

Oct. 6, 1959

T. ISHAM
REFRIGERATOR

2,907,185

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FIG. 1.

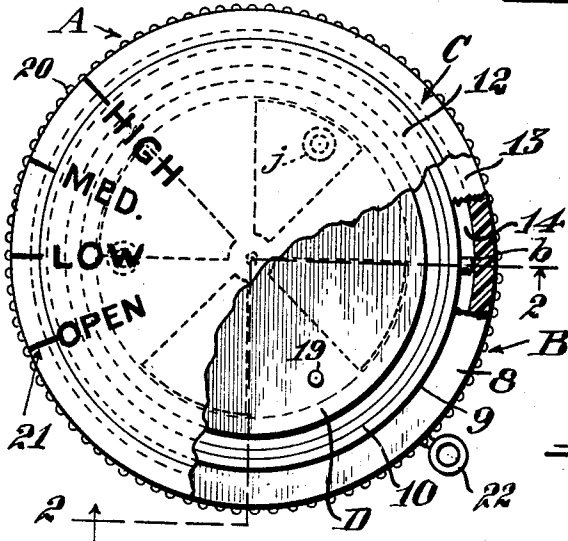


FIG. 4.

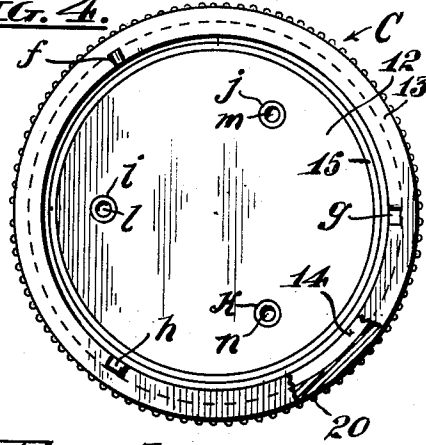


FIG. 5.

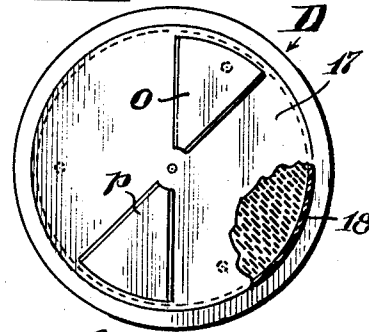


FIG. 2.

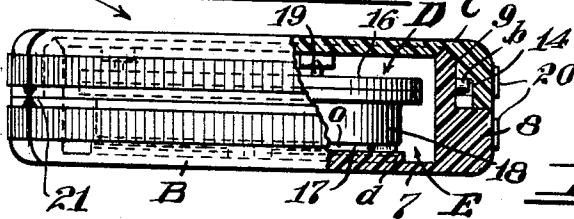


FIG. 6.

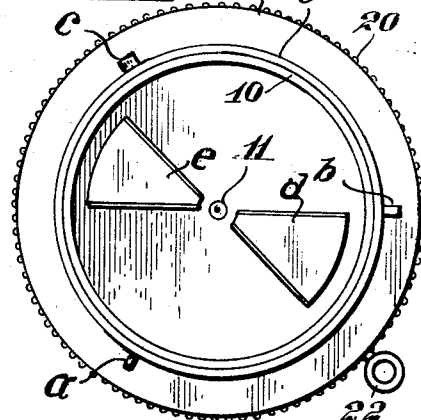
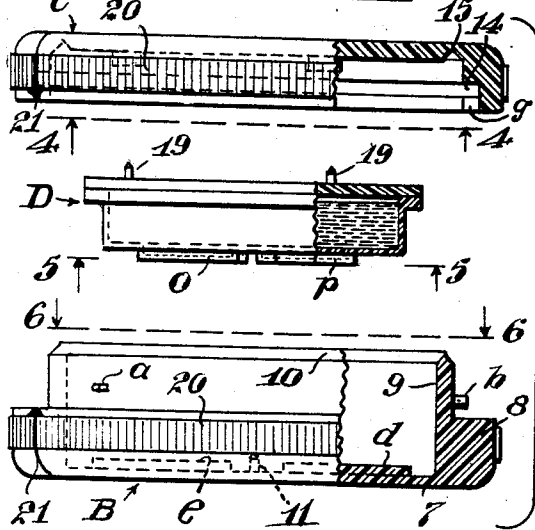


FIG. 3.



