

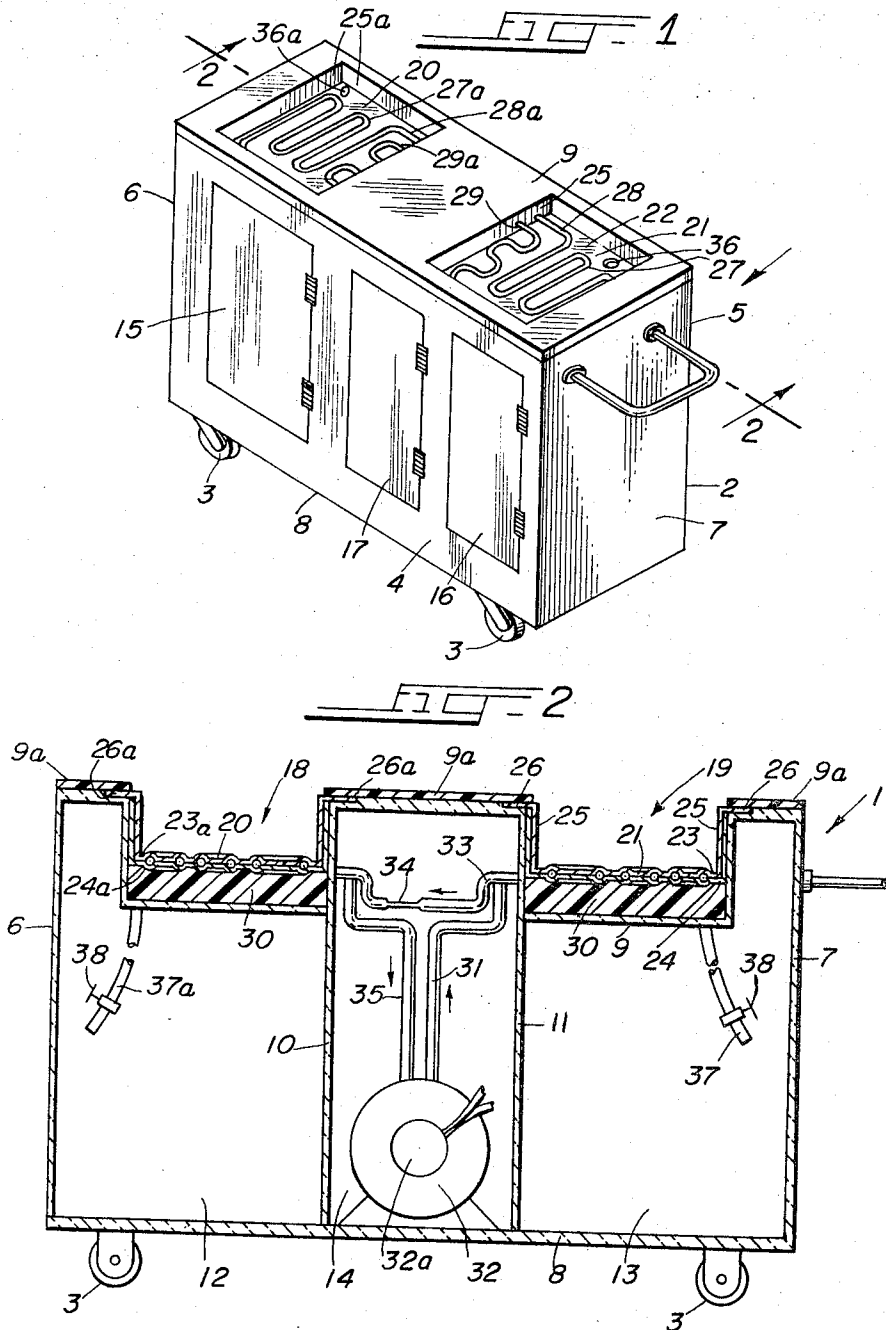
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HEATING AND COOLING REFRIGERATION SYSTEM

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HEATING AND COOLING REFRIGERATION SYSTEM

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8 Claims. (Cl. 62-239)

This invention relates to furniture and, more particularly, to furniture which is particularly well adapted for use as a serving table, or the like.

It is a primary object of the present invention to afford a novel article of furniture.

Another object is to afford a novel article of furniture for storing food, beverages and the like, in a novel and expeditious manner.

An object ancillary to the foregoing is to enable such food, beverages, and the like to be stored in a readily accessible manner.

Yet another object is to afford a novel article of furniture of the aforementioned type which is particularly well adapted for use as a patio cart or patio table, and the like.

A further object is to afford a novel article of furniture for cooling food which it is desired to keep cool and warming foods which it is desired to keep warm.

Another object of the present invention is to afford a novel article of furniture which may be used simultaneously as a serving table for both warm and cold foods, and wherein the parts thereof are constituted and arranged in a novel and expeditious manner effective to heat the foods it is desired to keep warm and to cool the foods it is desired to keep cool.

Another object is to afford a novel article of furniture of the aforementioned type wherein simultaneous heating and cooling of respective foods, beverages, and the like, may be accomplished in a novel and expeditious manner by a novel refrigeration unit.

