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REFRIGERATED SHELF

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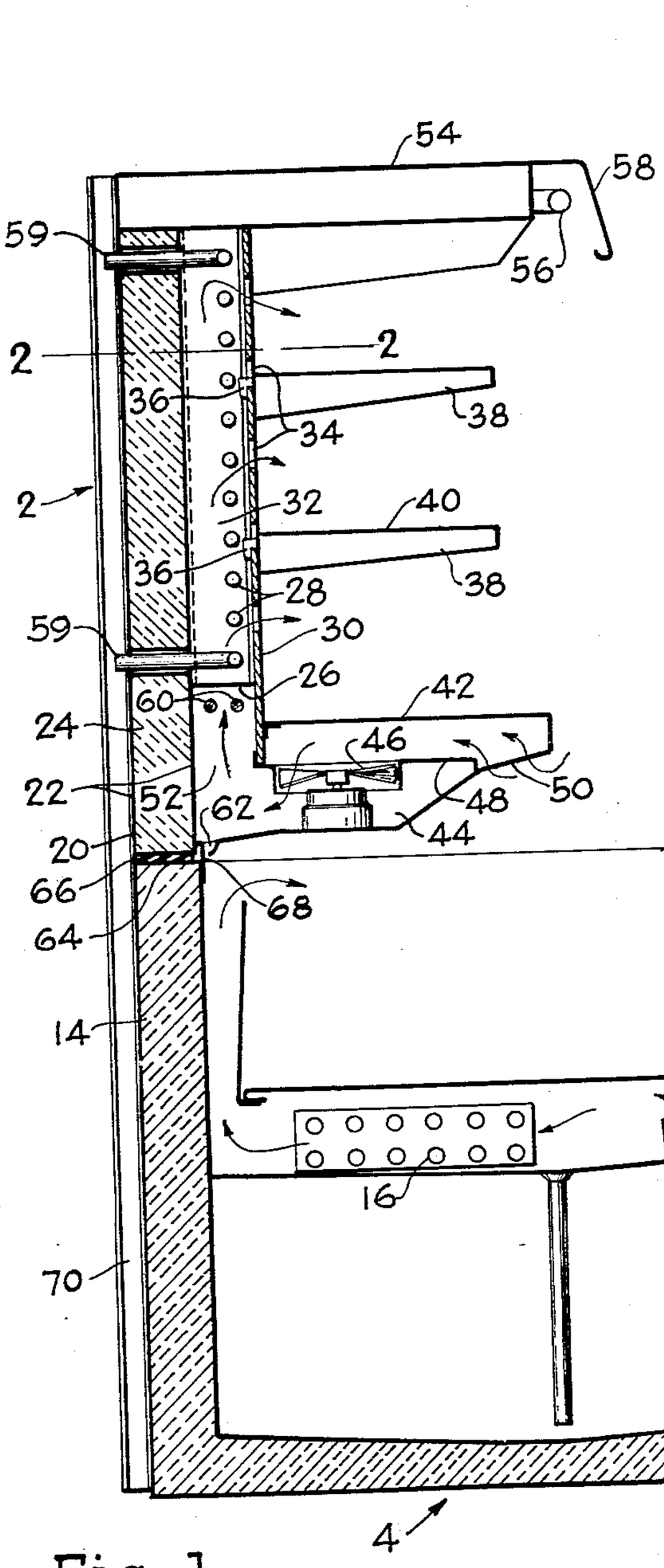

