Nov. 2, 1943. E. K. CLARK ET AL 2,333,521

SADIRON

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Fig. 1.

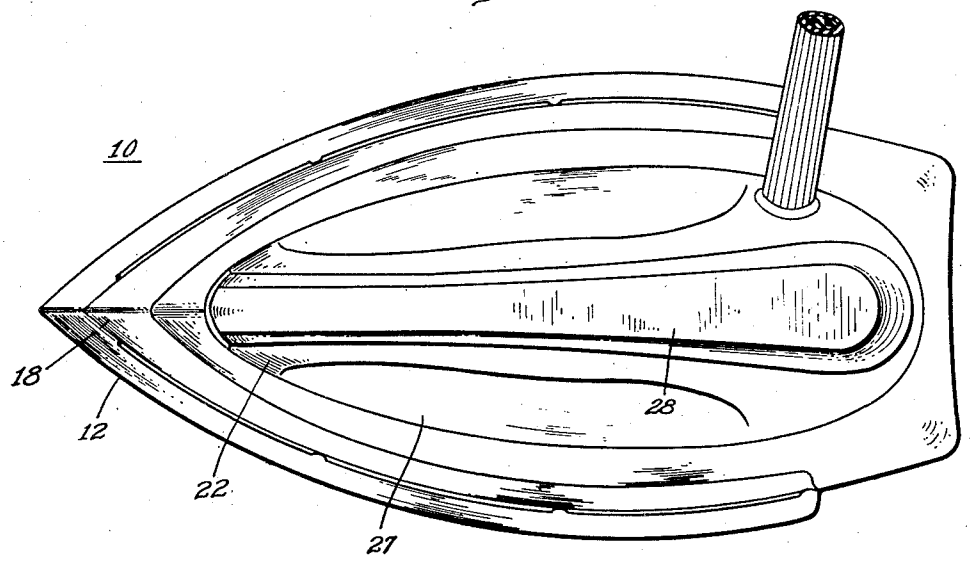
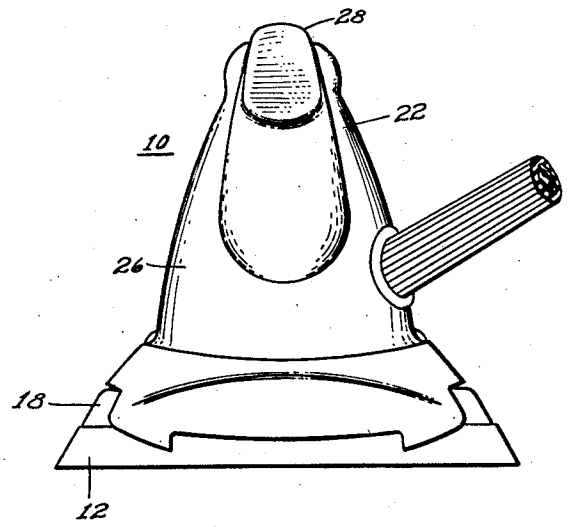


Fig. 2.



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SADIRON

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Fig. 5.

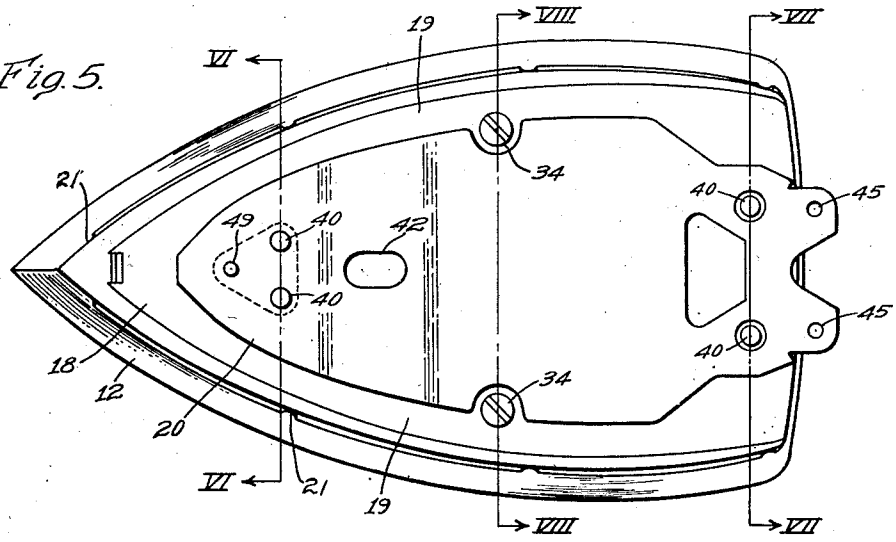


Fig. 6.