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2,907,185

REFRIGERATOR

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2 Claims. (Cl. 62—383)

This invention relates to a refrigerator and has as its primary object the provision of a device whereby cold may be dispensed at the will of an operator.

Another object is to provide a device of the above character embodying means whereby the dispensed cold may be varied in temperature within the range or capacity of the refrigerator from minimum to maximum.

Another object is to provide a refrigerator which while being adaptable to various uses and applications may be designed so that it can be carried on the person and may be applied to various portions of the anatomy and set in operation to effect a cooling action on the blood stream as needed and accordingly is highly advantageous for use by persons being subjected to distressingly high atmospheric temperatures.

The invention resides generally in the provision of a cold element comprising a sealed vessel containing a cold substance together with a housing encompassing the element in spaced and insulated relation thereto in which controlled means are provided for disposing the element and housing in conductive relation to each other such that cold will be transmitted from the element to the housing thereby reducing the temperature of the latter.

The mode of carrying the invention into effect is illustrated by way of example in the accompanying drawings depicting a particular application of the invention, in which:

Fig. 1 is a plan view of the device with portions broken away;

Fig. 2 is a view in side elevation partly in cross section as seen on the line 2—2 of Fig. 1;

Fig. 3 is an exploded view of the assemblage shown in Fig. 2;

Fig. 4 is an inverted plan view taken on the line 4—4 of Fig. 3;

Fig. 5 is an inverted plan view taken on the line 5—5 of Fig. 3; and

Fig. 6 is a plan view taken on the line 6—6 of Fig. 3.

Referring to the drawings more specifically A indicates generally a cylindrical housing embodying a base B and a cap C which are interconnected in axial revoluble relation to each other and enclose a dead air chamber E. The base B comprises a circular floor 7 having an upstanding marginal wall 8 terminating in an inset upstanding flange 9 having a tapered upper margin 10.

Carried on the outer perimeter of the flange 9 is a series of three equi-spaced outwardly projecting cylindrical lugs *a—b* and *c* of various relative diameters for effecting slidable interlocking connection with the cap C as will presently be described. The floor 7 has on its upper face a pair of diametrically opposed flat faced raised triangular portions *d* and *e* with their side margins extending radially from the center of the floor at an angle of 45° relative to each other, which floor portions *d—e* constitute contact areas as will later appear. An upstanding tapered pin 11 is disposed centrally of the floor 7 which pin projects a short distance above the

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upper faces of the raised floor portions *d—e*, the purpose of which will be described hereinafter.

The cap C comprises a circular top wall 12 having a downwardly extending flange or side wall 13 the inner periphery of which has a continuous channel 14 adjacent to and paralleling the margin of the wall 13, which channel 14 is provided for the reception of the lugs *a—b* and *c* in sliding engagement therewith. The inner periphery of the wall 13 is designed to slidably conform to the outer periphery of the flange 9 and accordingly as a means for enabling positioning of the lugs *a—b* and *c* in the channel 14 the margin of the wall 13 has therein a series of three slots *f—g* and *h* of various widths complementary to the widths of the lugs *a—b* and *c* so as to slidably receive the latter and permit their passage to the channel 14. Manifestly it is necessary to position the lugs *a—b—c* opposite the slots *f—g—h* of widths corresponding to the various widths at the lugs *a—b—c* in order to effect assemblage of the cap C on the base B.

The wall 12 has an annular channel 15 of V-cross section arranged at the base of the inner periphery of the side wall 13 to slidably receive the tapered margin 10 of the flange 9 when the cap C and base B are assembled, and projecting from the underside of the top wall 12 is a series of three bosses *i—j* and *k* having recesses *l*, *m* and *n* in the ends thereof for a purpose to be later set forth.

