

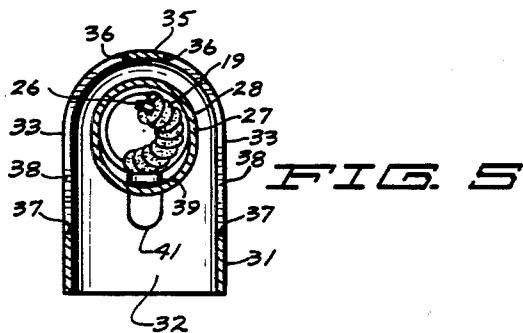
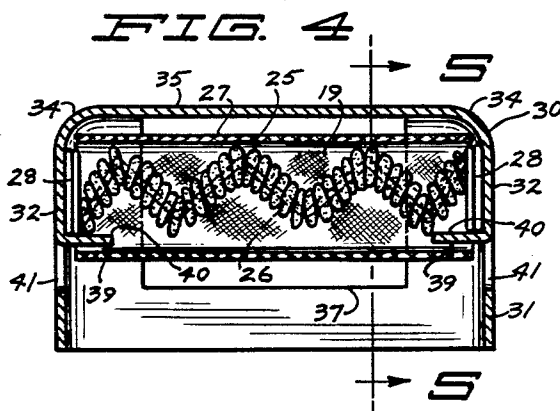
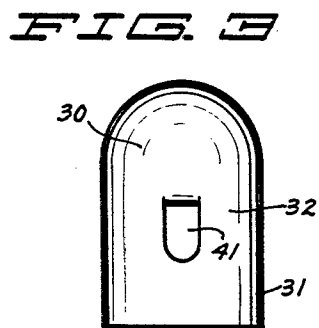
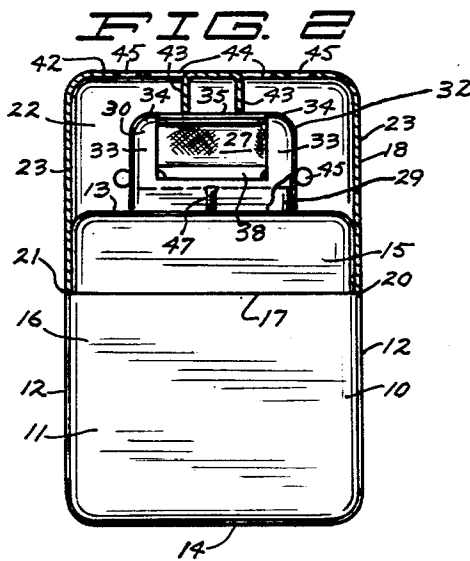
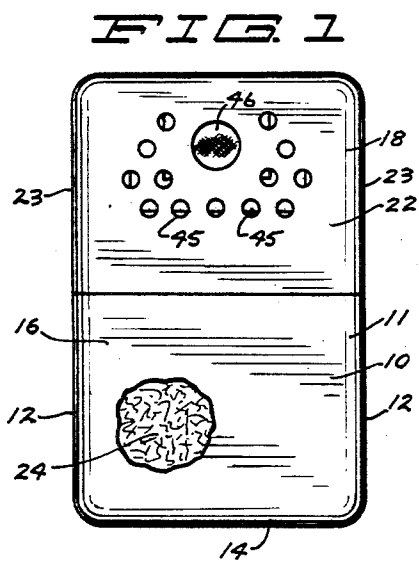
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HAND WARMER

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2,942,601

HAND WARMER

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1 Claim. (Cl. 126—208)

This application is a continuation-in-part of my abandoned applications Serial No. 352,609, filed May 4, 1953; Serial No. 503,533, filed April 25, 1955; Serial No. 575,457, filed April 2, 1956; and Serial No. 651,497, filed April 8, 1957; each for a hand warmer.

The object of the invention is to provide a hand warmer of the general character as disclosed in the above identified applications including a new and improved burner unit seated in a holder of the hand warmer in novel and improved manner.

In the accompanying drawing forming a part of this specification,

Fig. 1 is a side elevational view, partially broken away of a hand warmer made according to the invention;

Fig. 2 is a side elevational view of the hand warmer disclosing a cover cap for a burner unit of said hand warmer in section;

Fig. 3 is an end elevational view of a holder for the burner unit as when removed from the remainder of the hand warmer;

Fig. 4 is an enlarged sectional view detailing features of the holder and burner unit; and

Fig. 5 is a sectional view, taken on line 5—5 in Fig. 4.

