

Feb. 11, 1947.

W. C. HALL, JR

2,415,688

INDUCTION DEVICE

Filed May 5, 1943

2 Sheets-Sheet 1

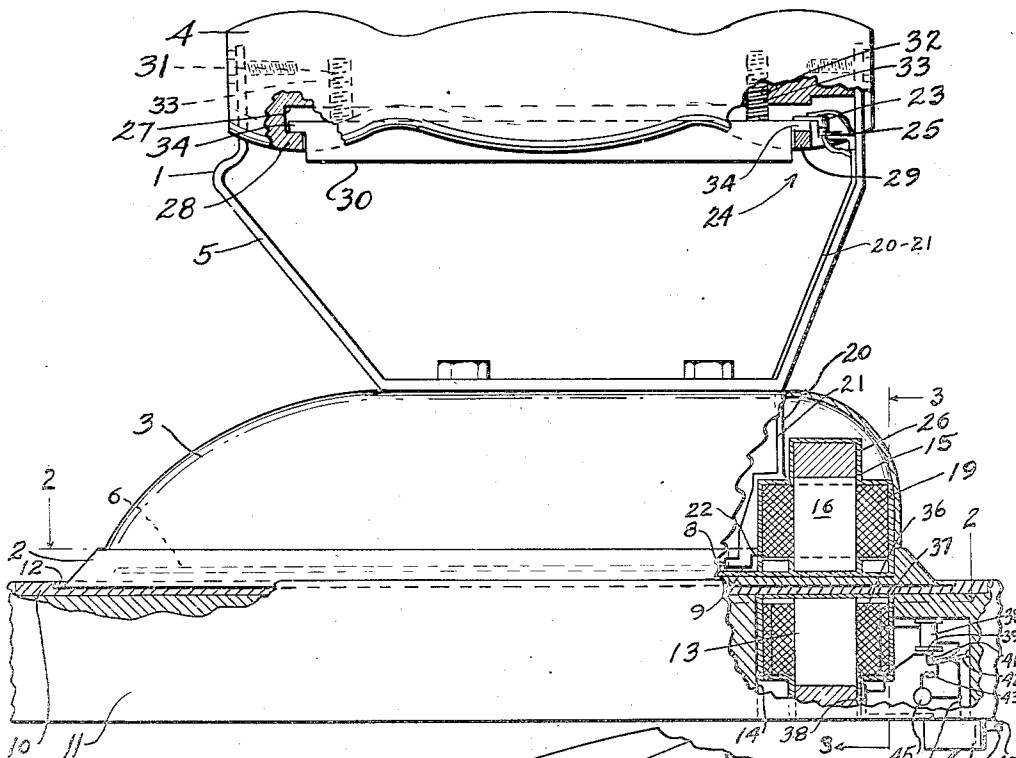


FIG. 1

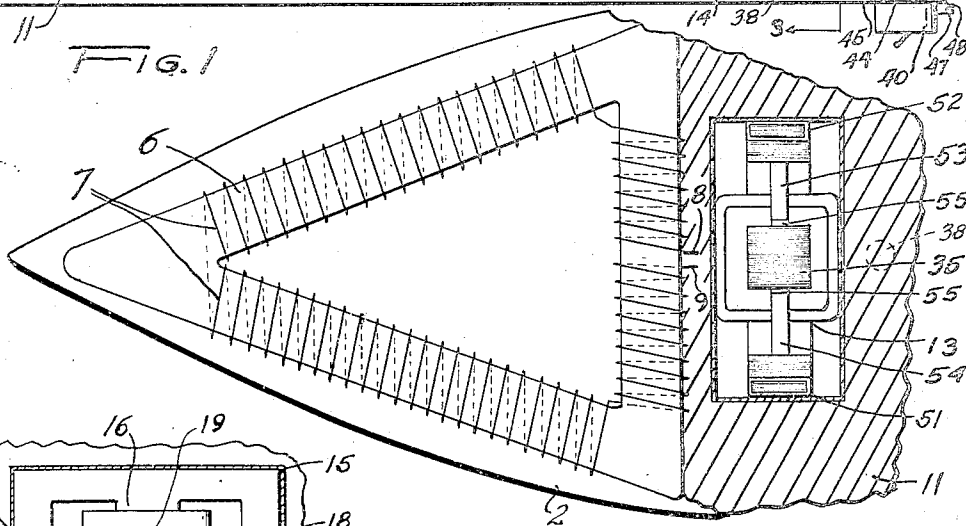


FIG. 2

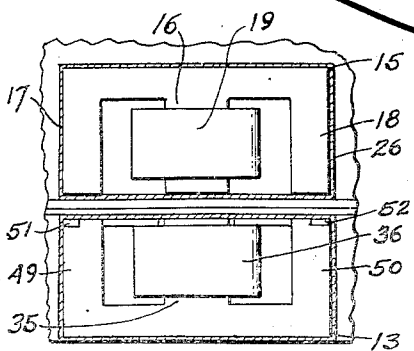


FIG. 3

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2 Sheets-Sheet 2

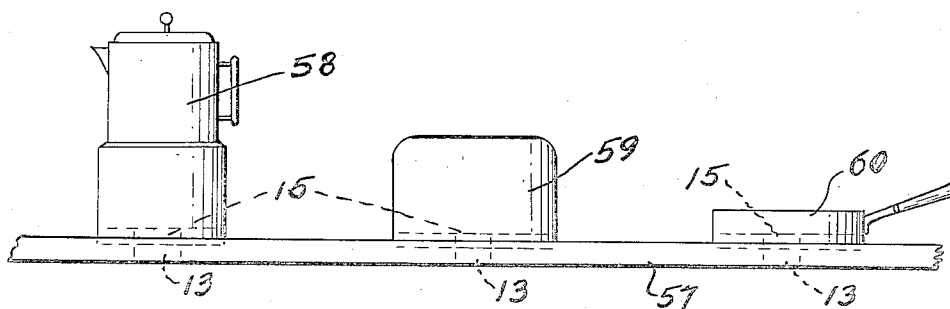


FIG. 4

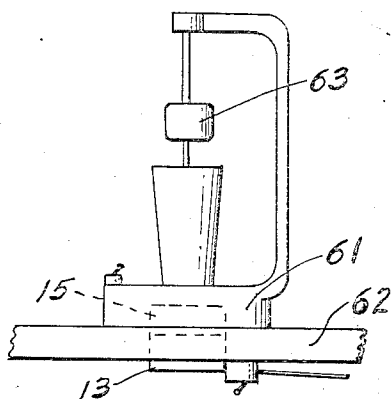


FIG. 5

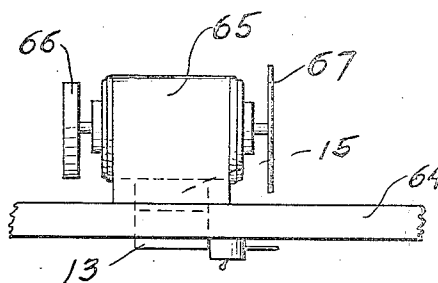


FIG. 6

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INDUCTION DEVICE

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2 Claims. (Cl. 219—25)

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This invention was conceived to eliminate the need for cords, wires and the like from portable electrical devices and appliances such as lighting devices, hand irons, percolators, waffle irons, mixers, chafing dishes, juice extractors, radios, etc. Cords, as now commonly used for electrically connecting such portable devices to wall and floor receptacles and sockets, have long been a nuisance, fire hazard, dangerous and an unsightly necessity in homes, restaurants, workshops and other places where portable electrical devices have been needed. It is a purpose of this invention to obviate such cords and wires wherever possible.

The aims of this invention are accomplished by utilizing electrical induction means, that is, to provide one or more substantially fixed primary transformer elements or induction outlets which are concealed or nearly concealed in the walls, floors, ceilings, cabinets or other fixtures of buildings or outdoor locations, and to provide a complementary receiver or transformer secondary unit or units designed to be placed in the field of the primary transformer outlet so that electrical energy can readily be utilized without the aid of cords or wires between the outlet and the secondary units.