The housing A is designed to receive a removable and replaceable cold element D which is here shown as comprising a sealed disk-shaped vessel having parallel flat top and bottom walls 16—17 respectively and a connecting annular side wall 18 which vessel is loaded with a cold holding substance such as calcium chloride jelly or any other suitable cold emitting material adapted to be charged with cold by subjecting to refrigeration and to slowly dissipate the cold under heat exchange conditions. The underside of the bottom wall 17 of the element D has thereon a pair of diametrically opposed spaced apart triangular shaped raised portions *o* and *p* having their side margins extending in radial relation to the axis of the wall 17 at an angle of 45° relative to each other. The element D is designed to be positioned in the housing A, with its bottom wall 17 seated at its center on the tip of the pin 11 and with the projections *o* and *p* thereon normally projecting slightly between the projecting portions *d—e* on the housing bottom wall 7 with the radial margins of the projections *o—p* spaced laterally from the radial margins of the raised portions *d—e*.

A series of tapered pins 19 outwardly project from the top wall 16 for seating engagement at their pointed ends on the bottoms of the recesses *l*, *m* and *n* and serve to laterally interlock the cap C and element D and also to space the top walls 12 and 16 thereof apart and to center the element D relative to the cap. The element D is of an outside diameter less than the inside diameter of the wall 8 and flange 9 so as to be spaced therefrom.

It will be seen from the foregoing that the cold element D when assembled in the housing A is supported in the latter with its walls spaced from the walls of the housing and substantially completely surrounded by a body of dead air contained in the housing which air body continues insulation against rapid dissipation of cold from the element D, the only contact between the element D and the housing A being that afforded by the pointed ends of the pins 11 and 19 which contact is so minute as to be negligible in permitting passage through of cold from the element D and of heat from the housing A. What little exchange of heat and cold as may normally occur between the element D and housing A will be so slow that a considerable time will be required to effect appreciable diminution of the cold held by the element D.

In order to facilitate the operation of the device in dispensing cold, the walls of the base B and cap C of the housing A and also the walls of the element D are preferably formed of a conductive plastic such as polyethylene or nylon but any other suitable material capable of transmitting heat and cold may be employed, and also in order to enable effecting intimate contact between wall portions of the element and housing when it is desired to dispense cold at least the bottom wall 7 is capable of being flexed and the edges of the radial margins of the contact members or projections *o-p* and portions *d-e* are rounded or beveled so that on rotating the base B and cap C relative to each other the projections *o-p* may readily ride onto the portions *d-e* into superficial contact therewith.

To facilitate rotation of the base B and cap C relative to each other the outer perimeters of the side walls 8 and 13 thereof are milled as indicated at 20 and as a means for indicating to the operator the relative "on and off" positions and extent of overlap of the contact members *o-p* and *d-e* the adjacent exterior margins of the walls 8 and 13 and top wall 12 are formed with an appropriately designated index 21.

As a means for enabling suspending the device it may be equipped with an eyelet 22 here shown as affixed to the side wall 8 to which eyelet a ribbon or cord may be attached.

In the operation of the invention, the cold element D is assembled on the inverted cover C with the pins 19 seated in the depressions *l*, *m* and *n*; the base B is then inverted over the cold element D and engaged with the cover C by passing the lugs *a*, *b* and *c* through the appropriate slots *f-g* and *h* and into engagement with the channel 14 on imparting a slight relative turning movement to the base B and cap C. The tapered margins 10 of the flange 9 on the base B will then snugly seat in the V-channel 15 on the cap C to thereby hermetically seal the chamber encompassed by the housing and thereby form the requisite dead air body between the housing A and the cold element D therein and thus preventing or at least minimizing the exchange of heat and cold between the housing A and cold element D. When it is desired to effect such heat and cold exchange and thereby transmit cold from the cold element D to the walls of the housing A, assuming that the element D is charged with cold at a temperature exceeding that of the housing A, the base B and cap C are turned relative to each other on their axis so as to bring the beveled edges of the adjacent radial margins of the contact members *d-e* and *o-p* into abutting relation to each other which position will be designated by the index 21 as "low" denoting the conditioning of the device for the minor degree of cold emanations from the cold element D to the housing A. To effect a greater degree of cold emanations continued relative turning of the base B and cap C is effected to cause the members *o-p* to advance onto the members *d-e*, for example half way thereacross which position will be designated by the index 21 as "medium" denoting conditioning of the device for a medium cold discharge operation. On further turning of the base B and cap C the members *o-p* may be disposed to overlie the members *d-e* in register therewith where the index will then denote "high" to indicate the device as conditioned to effect its maximum rate of cold discharge. The floor 7 of the base B being capable of being flexed the projections *o-p* which extend below the plane of the contact portions *d-e* may readily ride onto the latter into surface contact therewith. Manifestly the relative adjustment of base B and cap C may be made to effect any desired extent of overlap of the contact members *o-p* and *d-e* thus affording a variable degree of discharge from the cold elements D ranging from minimum to maximum, it being obvious that the rapidity of cold exchange