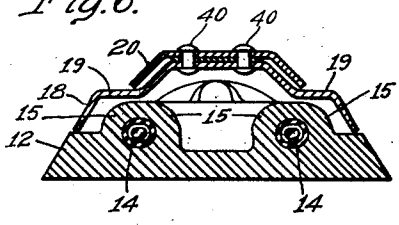


Fig. 7.

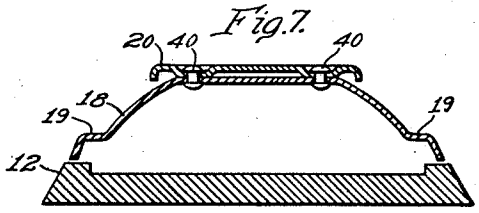
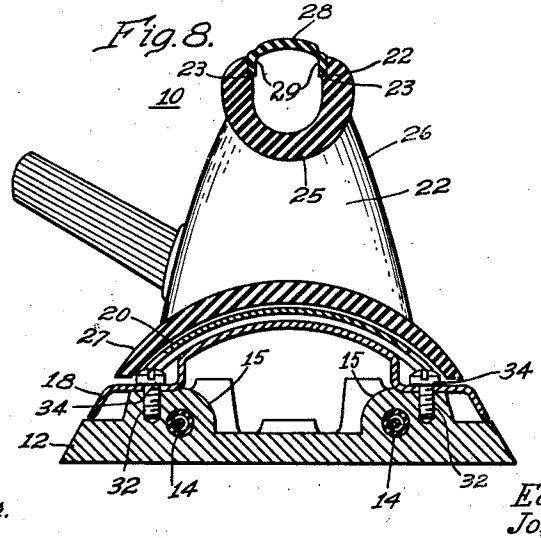


Fig. 8.



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SADIRON

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Fig. 3.

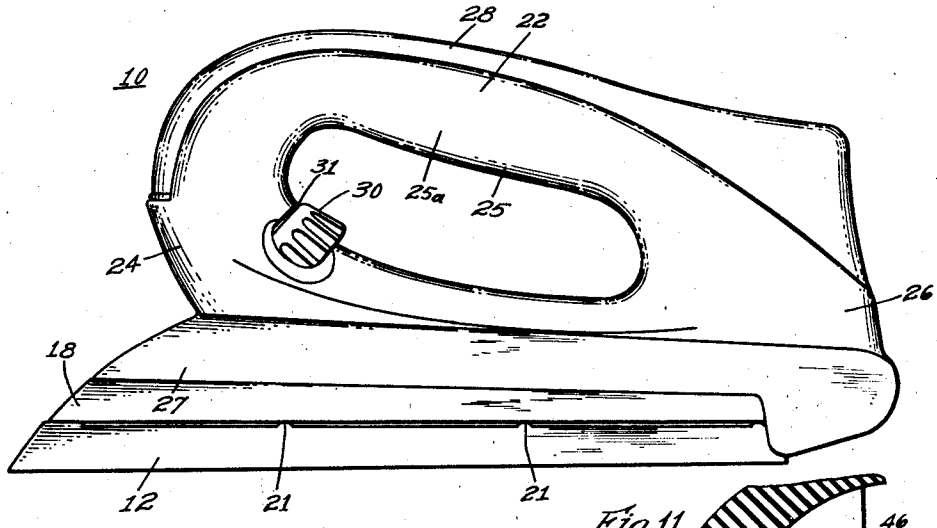


Fig. 11.

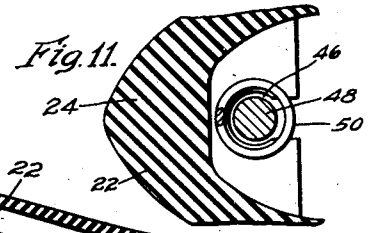


Fig. 4.