This invention is especially useful when combined with ironing boards and the like since it is readily apparent that an ironer can do much better and quicker work when there is no cord dangling from the iron, and also due to the lack of cord, troubles such as shorts caused by wear thereof and also attachment plug breakages. Therefore, work stoppages and delays caused by these cord faults are eliminated.

One of the principal objects of this invention is to present a cordless and wireless means for transferring electrical power from fixed outlets to power receivers, such means being sturdy and simple in construction and economical to make and use.

Another object is to provide all kinds of portable electrical devices with cordless and wireless electrical connection to a supply of electrical power without resorting to any physical connecting means or complicated non-physical connecting means.

Other objects, advantages and features of my invention will appear from the accompanying drawings, the subjoined detailed description, the preamble of these specifications and the appended claims.

Applicant is about to illustrate and describe one of the forms of his invention in order to teach one how to make and use the same, but it is to be understood that the drawings and description thereof are not to limit the invention in any sense whatsoever, except as limited by the appended claims.

In the drawings:

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Fig. 1 shows in elevation, an electric hand iron, parts being broken away to show some parts in detail.

Fig. 2 is a horizontal section taken substantially along the line 2—2 of Fig. 1.

Fig. 3 is a vertical section taken substantially along the line 3—3 of Fig. 1.

Fig. 4 is an elevational view showing various appliances that can be used with this invention.

Fig. 5 is an elevational view of a liquid mixer using the invention.

Fig. 6 is an elevation of an electrical motor device using the invention.

The numeral 1 indicates a hand iron in general having the non-magnetic metal base shoe 2, metal base shell 3, handle grip 4 of insulating material, and its supporting frame 5. The shoe of the iron is recessed to accommodate a heating element 6 which is a triangular form of mica upon which is wound a resistor 7 in wire form having the ends 8 and 9.

The hand iron is shown as resting upon a non-magnetic metal plate 10 which is counter-sunk into the top surface of an ironing board 11. The plate 10 has a recessed area 12 which provides a well marked receiver for proper positioning of the iron.

Electrical energy is supplied to the iron by a half transformer section 13, which is the primary portion thereof, and which is positioned within the cavity 14 of the ironing board. Within the shell 3 of the iron, is a half transformer section 15, which is the secondary portion thereof, and which is positioned at the heel part of the iron and fixed to the shoe thereof in any convenient manner, as by bolts. This secondary portion or element and the primary portion or element form a complete transformer unit, the two complementary parts being adapted for electrical coupling and uncoupling with respect to each other.

The secondary portion is formed of an E laminated core stack having the central leg 16 and end legs 17 and 18; the leg 16 having a coil with the insulated wire ends 20 and 22 thereof connected to one side 23 of a switch 24 in the handle 4 of the iron and to the heating element end wire 9 respectively. The other side 25 of the switch is connected to the other heating element wire end 8 by the insulated wire 21. The entire E core and coil thereof are encased in a mica insulating shell 26.

The switch 24 in the handle is in an elongated cavity 27 with end flanges 28 and 29 as shown. In this cavity is a finger bar 30 adapted to be lifted by the fingers of the ironer when the iron is to be removed from the stand or plate 10. By breaking the secondary circuit, and the primary circuit, as well as providing shaded poles for the primary, there is very little magnetism to retard free removal of the iron from the plate

10. The switch point 25 is fixed to an insulated arm that is attached to the rear upward support of the frame 5, and the other switch point 23 has an arm that is fixed to the top of the switch lever or bar 30. Pockets 31 and 32 in the handle 4 house compression springs 33 which press against the top of the switch bar to continuously urge the bar downwardly and keep the switch points 23 and 25 in contact when the bar is not lifted. To limit the downward position of the bar, the bar has on each end a tongue 34 which engage the stops or flanges 28 and 29 of the handle.

