion 12, a working portion 14 and an adjusting knob 16 connected to a source of electrical energy by wires 18 and 20. Wires 18 and 20 can be of any convenient length to allow free use of the instrument and may terminate in a plug, not shown, so that it may be readily connected to an electrical supply line.

The gripping portion 12 may be made of cork or any poor conductor of heat that affords a high friction gripping surface.

The adjusting knob 16 has a reduced cylindrical portion 22 which fits rotatably in the bore 24 of the body 10. The larger diameter of the knob is made to form an abutment 26 and has a corrugated portion 28 and an indicant line 30. The body 10 is marked with indicia and cooperating indicant lines 32 to indicate the various thermostat settings.

The knob has an opening 34 shown in Fig. 3 through which the wires 18 and 20 pass into the

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bore 24 of the body 10. Wires can be bound with tape 36 or otherwise held against withdrawal through the opening 34, and have sufficient length to allow turning of the knob 16 throughout its range, which in this form of my invention may be less than one complete revolution without causing the wires to strain at their terminals within the bore 24.

The knob 16 has molded integral with it a shaft 33 held against rotation by serrations 35 extending into and connected to the adjusting means of the thermostat 33.

Referring now to Fig. 2, the drawings illustrate a section through the heating element and socket of the working portion 14, and shows a thermostatic device 33. A socket liner 40 is fitted in the bore 24 with screw threads 42 and held against rotation by a tab 44 bent into a recess 46 in the body 10.

The internal construction of the working portion is also shown in Fig. 2. The shank 48 of a modeling tool extends into bores 50 and 52 of the member 54 terminating in a close fitting portion 56 of the bore 52. The shank 48 is supported at its point of emergence from the member 54 and is held against withdrawal by cement or other suitable binder substance 55 and a ceramic disc 57.

The plug end of the member 54 has a threaded end 58 to fit a thread shaped sleeve 60 which forms one of the electrical contacts for the heating elements 62. The heating element 62 may consist of several turns of high resistance wire 62 separated by electrical insulation of any suitable type 66 connected to the sleeve 60 as by hard solder 68 and terminating in a contact 70.

The part of the tool that is used to carve or model can be of various known shapes. Two illustrated forms are shown in Figs. 5 and 6.

A thermostat of any known construction has a terminal abutting against a flat portion 74 of the contact 70. It is loosely fitted in the bore 20 and allows space for terminal strip 76 to pass between the thermostat 33 and the circumference of the bore 20. The thermostat is held from movement through the bore 20 in a direction away from the socket liner 40 by two pins 78 pushed into bores 80 in body 10 after the thermostat is in place, and before the gripping portion 12 is assembled. Flattened portions 82 abutting also against the pins 78 act to prevent rotation of the thermostat per se. The shaft 33 however may rotate in the bearing 80 in the thermostat 33. The second terminal 82 is connected to the wire 13 as by soldering. The terminal 76 is connected to the wire 20 as at 84, and has its other end connected as at 86 by hard soldering or in any other suitable manner to the socket liner 40.

In the operation of the heating device, electrical current flowing in the heating element 62 heats the shank 48 of the modeling tool while in use. Heat flows into the part of the tool used in carving or modeling, and also flows to the close-fitting bore 56 of the member 54.

The member 54 can be constructed of any of several materials such for example as silica glass, borosilicate glass or ceramic materials that are good electrical insulators, not affected by heat encountered and a fair conductor of heat.

Heat flows through the member 54 to the contact 70. Heat from one end 38 of the heating element also serves to heat terminal 76. Heat is then transferred through the flat surface 70 to the contact 72 of the thermostat 33.

The thermostat 33 can be of any known construction wherein heat conducted into it through

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the contact 72 causes opening of an electrical switch after reaching a predetermined degree whereupon the switch closes again after cooling to another predetermined degree, and the opening point being adjustable by manual means. The thermostat element can thus be employed to maintain the tool 48 within temperature ranges best suited to model the substance being worked upon.

The thermostat switch construction can be selected to provide the proper ambient temperature for the work to be done on the various types of waxes and other substances to be modeled.

The markings on the body 10 are calibrated from the carving and modeling tool temperatures, and indicates a temperature within the ambit of the setting of the thermostat, or if desired the scale may be marked with the name of materials that can best be worked at different settings of the thermostat.

The operation of my improved modeling instrument is as follows: When an operator prepares to carve or model a plastic denture or other substance he turns the thermostat adjusting knob to the proper point for the wax or other material to be worked, and connects the instrument to a source of electrical current. The tool heats up to the desired working temperature and maintains the working temperature between the operating limits of the thermostat as long as desired.

Tools may be readily removed from their sockets and replaced by others of different shape and utility. If, to facilitate the work, more than one complete instrument is used, as when different types of blades are desired or when working on different substances where different operating temperatures are desired, each will maintain the working temperature of its associated working blade within the settings of the thermostat, and is ready for instant use.

The operator grasps the instrument by the gripping portion 12 or the body 10 in any desired manner, and proceeds to perform the necessary waxing up or other modeling work in the customary manner, with assurance that the working blade will at all times be maintained within the desired temperature range best suited for the particular material at hand.

If desired the heating element may be positioned in the handle, and quick acting jaws or other suitable attaching means may be employed to secure the shank 48 of different types or shapes of modeling instruments in place. The mechanism for heating the blade of the tool may be of any desired form, such for example as a filament or heating element extending into a hollowed out portion of the tool. It will also be apparent that a thermocouple or other heat conducting medium may be employed to transmit heat from the blade to the thermostat to control the actuation of the heating element in accordance with variations of the heat of the tool.

I claim:

1. A modeling instrument comprising a cylindrical body, a working portion at one end of the body, a modeling tool having its shank extending into the working portion, a heating element in the working portion in heat exchange relation with the shank of the modeling tool, a thermostat in the body adjacent the working portion, an adjusting knob at the end of the body remote from the working portion, a shaft extending from the knob to actuate the thermostat, cooperating indicia lines carried by the knob and body to indicate modeling tool temperatures, and a grip-

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ping portion having low heat transmitting characteristics and a high friction gripping surface carried by the body adjacent the working portion.

2. A modeling instrument comprising a cylindrical body including a threaded section adjacent one of its ends, a working portion having a threaded section adapted to engage the threaded section of the body, a modeling tool having its shank secured in the working portion, a heating element positioned in the working portion in heat exchange relation with the shank of the modeling tool, a thermostat in the body adjacent the threaded section thereof, a thermostat adjusting knob at the end of the body remote from the threaded section, a shaft extending from the knob to actuate the thermostat, and a gripping portion having low heat transmitting characteristics and a high friction gripping surface carried by the body adjacent the working portion.

3. A modeling instrument comprising a body portion having a threaded section adjacent one of its ends, a working portion having a threaded action adapted to engage the threaded section of the body, a modeling tool having its shank secured in the working portion, a heating element positioned in the working portion in heat exchange relation with the shank of the tool, a

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thermostatic switch positioned in the body portion adjacent its threaded section, a switch adjusting knob at the end of the body remote from its threaded section, motion transmitting means secured to the knob to actuate the thermostatic switch, electric conducting means extending through the body portion to the thermostatic switch, electric conducting means interconnecting the thermostatic switch and the heating element through said threaded sections, and a gripping portion having low heat transmitting characteristics and a high friction gripping surface carried by the body adjacent the working portion.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,544,554	Cameron	July 7, 1925
1,909,774	Lindsay	May 16, 1933
2,101,445	Moore	Dec. 7, 1937
2,206,994	Zent	July 9, 1940
2,243,400	Stack	May 27, 1941