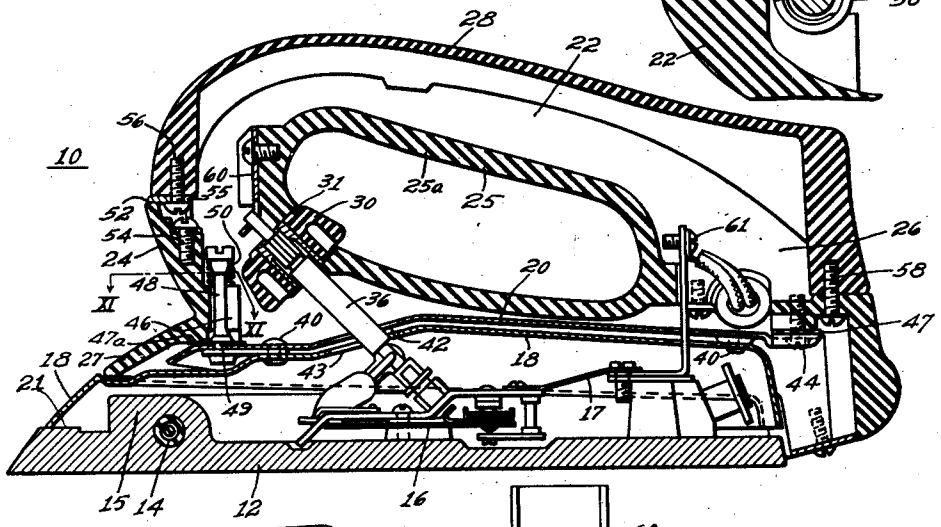


Fig. 9.

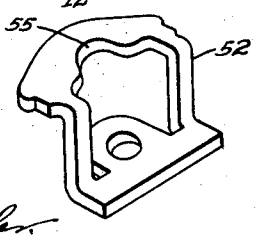
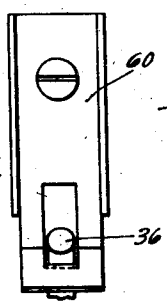


Fig. 10.



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Patented Nov. 2, 1943

2,333,521

UNITED STATES PATENT OFFICE

2,333,521

SADIRON

Earl K. Clark and Joseph Raymond Heilman, Mansfield, Ohio, assignors to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application March 24, 1941, Serial No. 384,919

3 Claims. (Cl. 38—90)

Our invention relates to sadirons, and more particularly to the thermal insulation and mechanical construction of such devices.

An object of our invention is to provide an integrally constructed handle and cover for an iron which has sufficient strength to support and carry the iron structure during normal operations thereof, and which provides an effective thermal insulation therefor.

Still another object of our invention is to provide a composite insulation structure for the upper portion of an iron which has sufficient mechanical strength to permit a handle to be attached thereto.

Another object of our invention is to provide a plurality of air pockets or air spaces intermediate the iron sole-plate and the handle structure for materially reducing the temperature of the upper surface of the iron with respect to the ironing surface thereof.

A further object of our invention is to provide flexible means for attaching a handle to the main iron structure so as to permit free relative contraction and expansion of the handle with respect to the iron structure.

It is still a further object of our invention to provide a hollow composite iron handle structure which has a removable top portion permitting the complete concealment of attaching screws and the use of a highly artistic two color toned structure.

Other objects of our invention will either be pointed out specifically in the course of the following description of a device embodying our invention, or will be apparent from such description.

In the accompanying drawings:

Figures 1 and 2 are top plan and rear elevational views, respectively, of a sadiron structure embodying our invention;

Fig. 3 is a side elevational view of the device shown in Figs. 1 and 2;

Fig. 4 is a longitudinal sectional view of the device shown in Fig. 3;

Fig. 5 is a top view of the sadiron structure with the handle structure removed therefrom;

Figs. 6 and 7 are sectional views taken along the lines VI—VI and VII—VII, respectively, of Fig. 5;

Fig. 8 is a sectional view taken along the line VIII—VIII of Fig. 5 with the handle structure positioned thereon;

Fig. 9 is a perspective view of a portion of the device embodying our invention;

Fig. 10 is a front view of a portion of the device shown in Fig. 4; and

Fig. 11 is a sectional view taken along the line XI—XI of Fig. 4.