A further object is to afford a novel article of furniture of the aforementioned type which is practical and efficient in operation, and which may be readily and economically produced commercially.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings, which, by way of illustration, show a preferred embodiment of the present invention and the principles thereof and what I now consider to be the best mode in which I have contemplated applying these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

FIG. 1 is a front perspective view of an article of furniture embodying the principles of the present invention; and

FIG. 2 is a longitudinal sectional view taken substantially along the line 2-2 in FIG. 1, with certain parts thereof shown more or less diagrammatically.

A serving table in the form of a portable cart 1, and embodying the principles of the present invention, is shown in the drawings to illustrate the preferred embodiment of the present invention.

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The cart 1 embodies, in general, a body portion 2 movably supported by wheels 3 mounted on the bottom thereof, the cart 1 affording a serving table which is particularly well adapted for use on patios, and the like.

The body portion 2 is substantially rectangular in shape, and includes a front wall 4, a rear wall 5, two oppositely disposed end walls 6 and 7, a bottom wall 8 and a top wall 9. The top wall 9 affords a horizontally extending, substantially rectangular-shaped table top. Two partition walls 10 and 11, disposed in spaced parallel relation to each other and to the end walls 6 and 7 divide the interior of the body portion 2 into two end compartments 12 and 13, and a central compartment 14, FIG. 2. Three doors 15, 16, and 17 are hinged in the front wall 4 to afford access to the compartments 12-14, respectively, from the front of the cart 1. The top wall 9 has two recesses 18 and 19 affording cooling wells and warming wells, respectively, as will be discussed in greater detail presently.

The walls 4-11 of the body portion 2 may be made of any suitable material, such as, for example, wood, and the upper face of the top wall 9 between, and outwardly of, the recesses 18 and 19 is preferably covered by a flat cover member 9a such as, for example, a suitable stain resistant plastic sheet material, adhesively secured thereto.

A cooling unit in the form of a tube sheet type of evaporator 20 is mounted in the recess 18, and a heating or warming unit in the form of a tube sheet type of condenser 21 is mounted in the recess 19.

The condenser 21 includes a substantially square panel 22 which embodies two plys or sheet members 23 and 24 secured together in face-to-face relationship to each other. The outer peripheral edge portions of the sheet members 23 and 24, throughout the periphery of the panel 22 preferably project vertically upwardly from the panel 22 to afford side flanges 25, the upper edge portions of the side flanges 25 preferably terminating in horizontally outwardly projecting supporting flanges for a purpose which will be discussed in greater detail presently.

An elongated passageway affording a coil 27 is formed in the panel 22 between the sheet members 23 and 24 for feeding working fluid, such as, for example, a refrigerant through the panel 22, the coil 27 winding through a tortuous path, extending from an inlet end 28 to an outlet end 29, FIG. 1, terminating at the junction of the panel 22 with one of the side flanges 25.

The evaporator 20 is identical in construction to the condenser 21, and the parts thereof are indicated by the same reference numerals as the corresponding parts of the condenser 21, with the suffix a added thereto.

The evaporator 20 and the condenser 21 are disposed in the recesses 18 and 19, respectively, with the supporting flanges 26a and 26 thereof, respectively, disposed in recesses formed in the adjacent, respective horizontally extending portions of the top wall 9. The upper faces of the supporting flanges 26a and 26 are preferably disposed in uniplanar relation to the adjacent portions of the top wall 9, and the cover member 9a is preferably disposed on top of the supporting flanges 26a and 26 in covering relation thereto, FIG. 2. Suitable heat insulating material, such as, for example, cork, or a suitable plastic material, is disposed between the evaporator 20 and the condenser 21 and the portions of the top wall 9 disposed immediately therebelow, so as to prevent substantial ex-

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change of heat between the heat exchangers 20 and 21 and the interior of the body portion 2 of the cart 1.

The condenser 21 is so disposed in the recess 19 that the end portions 28 and 29 of the coil 27 are disposed adjacent to the partition wall 11 of the body portion 2; and the evaporator 20 is so disposed in the recess 18 that the end portions 28a and 29a of the coil 27a are disposed adjacent to the partition wall 10 in the body portion 2. The inlet 28 of the coil 27 of the condenser 21 is connected by a suitable conduit 31 to the outlet of a compressor 32 mounted in the compartment 14 of the body portion 2, the conduit 31 extending through the partition wall 11 and being connected to the inlet 28. The outlet 29 of the coil 27 of the condenser 21 is connected by a suitable conduit 33, having a capillary tube portion 34 therein, to the inlet 28a of the coil 27a of the evaporator 20, the conduit 33 extending through the partition walls 10 and 11. The outlet 29a of the coil 27a of the evaporator 20 is connected by a suitable conduit 35 to the inlet of the compressor 32, the conduit 35 extending through the partition wall 10.

The capillary tube portion 34 of the conduit 33 is preferably disposed in parallel, tight abutting engagement with the conduit 35 to thereby afford good heat exchange relationship therebetween. This renders the refrigerant in the capillary tube section 34 responsive to the temperature in the conduit 35 through which the refrigerant flows from the evaporator 20 to the compressor 32, to thereby vary the rate of the flow of refrigerant to the evaporator 20 responsively to the temperature of the refrigerant in the suction line or inlet conduit 35 of the compressor 32.