A receptacle 10 of the hand warmer is provided by spaced, parallel side walls 11, spaced, parallel end walls 12 and spaced, substantially parallel top and bottom walls, denoted 13 and 14, respectively. The receptacle consists of upper and lower hollow elements, represented 15 and 16, respectively, a lower end portion of said upper hollow element being fixedly secured as at 17, in an upper end portion of said lower hollow element.

A cover cap 18 for a burner unit 19 of the hand warmer is removably fitted upon the upper end portions of the side and end walls 11 and 12 of the receptacle in such manner that a lower edge 20 of said cover cap is engaged against an upper edge 21 of the lower hollow element 16. When the cover cap is in position upon the receptacle, side and end walls, represented 22 and 23, respectively, of said cover cap are in longitudinal alinement with lower portions of the side and end walls of said receptacle.

The receptacle 10 is loaded with absorbent material 24, which can be of any character suitable to its purpose, and said absorbent material is impregnated with liquid fuel uniformly distributed throughout the whole of the absorbent material by capillary attraction.

The burner unit 19 consists of an elongated combustion member 25, an elongated support 26 for the combustion member and a tubular combustion element 27 housing said combustion member and support.

The elongated combustion member 25 is of asbestos or other suitable fibrous material impregnated with a catalytic agent, such, for example, as platinum chlorid or palladium chlorid, which aids in oxidation of fumes from the liquid fuel and causes combustion at a relatively slow rate.

The elongated support 26 is a length of wire having some rigidity coiled to form spaced convolutions upon

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which the elongated combustion member 25 is wound. Opposite coiled end portions, each indicated 28, of said elongated support are disposed in longitudinal alinement with the elongated combustion member at and exteriorly of the opposite ends of said elongated combustion member, and coils of said opposite end portions of the elongated support extend transversely of the burner unit 19 and are of equal diameter. The coils of the opposite end portions 28 of said elongated support are in longitudinally alined relation with the body thereof, as well as longitudinally alined with the elongated combustion member 25.

The tubular combustion element 27 desirably may be of spun glass impregnated with a catalytic agent. In the disclosure as made, the catalytic agent which impregnates the spun glass of the tubular combustion element is platinum black, so-called. The catalytic agent of the tubular combustion element aids in oxidation of fumes and causes relatively slow combustion. Said tubular combustion element is in free surrounding relation to the elongated support 26 and the elongated combustion member 25 wound thereon, and the body of said elongated support, said elongated combustion member and said tubular combustion element are of substantially equal length. The opposite ends of said body of the elongated support are substantially in transverse alinement with the opposite ends of the tubular combustion element, and the coiled end portions, or coils, 28 extend or project to desirably equal distances beyond the opposite ends, respectively, of the body of said elongated support and said tubular combustion element.

The top wall 13 of the receptacle 10 is struck upwardly at the center thereof to provide an upwardly extending, substantially elliptical flange 29 bounding an elliptical opening through said top wall and upwardly extending, elliptical flange.

A holder 30 for the burner unit 19 is constituted as an elongated hood providing an elliptical skirt 31 removably, more or less loosely, fitted upon the upwardly extending, elliptical flange 29 to be readily and easily detachable therefrom, and oppositely disposed, inwardly facing, parallel arms 32 extending upwardly from said elliptical skirt in perpendicular relation thereto. Each of the parallel, upstanding arms 32 merges at each of the opposite sides thereof in an inwardly extending, curved flange 33 in perpendicular relation to the elliptical skirt 31 and at its upper end in an inwardly extending curved flange 34. The inwardly extending, curved flanges 34 are integrally interconnected by a longitudinally extending bar 35 which is disposed at the longitudinal center of the holder 30 and extends between the inner edges of said inwardly extending, curved flanges. The inner edges of the curved flanges 33 at each end of the holder are in the same transverse plane and parallel with and in spaced relation to the upwardly extending arm 32 at the corresponding end of said holder, as well as perpendicular to the elliptical skirt 31.

The inner edges of the curved flanges 33 at each side of the holder 30, together with an adjacent straight side edge 36 of the longitudinal bar 35 and an adjacent straight upper edge 37 of the elliptical skirt 31 at the corresponding side of said holder, bound or define a rectangular opening 38 at the same side of said holder of width substantially the same as, or somewhat greater than, the diameter of the tubular combustion element 27 and of length approaching the length of said tubular combustion element. The curved flanges 33 at each end of the holder are spaced apart a distance slightly greater than the diameter of the burner unit, the curved flanges 34 and the longitudinal bar 35 are spaced from the elliptical skirt 31 a distance slightly greater than the diameter of said burner unit, and the inner edges of the curved flanges

33 at opposite ends of said holder as shown are spaced apart a distance less than the length of the tubular combustion element of the burner unit.