Referring to the accompanying drawings, in which like reference characters indicate like parts in the several figures, there is shown a sadiron structure 10 embodying a sole-plate 12, a heating element 14 associated therewith, a thermostatic structure 16, a cover plate 18 and a baffle plate 20 spaced above and attached to the sole-plate 12, a handle structure 22 including front and rear depending portions 24 and 26, respectively, a longitudinally extending grip portion 25 including a bottom part 25a and a removable top cover portion 28, and a thermostat control knob 30 positioned within the front depending portion 24 of the handle structure 22 and connected with the thermostatic structure 16 so as to control the operation thereof.

The sole-plate 12 comprises, in this instance, an elongated cast metallic base having the heating element 14 preferably of a sheathed type and cast within raised portions or ledges 15 which are an integral part of the sole-plate 12. The lower surface of the sole-plate is highly polished to provide a suitable ironing surface. The sole-plate 12 has two depending threaded apertures 32 therein located along a transverse axis which bisects the sole-plate structure, see Figs. 5 and 8. The sole-plate is thus adapted to receive and rigidly retain the cover plate 18 by means of suitable screws 34 positioned within the apertures 32, as hereinafter more fully described. It is to be understood that while the sole-plate illustrated in the iron structure embodying our invention is formed of a cast metal with the heating element formed therein, such sole-plate may be made in any other suitable manner.

The thermostatic structure 16 is positioned at substantially the midpoint of the sole-plate 12 and is closely associated therewith so as to be responsive to the changes in temperature of such sole-plate in keeping with well-known practice. The thermostatic structure is electrically connected with the heating element 14 in a familiar manner to control the operations thereof in accordance with the changing temperature conditions of the sole-plate. Such connection is made by suitable electrical conductors 17. The thermostat 16 is selectively controlled by an operator through the control knob 30 and an inclined axis adjusting shaft 36.

The control shaft 36 extends upwardly and forwardly, passing through suitable apertures 42

and 43 in the baffle 20 and cover plate 18, respectively, and is journaled within a suitable bracket 60 rigidly attached to the inner portion of the front depending portion 24 of the handle 22 (see Figs. 4 and 10). The control knob 30 is positioned upon and slidably splined to the upper end of control shaft 36 and provides means for readily rotating such control shaft to adjust the operations of the thermostat. The control knob 30 is positioned within an opening 31 in the rear surface of the front portion 24 of handle 22. The control knob 30, by being located within the rear surface of the front portion 24 is thus exposed and provides means whereby the thermostat is readily and selectively adjustable by an operator. With the control knob positioned within the rear surface of the front handle portion 24, such knob is readily accessible by the operator's thumb or index-finger as she grasps the handle 22 during the normal operations of the iron 10, thus permitting the operator to vary the thermostat setting without changing or releasing her grip upon the handle structure. This feature is more fully described and claimed in a copending application of E. K. Clark and J. S. Wojcik, Serial No. 384,918, filed March 24, 1941, assigned to the assignee of this application.

The thermostat 16, illustrated in the accompanying drawings, is more fully described and claimed in the copending application of E. K. Clark and J. S. Wojcik hereinabove identified. However, it is to be understood that any other suitable thermostatic device may be used in lieu thereof.

The cover plate 18 comprises, in this instance, substantially an inverted elongated cup-shaped member which is adapted to fit over the sole-plate 12 with the central portion thereof retained a certain distance above the midpoint of the sole-plate 12 so as to house the thermostat 16 and also provide an air pocket. The cover plate 18 includes depending side and end portions which are adapted to rest upon the upper outer edge of the sole-plate in keeping with well established practices. Longitudinally extending flat portions 19 are located within the cover and are located above the ledge 15 in sole-plate 12. The central portion of the cover plate, through the flat portions 19 thereof, engages the sole-plate at only two points on the raised portion or ledge 15 thereof and is rigidly attached thereto by means of the screws 34, which threadedly engage with the sole-plate (see Fig. 8). Due to this two point contact, the thermal conductivity between the sole-plate and cover plate is maintained at a minimum. In addition to this minimum mechanical contact between the cover plate and the sole-plate, the cover plate 18 contacts the sole-plate about its outer edges through a plurality of upwardly extending bosses 21 (seven in this instance) on the sole-plate, see Figs. 3 and 4.