is determined by the extent of the surface contact between the contact members. While emanation of cold from the element D will effect a cooling action on the body of air confined in the chamber E of the housing A such that temperature exchange will occur between the housing and the element D, such exchange will be negligible since the air body is a poor temperature conductor, at least such that considerable time will be required to effect dissipation of cold from the element D through the air body.

On the other hand the material forming the walls of the element D and housing A and the integral contact portions *o-p* and *d-e* is more highly temperature conductive than that of the air body such that temperature exchange will be augmented on bringing the contacts *o-p* and *d-e* into engagement with each other which exchange will be varied according to variation in the extent of the abutting areas of the opposed contacts as above described.

On cold being dissipated from the element D it may be removed and revitalized by subjecting it to a refrigerating action and then replaced in the housing A or the depleted element may be replaced by an active cold element.

It has been found in practice that the device is capable of delivering cold for a protracted period of time with a single loading thereof. Extension of such period is accomplished by reloading with an active cold element and accordingly by having on hand a number of the active cold elements D the device can be kept in operation for a considerable length of time. For such purpose a supply of the cold elements D may be kept on hand in a suitable refrigerating compartment or in a protective container for use in the device as needed.

The device as here shown is especially suitable for use in lowering an excessive body temperature as by imposing it on the skin of a suitable portion of the body. It is manifest however that the device is applicable for use in various situations where the application and presence of cold is desirable, and particularly where cold of a predetermined or variable temperature is required.

While a specific embodiment of the invention has been shown and described, the invention is not limited to the exact details of construction set forth, and the invention embraces such changes, modifications and equivalents of the parts and their formation and arrangement as come within the purview of the appended claims, it being manifest for example, that while the device is shown as embodying a pair of contact members on the housing A and cold holding element D such number may be increased or diminished since a single contact member or a multiple of such members may be employed without departing from the spirit of the invention and not necessary to be here shown.

I claim:

1. In a refrigerating device, a cylindrical housing having interconnected bottom and cap members enclosing a dead air space, said members being revoluble relative to each other; a cold holding and dispensing element in and surrounded by said dead air space, pointed pins extending between said housing and element supporting the latter within said housing, co-operating contact members carried by said element and said housing mounted and arranged to be moved in and out of engagement on rotating said housing members relative to each other; said contact members comprising raised portions on said housing and on said element adapted to be disposed in variable overlapped surface contact with each other.

2. In a refrigerating device, a cylindrical housing having interconnected bottom and cap members enclosing a dead air space, said members being revoluble relative to each other; a cold holding and dispensing element in and surrounded by said dead air space, pointed pins extending between said housing and element supporting the latter within said housing, co-operating contact members carried by said element and said housing mounted and

arranged to be moved in and out of engagement on rotating said housing members relative to each other; said contact members comprising raised portions on said housing and element adapted to be disposed in variable overlapped surface contact with each other, and index means on said housing for indicating the relative positions of said contact members.

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References Cited in the file of this patent

UNITED STATES PATENTS

1,941,173	Lark-Horovitz	Dec. 26, 1933
2,039,817	MacMillan	May 5, 1936
2,707,870	Edmonson	May 10, 1955