Fig. 1

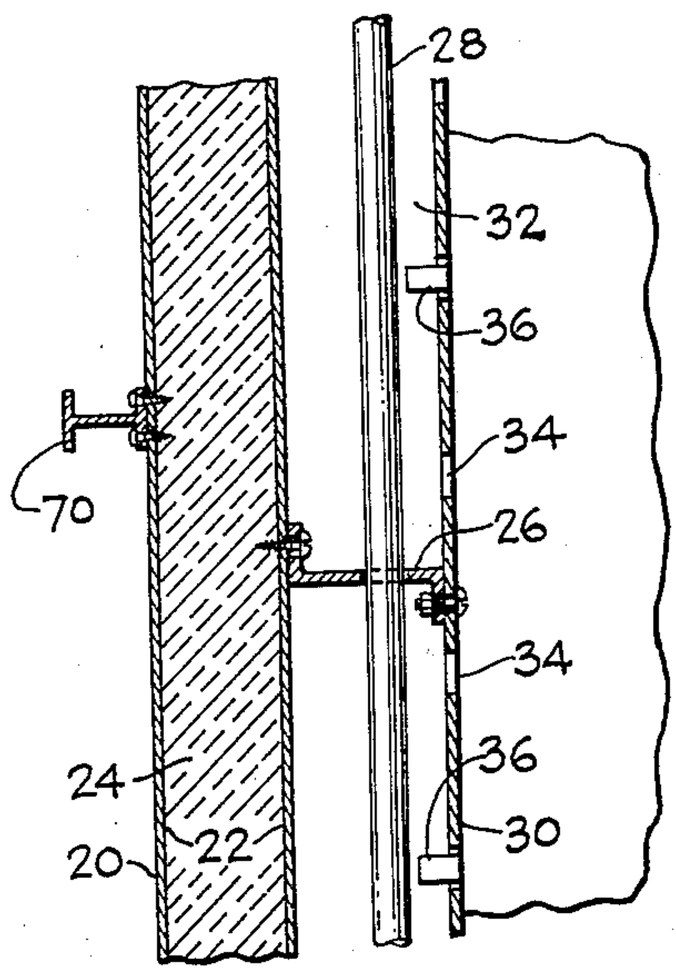

Fig. 2

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REFRIGERATED SHELF

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This invention relates to refrigerated shelving adapted to be used in combination with a display case or other fixture to increase the useful capacity thereof.

It is common practice to provide display cases or fixtures with upwardly extending side walls which surround a display space that is open at the top for access to customers. Such fixtures are often relatively small and inexpensive and may be used in various locations wherein larger and heavier equipment would not be suitable. Thus, they may be located in the central portion or an open area of a store, at the end of an aisle between other fixtures and elsewhere. However, in many instances it is desirable to increase the storage and display capacity of a fixture particularly when the arrangement of the fixtures in a store is to be changed.

In accordance with the present invention, refrigerated shelving is provided which is adapted to be applied to existing low walled fixtures to serve as a super-structure extending upward from one wall of the fixture and provided with shelves and refrigerating means which greatly increase the effective capacity of the equipment. The refrigerated shelving is constructed as a unit which may be applied to either refrigerated or non-refrigerated equipment and is secured in place thereon so as to present the appearance of an integral part of the original equipment. The units of the present invention are self-contained in that they include an evaporator and a blower for cooling and circulating air about and over merchandise supported on the shelves. Moreover, the construction is such that any refrigerated air flowing forward and downward from the shelving may be added to that circulating in a lower refrigerated case or may serve to cool articles, such as vegetables or the like which may be contained in the display space of a non-refrigerated case to which the unit is applied.

The shelving of the present invention may be made up in suitable lengths or sections, say, 4, 6 or 8 feet in length and may be applied to a fixture which is either the same length or longer than the unit. The unit can, in fact, be applied to a shorter fixture, if desired, provided there is no objection to an overhang at the end of the fixture. Moreover, the units may be applied to two abutting fixtures to extend upward from the rear wall of both cases.

Thus, the unit of the present invention is adaptable to various installations and locations and affords great flexibility in use.

Accordingly, the principal object of the present invention is to provide a novel type of refrigerated shelving adapted for application to various types of existing display fixtures.

Another object of the invention is to provide means for increasing the display and storage capacity of existing features used in self-service stores and elsewhere.