Accordingly, it follows that the thermal conduction between the sole-plate 12 and cover plate 18 is maintained at a minimum. The dead air space between the central control portion of the cover plate and the sole-plate acts as a further heat insulator tending to prevent the flow of heat therebetween.

The baffle plate 20 comprises, in this instance, a shallow inverted substantially triangular cup or saucer-shaped member somewhat smaller than the cover plate 18. Said baffle plate 20 is positioned above the cover plate 18 and is rigidly attached thereto by means of a plurality of rivets 40. Two rivets are located at the front end of the baffle plate 20 and two rivets are positioned at the rear end of the baffle plate so as to provide a four-point contact between the cover plate and the baffle plate. By having the rivets 40 positioned at each end of the baffle plate, away from the central or hottest portion of the sole-plate, the thermal conduction between the baffle plate 20 and cover plate 18 is reduced to a minimum. The rivets 40, in addition to rigidly attaching the cover plate 18 and baffle plate 20 together, retain the baffle plate 20 slightly above the cover plate so as to provide an air pocket or air space therebetween. By having the baffle plate 20 retained above the cover plate and but a four-point contact therebetween, it follows that the passage of heat from the sole-plate 12 through the cover plate 18 to the baffle plate 20 is held at a minimum value.

It has been found that the air pockets between the baffle plate 20 and cover plate 18 and the cover plate 18 and sole-plate tend to lower the temperature differential between the cover plate 18, sole-plate 12 and between the baffle plate and cover plate substantially 75° F. for each air pocket. The total temperature differential between the baffle plate and sole-plate, due to the air spaces and small number of contacts between the component parts is substantially 150° F.

Small irregular or elliptically shaped apertures 42 and 43 are positioned within the front central portions of the baffle plate 20 and the cover plate 18, respectively, to provide means for the inclined thermostatic control shaft 36 to pass therethrough, as hereinafter more fully described.

The handle structure 22 comprises, in this instance a structure having a front depending portion 24 and a rear depending portion 26 which are joined at their upper ends by a longitudinally extending grip portion 25 and at their lower ends by a longitudinally outwardly and downwardly extending skirt portion 27. The parts 24, 25, 26 and 27 of the handle structure are, in this instance, formed of a suitable phenolic resin into a single integral structure. However, it is to be understood that such structure may be formed in any other suitable manner.

The upper longitudinally extending portion 25 of the handle 22 has a depending longitudinally extending semi-circularly groove formed therein while the end portions 24 and 26 are hollowed out. The upper portion 25 of handle 22 has outwardly extending ledges 23 formed therein which receive the cover 28, as hereinafter described. This tends to make a substantially light handle structure by reducing its mass. The reduction in mass, in addition to making a lighter handle structure, tends to materially reduce the thermal capacity of said iron handle and aids in keeping the temperature thereof at a minimum value. The reduction in thermal capacity is, of course, furthered by the lack of metal parts, the cover portion 28 likewise being non-metallic, as subsequently described.

The lower or skirt portion 27 of handle structure 22 extends outwardly from the depending portions 24 and 26 of the handle 22 as well as joining such end portions so as to provide a single integral heat-insulating cover member for the upper portion of the sadiron structure. The outer portions of the skirt 27 extend away from the handle proper and extend over and beyond the edges of baffle 20 and down towards and relatively close to the flattened or ledge portions 19 of cover plate 18 (see Figs. 4 and 8). However, such skirt portion 27 does not engage or

contact the cover plate 18 so as to provide a path for heat conduction therebetween. The skirt portion 27, in addition to extending outwardly from the main handle portion 22, joins the inner edges of the depending end portions 24 and 26 so as to provide an additional or third air pocket or space above the sole-plate 12. This third air space is above the baffle plate 20 and tends to reduce the temperature radiated upwardly to the handle structure from said baffle plate. The amount of reduction in temperature between the baffle plate and upper exposed surface of the handle skirt 27 has been found to be substantially 150°. It is, therefore, obvious that by having the skirt portion 27 positioned above the baffle plate 20 and cover plate 18, an additional heat barrier is provided above the sole-plate 12 which further prevents the upward radiation and conduction of heat from the sole-plate towards an operator's hand which grasps the grip portion 25 of handle 22.