Each of the parallel, upwardly extending arms 32 of the holder is struck inwardly and upwardly to provide a lug 39 at a midportion of the length of the corresponding upwardly extending arm including an upwardly facing supporting surface 40 for the burner unit 19. The supporting surfaces 40 are situated interiorly of and in aligned relation between the parallel, upwardly extending arms 32, in a plane parallel with the longitudinal bar 35 and perpendicular to said upwardly extending arms and spaced from the inwardly extending curved flanges 34 a distance but a trifle greater than a measurement representing the diameter of each of the coiled end portions, or coils, 28 of the elongated support 26. The lug 39 at each end of the holder is in vertical alinement with the curved flange 34 at the corresponding end of said holder. Striking the lugs 39 inwardly and upwardly from the parallel, upwardly extending arms 32 also provides an aperture 41 through each of said arms for passage of combustion sustaining atmospheric air to the burner unit 19.

The burner unit, constituted as the elongated combustion member 25, the elongated support 26 including the coiled end portions, or coils, 28, and the tubular combustion element 27, is disposed within the holder and assembled therewith before the elliptical skirt 31 of the holder is assembled with the upwardly extending, elliptical flange 29. To accomplish assembly of the burner unit with the holder said burner unit is slid into the open lower end portion of the elliptical skirt and upwardly along the inner surfaces of the parallel, upwardly extending arms 32 until the coiled end portions, or coils, 28 of the elongated support 26 approach the elevation of the inwardly and upwardly struck lugs 39. Then said elongated support is collapsed longitudinally to be clear of the inner ends of said lugs and the burner unit is moved further upwardly until situated at elevation above the lugs. Or the elongated support 26 of the burner unit can be collapsed longitudinally to be shorter than a measurement representing the length of one of the rectangular openings 39 and made to enter the interior of the holder by way of said rectangular opening and seated at its proper and intended position in said holder. In the disclosure as made, the elongated support 26 is constituted as a compression coil spring. Each of the coiled end portions, or coils, 28 of said elongated support will be closely circumferentially surrounded by the inwardly extending, curved flanges 33, 34 and seated upon the inwardly and upwardly struck lug 39 at the corresponding end of the holder, and the elongated support will be under compression between the parallel, upwardly extending arms of said holder, as in Fig. 5 of the drawing, when the burner unit is in its assembled position. That is, each coiled end portion, or coil, 28 of said elongated support will be positively confined between the internal surfaces of the curved flanges 33, 34 and the upper surface 40 of the lug 39 at the same end of the holder when the burner unit and said holder are in assembled relation. The construction and arrangement will be such that approximately the whole of each of opposite sides of the tubular combustion element, adjacent the rectangular openings 38, will be uncovered.

A top wall 42 of the cover cap 18 is in parallel relation to the bottom wall 14 of the receptacle 10, as well as in spaced, parallel relation to the longitudinally extending bar 35 of the holder 30 when said cover cap is on said receptacle. Spaced, downwardly projecting tabs, each denoted 43, struck from the top wall of the cover cap to lie in perpendicular relation thereto, as well as in perpendicular relation to said longitudinal bar of said holder, will be seated against midportions of external surfaces of said longitudinal bar, as in Fig. 2 of the drawing, when the lower edge 20 of said cover cap is engaged against the upper edge 21 of the lower hollow element 16 of the receptacle 10. Striking of the tabs 43 from the

top wall 42 of the cover cap provides apertures 44 for passage of atmospheric air to the burner unit. Apertures 45 in the side walls 11 and top wall 42 of the cover cap also are for the admission of atmospheric air.

An opening 46 in the cover cap, adjacent to a midportion of the rectangular opening 38 in the holder 30 and in contiguous relation to a midportion of the tubular combustion element 27 when the receptacle 10, said holder, the burner unit 19 and said cover cap are assembled, is for reception of an end portion of a cigarette or cigar to be ignited by employment of the hand warmer.

A wick 47, by employment of which the burner unit can be ignited, extends upwardly from a position where imbedded in the absorbent material 24 to a position where in contiguous relation to said burner unit.