The compressor 32 may be driven by any suitable type of driving mechanism, such as, for example, an electric motor 32a operatively connected thereto, and the motor 32a may be operatively connected to any suitable source of electric power, such as, for example, one of the usual wall sockets found in residences, and the like.

Preferably, each of the panels 22a and 22 of the evaporator 20 and the condenser 21, respectively, have a drain opening 36a and 36 formed therein, and extending there-through, outwardly of the coils 27a and 27, respectively. Suitable drain tubes, such as, for example, rubber hoses 37a and 37 are connected to the drain openings 36a and 36, respectively, and extend downwardly therefrom. The hoses 37a and 37 may be stored in the compartments 12 and 13, respectively, and each may have a clamp 38 mounted thereon for opening and closing thereof. With this construction, any moisture accumulating on the evaporator 20 or the condenser 21 may be readily drained therefrom by opening the doors 15 and 16, pulling the hoses 37a and 37 outwardly therethrough, and opening the clamps 38.

In the operation of the novel cart 1, the compressor 32 may be driven by the motor 32a to thereby feed refrigerant from the compressor 32 through the conduit 31 into the inlet 28 of the coil 27 of the evaporator 21, from which it may flow through the coil 27 and be discharged therefrom through the outlet 29 and the conduit 33, including the capillary tube portion 34, into the inlet 28a of the coil 27a and be discharged therefrom through the outlet 29a and the conduit 35 to the inlet side of the compressor 32. During such operation of the refrigeration system embodied in the cart 1, the condenser 21 is heated to an elevated temperature in the nature of 130° to 135° F., and the evaporator is cooled to a relatively low temperature in the nature of 45° to 50° F. Thus, in the use of the cart 1, beverages and foods, or the like, which it is desired to keep cool may be placed on the evaporator 20, within the recess 18, and beverages and foods, or the like, which it is desired to keep warm may be placed on the condenser 21 in the recess 19. The compartments 12 and 13, in addition to storing the hoses 37a and 37, respectively, may also be used to store other articles, such as, for example, dishes, or the like, which it may be desired to have readily available.

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From the foregoing, it will be seen that the present invention affords a novel article of furniture.

In addition, it will be seen that the present invention affords a novel serving table type of construction which is effective, in a novel and expeditious manner, to cool beverages and foods, or the like, which it is desired to cool, and to warm beverages and foods, or the like, which it is desired to warm.

Also, it will be seen that the present invention affords a novel article of furniture which is practical and efficient in operation and which may be readily and economically produced commercially.

Thus, while I have illustrated and described the preferred embodiment of my invention, it is to be understood that this is capable of variation and modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. An article of furniture comprising

- (a) a table top,
- (b) means for supporting said table top,
- (c) a heat exchanger supported by said table top in position to support articles to be kept cool,
- (d) another heat exchanger supported by said table top in position to support articles to be kept warm, and
- (e) means for feeding refrigerant through said heat exchangers in a refrigeration cycle effective to cool said first mentioned heat exchanger and heat said other heat exchanger.

2. An article of furniture as defined in claim 1, and in which

- (a) said heat exchangers include
 - (1) bottom walls for supporting said articles, and
 - (2) upstanding side flanges on the peripheries of said bottom walls.

3. An article of furniture comprising

- (a) a cabinet having a top wall,
- (b) an evaporator mounted in said top wall in position to support thereon articles to be cooled,
- (c) a condenser mounted in said top wall in position to support thereon articles to be warmed, and
- (d) means, including a compressor mounted in said cabinet and operatively connected to said evaporator and said condenser, for feeding refrigerant through said evaporator and said condenser to thereby cool said evaporator and heat said condenser.

4. An article of furniture as defined in claim 3, and in which

- (a) said evaporator and said condenser each comprise multiply sheet metal members having passageways therethrough for passing refrigerant therethrough between the plys thereof.

5. An article of furniture as defined in claim 4, and in which

- (a) said sheet metal members have
 - (1) substantially horizontally extending central portions adapted to support said articles thereon, and
 - (2) flange portions projecting outwardly from said central portions and engaged with said top wall.

6. An article of furniture as defined in claim 5, and in which

- (a) said evaporator and said condenser have heat-insulating material on the bottoms thereof.

7. A cart comprising

- (a) an evaporator,
- (b) a condenser,
- (c) means, including a cabinet having wheels thereon, for transporting said evaporator and said condenser across a supporting surface in elevated relation to the latter,
- (d) said evaporator and said condenser being mounted

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on top of said cabinet in horizontally extending position effective to support containers of food thereon, and

(e) means mounted in said cabinet and operatively connected to said evaporator and said condenser for feeding refrigerant through said evaporator and said condenser in a refrigeration cycle of operation for cooling and heating them, respectively.

8. A cart as defined in claim 7, and which includes

(a) drain means operatively connected to said evaporator and said condenser for draining liquid off from the top thereof.

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