The handle structure 22 is, in this instance, rigidly attached to the baffle plate 20 at only one end thereof, namely, by means of the rear end portion 26. In addition, the handle 22 is loosely or resiliently attached to the baffle plate 20 at the front end so as to permit relative movement between the handle structure and the baffle, cover plate and sole-plate. The handle is rigidly attached, by the rear end thereof, to the baffle plate 20 by means of two screws 44 which pass through suitable apertures 45 in an extending rear end portion of the baffle plate 20 (see Figs. 4 and 5). Suitable heat insulating washers 47, preferably of asbestos, are positioned intermediate the handle 22 and the baffle plate 20 to further limit the conductivity of heat into the handle structure.

The handle structure 22 is movably attached to the baffle plate 20, at the front end thereof, by means of the front end portion 24 of the handle structure 22. A notched or slotted aperture 46 (see Fig. 11) is positioned within the inner surface of the front section of the front end portion of the handle 22. An elongated shoulder screw 48 is positioned through said slotted aperture 46 and engages a threaded aperture 49 at the front end of the baffle plate 20 so as to permit the front end portion of the handle to be movably attached thereto. A coiled resilient member or spring 50 is positioned between the handle portion 24 and the head of screw 48 (see Figs. 4 and 11) so that such screw may be tightened down against the baffle plate 20, however, without rigidly attaching the front end portion of the handle to the baffle plate. It therefore, follows that, due to the resilient connection between handle 22 and baffle plate 20, the front end portion 24 of handle 22 is free to move with respect to the baffle plate 20. Accordingly, the handle 22 is free to expand and contract, due to changes in temperature thereof, without any binding action between said handle and baffle plate 20. An insulating washer 47a is also positioned intermediate the handle structure 22 and baffle plate 20 to reduce the heat conduction therebetween.

An irregular-shaped bracket 52 is rigidly attached to the leading or front end of the front end portion 24 of the handle 22 by means of a suitable screw 54. A slot 55 is positioned within the upper portion of the bracket 52 (see Fig. 9). The bracket 52 is then used to provide means for attaching the front end of the removable top cover portion 28 to the handle 22, as hereinafter described.

The removable top cover portion 28 of handle structure 22 comprises, in this instance, an elongated relatively thin flexible or resilient inverted channel-shaped member which is constructed to fit within the upper edge of the handle 22. The top cover 28 is preferably made of a translucent phenolic material or the like, such as "Plascon," for example, so as to permit the designer of the iron structure to use a two-tone or double-color effect. The removable cover 28 has depending side portions 29 which fit within the upwardly extending hollowed portion of handle 22 resting upon the ledges 23 thereof and extends thereabove (see Figs. 4 and 8). A set screw 56 extends upwardly into the front end of the cover 28. This set screw 56 cooperates with the irregular shaped bracket 52 by sliding within the slot 55 therein.

Accordingly the front end of cover 28 is attached to the front end portion of handle structure 22 without exposing any attaching means. The cover portion 28 has a transverse section slightly greater than that of the grooved portion 25 of handle 22 whereby the cover must be forced downwardly into the handle 22. The rear end of cover 28 is rigidly attached to the handle 22 by means of a suitable screw 58 which extends upwardly through the rear portion 26 of handle 22 (see Fig. 4). The screw 58 is only accessible from the bottom portion of the iron so as to provide a symmetrical design of the iron structure without any exposed attaching screws or the like. The removable cover 28 by fitting over the handle 22 covers up the screw 48 which is used to attach the front portion of the handle to the baffle plate, as well as the openings in each end portion of the handle 22. This structure, in turn, prevents the handle 22 from being removed from the iron structure without first removing the cover portion, and provides a pleasing exterior for said handle. In addition, the cover portion 28 covers the upper end of the thermostat adjusting shaft 36 and supporting bracket 60 positioned within the front portion 24 of the handle as well as covering up the terminal structure and miscellaneous screws, etc., in the rear portion 26 of the handle.