A volatile liquid fuel will be poured into the receptacle 10 through the elliptical opening in the upstanding flange 29 while the holder 30 and the burner unit 19 retained thereby are removed from said upwardly extending flange. The absorbent material 24 will absorb the liquid fuel and capillary attraction will cause it to be dispersed throughout said absorbent material. The holder 30 will be placed upon the upwardly extending elliptical flange 29 after the receptacle is supplied with liquid fuel, and heat applied to the burner unit, as by a flame provided at the wick 47 when ignited, will cause combustion to be initiated. Of course, the cover cap 18 will be removed while the burner unit is being lighted, and replaced upon said receptacle after combustion is established. The flame at the wick 47 will be extinguished after ignition of the burner unit, and when said burner unit becomes ignited, combustion thereat will be continuously sustained. The catalytic agent formed upon or within the elongated combustion member 25 and the tubular combustion element 27 will assist in maintaining combustion as long as there is fuel in the absorbent material 24. Both said elongated combustion member and said tubular combustion element will glow. No flame will be produced. Heat created at the burner unit will be imparted to the cover cap 18, as well as to the receptacle 10, and said cover cap and receptacle will become warmed to give off heat at a predeterminedly intended temperature suitable to the purposes of the hand warmer. The cover cap will continuously conduct heat from the vicinity of the wick sufficient in amount to preclude the wick after extinguished from becoming re-ignited.

The parallel, upwardly extending arms 32 and the inwardly and upwardly struck lugs 39 will retain the elongated support 26 and the coiled end portions, or coils, 28 thereof in proper and intended position in the holder 30, as well as retain the burner unit 19 and the tubular combustion element 27 thereof in adjacent relation to the opening 46 for reception of the end portions of cigarettes and cigars. Said tubular combustion element and the catalytic agent thereon, or impregnated therein, will retain glowing heat at temperature sufficiently high to cause a cigarette or cigar, placed in the opening 46 and made to contact the tubular combustion element while operative, to become readily and easily ignited.

Proper spacing between the burner unit 19 and the absorbent material 24 is necessary. Otherwise, the catalytic action will cease.

The elliptical skirt 31 of the holder 30 will be more or less loosely assembled with the upward extending, elliptical flange 29 on the receptacle 10 in order that the holder 30 with burner unit 19 can be readily and easily displaced from said receptacle. Removal of the holder with burner unit from the receptacle will result in the burner unit becoming extinguished.

A hand warmer of the kind as herein presented is of necessity subjected to severe usage. The holder with burner unit suffers a fall, with consequent shock tending to displace the burner unit from the holder, each time knocked off of the receptacle thus to cause said burner unit to become extinguished. And, too, the burner unit will become extinguished, or fail to ignite,

if it becomes displaced from its proper and intended spaced position relative to the fuel outlet. It is essential both that the burner unit 19 be fixedly seated in the holder 30 in order that it will not become displaced during practical use of the hand warmer, or when the holder with burner unit is knocked off from the receptacle 10, and that said holder be fixedly positioned upon said receptacle while the hand warmer is in use, as well as loosely assembled with the receptacle to be readily and easily displaceable therefrom. The holder 30, assembled with the burner unit 19 in the manner as hereinbefore set forth, stationarily retains said burner unit in said holder and the construction and arrangement are such that when the cover cap 18 is applied to the receptacle 10, with the lower edge 20 of said cover cap engaged against the upper edge 21 of the lower hollow element 16 of said receptacle, the side and end walls 22 and 23 of the cover cap will be removably fitted upon upper portions of the side and end walls 11 and 12, respectively, of the receptacle sufficiently tightly to preclude relative movement of said cover cap and receptacle during practical use of the hand warmer. That is, the cover cap and the receptacle will be fitted together much more tightly than will be the elliptical skirt 31 of the holder 30 and the upwardly extending, elliptical flange 29 on said receptacle. The spaced, downwardly projecting tabs 43 on the top wall 42 of the cover cap, seated against midportions of the upper external surface of the longitudinal bar 35 when the cover cap and receptacle are assembled, are for maintaining the holder in fixed relation to said receptacle. The holder offers no obstruction to efficient combustion.

The simply and economically constructed device of the invention is, in fact, a combination hand warmer

and lighter. The device will be operative for hours upon a single filling of the receptacle with liquid fuel. The temperature will be a function of the amount of air permitted to contact the burner unit.

5 What is claimed is:

In a hand warmer, a holder including spaced, oppositely disposed arms in facing relation, ledges struck inwardly from said spaced arms providing spaced, oppositely disposed supporting surfaces contiguous with inner surfaces of the spaced arms at a side of said ledges, and a burner unit constituted as an elongated support, an elongated combustion member wound thereon and a tubular combustion element housing said combustion member and elongated support and situated between said spaced arms, the elongated support including coiled end portions projecting beyond opposite ends, respectively, of a body thereof, the elongated combustion member and the tubular combustion element, said coiled end portions of said elongated support being in parallel relation to the spaced arms, peripheral surfaces of the coiled end portions being seated on said supporting surfaces, respectively, and outermost flat surfaces of said coiled end portions being resiliently engaged against inner surfaces, respectively, of said spaced arms.

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