The primary 13 of the transformer is also an E core or laminated stack having the central leg 35 with a pair of primary coils 36 and 37 which are arranged in parallel, the coil 36 having about twice the number of turns of coil 37. One end of each of the coils 36 and 37 are connected to a lead 38 which connects with the house side of the toggle double pole switch 40. The other end of the coil 36 connects with one end of the coil of the relay 38 and the other end of the relay coil leads to house side of the switch 40. The outer end of the outer winding 37 connects with the relay stationary contact point 39. The other end of the outer coil is connected to the wire 33. The other contact point 41 of the relay is supported by the spring arm 42, this arm 42 being sprung to automatically open contacts 39 and 41 when the relay coil is not fully energized. The arm is fixed to a side wall of the cavity 14 and is made of spring steel. The point 41 connects with a curled flexible wire 43 that connects with wire 44 through the thermostat 45. This thermostat operates to cut out coil 37 when the temperature of the chamber 14 becomes too hot or rises above a predetermined temperature, which is a temperature regulation means for the hand iron. This thermostat may be placed in contact with the plate 10 if desired. The double pole switch is connected to a source of suitable electric current by the insulated wires 48 and 49.

The outer legs 49 and 50 of the E core have a closed winding of few turns 51 and 52 respectively which shade these poles and aid in the removal of the iron from the plate 10. These shading poles substantially remove alternating current chatter and noise between the iron 1 and plate 10. The high reluctance bridge pieces 53 and 54 with insulating gap pieces 55 are provided between the tops of the outer transformer legs and the central leg to maintain a shortened path of weak flux when the primary relay switch is open so that the main flux will quickly build up when the iron is placed on the stand 10.

When the hand iron is lifted by the handle 4, the bar 30 opens the secondary circuit which in turn reduces the current in the primary circuits. This drop in current in the low-current coil 36 occurs also in solenoid 38 (which is in series therewith) and causes opening of switch 38-39, thus breaking the circuit of the high-current primary coil 37. The flux due to coil 37 thus drops to zero, making it much easier to remove the hand iron from the stand or plate 10. This hand iron form of the invention is designed for the usual house lighting 60 cycle circuit of 115 volts; the coil 37 being designed to carry 6 amps., the coil 36 about 1/2 amp., and the coil 19 to provide about 600 watts to the heating element 7.

In Fig. 4 of the drawings, is shown a table top 57 having installed therein spaced apart primary units 13. Over one of the primary units is a percolator 58, over another unit a toaster 59, and over still another unit a grill 60. Each one of

the portable appliances, percolator, toaster and grill, has a secondary unit 15 which supplies the current to the heating element and/or elements of the appliance.

Fig. 5 shows a liquid mixer 61 for drinks and the like resting upon the table top 62 and which have the matched transformer units 13 and 15 for supplying current to operate the motor 63 of the mixer.

Fig. 6 shows a bench top 64 with a power motor 65 mounted thereon, the motor having a grinding stone 66 and a saw blade or wheel 67 on the shaft thereof and a transformer unit 15 and the bench a transformer unit 13. Obviously, the invention can readily be applied to all kinds of portable electric appliances including table and floor lamps, vacuum cleaners, room heaters, etc.

Having thus described my invention, what is claimed as new and desired to be secured by Letters Patent is:

1. An electrical ironing device comprising an appliance with a handle having a switch therein and a stationary current supply station adapted to be placed near where the appliance is to be used, the appliance and the station having complementary transformer parts adapted to be substantially aligned for interchange of energy, each transformer part including a core stack with a coil thereon, a heating element in the appliance, the coil of the appliance having connection with the element for supplying it with electrical energy, the coil of the station having connection with a source of current supply, current breaker means in the station to materially reduce the flux in its core stack, the current breaker means being operated by current drop in the coil of the station when the switch of the handle is opened by lifting the handle.

2. An electrical ironing board device comprising an ironing appliance and a supply station for energizing the appliance, depressed means for positioning the appliance over the supply station, the appliance and the station having complementary parts of a transformer which are properly aligned by said depressed means, the complementary parts of the transformer each including a core with a coil thereon, the coil of one core being connected to the current utilization portion of the appliance and the coil of the other core having connection with a source of current supply, current breaker means in the station to materially reduce the flux in its core, secondary-current-reducing means in the iron manually operable upon grasping the appliance for its removal from the station, the breaker means including a relay coil with breaker points, and the station coil comprising a double coil in parallel with each other but one of these coils having a series relation with the relay coil, the relay coil operating the breaker points to cause current to pass into the other of the parallel coils when the flux through the relay coil is at a predetermined density.

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