During the operation of the sadiron structure embodying our invention, the sole-plate may increase to substantially 500° F, in keeping with established practice. However, the air space between the cover plate 18 and such sole-plate tends to limit the upward radiation of heat from the sole-plate. The conduction of heat from the sole-plate is definitely limited due to the two-point attachment between the cover plate and the sole-plate and due to the limited amount of contact between the outer edge of the cover plate 18 and the sole-plate. Accordingly, the temperature of the upper portion of the cover plate 18 is materially reduced with respect to that of the sole-plate 12. Due to the four-point contact or suspension of the baffle plate 20 upon and above the cover plate 18 a second air pocket is provided which, further reduces the temperature above the sole-plate. These air pockets tend to prevent any direct radiation of heat upwardly, thus materially reducing the temperature of the baffle plate beneath that of the cover plate. The temperature of the baffle plate is, therefore, substantially below that of the cover plate.

The restriction of heat passage upwardly from the sole-plate is further limited, because of the three-point insulated contact between the han-

dle structure 22 and the baffle plate 20, and the absence of any direct contact between the handle structure and the cover plate or sole-plate. The skirt portion of the handle structure 22 provides a third air pocket or air space above the sole-plate which reduces the temperature therebetween.

It is, therefore, obvious that due to the plurality of air spaces located above the sole-plate and the irregular and limited path of thermal conduction between the handle structure and the sole-plate, such handle structure receives only a small amount of heat from the sole-plate. This heat is, however, readily dissipated from the handle structure due to its composition and its light mass. Accordingly, it follows that the temperature of the handle and its associated parts, which are close to the operator's hand, are substantially below that of the sole-plate. In fact, it has been observed that the actual temperature drop between the sole-plate and the upper surface of the skirt portion 27, during the high heat operation of the iron, when the temperature of the sole-plate is substantially 500° F., is substantially 300° F. A relatively cool handle structure is, therefore, provided which may readily expand and contract with respect to the sole-plate, by reason of the above-described resilient connection including screw 48 and spring 50 located at the front of the handle.

In addition, by having the upper removable cover portion of the handle removable from the handle structure, it becomes possible to attach such handle structure to the main portion of the iron by means of suitable screws hereinabove described without having such screws exposed. Likewise, said cover plate provides a medium for greater artistic treatment of the sadiron structure.

Various modifications may be made in the device embodying our invention without departing from the spirit and scope thereof, and we desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art and the appended claims.

We claim as our invention:

1. In a sadiron, a sole-plate, a heating element therefor, a thermostat positioned upon the sole-plate for selectively operating the heating element, a baffle plate positioned above said sole-plate, a handle structure embodying a hollowed front depending portion, a thermostat adjusting knob positioned within the rear surface of and extending into said depending portion, a rearwardly and downwardly extending shaft connecting said knob with the thermostat, and means positioned within the hollowed front depending portion of the handle for retaining the upper end of the shaft and the knob in cooperative engagement, said front handle portion being resiliently attached to the baffle plate to permit relative movement between said plate and handle.

2. In a sadiron, a sole-plate, a cover plate rigidly attached to the sole-plate, a continuously hollow handle structure embodying a front vertically hollow depending portion, a rear vertically hollow depending portion and a longitudinally extending horizontally hollow grip portion, said grip portion comprising a trough-like lower portion and a removable cover therefor having its front and rear ends forming parts of said front and rear portions, means extending into the hollow of said rear portion for rigidly attaching said rear portion to the cover plate, means extending into the hollow of said front portion for loosely attaching said front portion to the cover plate, and means comprising said removable cover for concealing both of said attaching means.

3. In a sadiron, a sole-plate, a cover plate rigidly attached to the sole-plate, a continuously hollow handle structure embodying a front vertically hollow depending portion, a rear vertically hollow depending portion and a longitudinally extending horizontally hollow grip portion, said grip portion comprising a trough-like lower portion and a removable cover therefor having its front and rear ends forming parts of said front and rear portions, means respectively extending into the hollows of said front and rear portions for attaching the handle structure to the cover plate near the front end and the rear end thereof, means comprising said removable cover for concealing both of the attaching means, and means extending within the front and rear ends of said cover for concealedly attaching the same to said handle structure.

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