A further object of the invention is to provide a unit adapted to be super-imposed on existing fixtures and comprising shelving together with means for refrigerating and circulating air over the shelves.

These and other objects and features of the present invention will appear from the following description thereof wherein reference is made to the figures of the accompanying drawing.

Fig. 1 is a vertical sectional view through a typical unit embodying the present invention as applied to a typical form of display case, and

Fig. 2 is a horizontal sectional view of a portion of the construction shown in Fig. 1 taken on the line 2—2 thereof.

In that form of the invention chosen for purposes of illustration the unit of the present invention is indicated generally at **2** and is applied to a typical or conventional form of display case indicated at **4**. The display case has a display space **6** with a front wall **8** that may include a glass panel **10**, end walls **12** and an insulated rear wall **14**. The case shown is refrigerated by means of an evaporator coil **16** and air is circulated over the evaporator and from the rear to the front of the case by means of a blower **18**.

The unit **2** is provided with an insulated rear wall **20** which preferably includes front and rear metal facing sheets **22** enclosing the insulating material **24**. Brackets **26**, which are of generally **Z**-shaped cross section, extend vertically from the front of the rear wall **20** and are spaced apart a suitable distance to assure relatively free circulation of air upward adjacent the rear wall. The tubes of an evaporator **28** extend horizontally adjacent the rear wall of the unit and are supported by the brackets **26**. The brackets further serve to support a duct member **30** which is held in spaced relation with respect to the rear wall **20** so as to form an air duct **32** within which the coils of the evaporator **28** are located.

The duct member **30** is preferably formed of perforated sheet material and has openings **34** therein adapted to receive the rearwardly projecting lugs **36** carried by supports **38** for shelves **40**. The openings **34** may be suitably spaced and arranged to permit the shelves **40** to be located in various adjusted positions and further serve as outlets through which refrigerated air may flow forwardly from the air duct **32** and over the shelves **40** and about the articles supported thereon.

The lowermost shelf **42** of the unit is preferably imperforate and forms the upper surface of a fan housing **44**. A blower or fan **46** is located within the housing and a partition member **48** is arranged to divide the housing into an inlet chamber through which air is drawn from the air inlet **50** and an outlet chamber from which the air is directed to the lower end **52** of the air duct **32**.

The air inlet **50** preferably faces forwardly and downwardly below the lowermost shelf **42** so that it will not be obstructed by articles placed on the shelf and the full area of the shelf may therefore be utilized. Moreover when a unit embodying the present invention is used in combination with a refrigerated display case, such as that shown at **4**, the flow of air into the inlet **50** from a point adjacent the top of the display space **6** serves to reduce the tendency for warm air from above the display space to mingle with the refrigerated air being circulated through the display case. Moreover, any refrigerated air flowing downwardly and forwardly from the shelves of the unit **2** will mingle with the air being circulated in the display case whereby the external air entering the air stream of the display case is reduced in temperature. In this way, the efficiency of the refrigerated display case itself is increased.

Of course, if the display case to which the unit **2** is applied is not refrigerated, the refrigerated air flowing downward from the shelves of the unit **2** will serve to cool the articles in the display space to some extent. The units of the present invention can therefore be used to advantage with unrefrigerated cases employed for the

display of vegetables and other articles which do not require refrigeration but are advantangeously kept in a cool fresh condition.

The upper portion of the unit **2** is provided with a top **54** which extends forwardly from the rear wall **20** and may be provided with a light **56** and reflector **58**.

The evaporator **28** is provided with connections **59** by which refrigerant may be supplied to the evaporator from the compressor and condenser associated with the display case **4** or from any other source desired such as refrigerating means located in a basement or elsewhere.

The evaporator also may be provided with defrosting means such as the electrical elements **60** and the lower portion of the outlet chamber of the fan housing **44** may be inclined rearwardly and provided with a drain outlet as shown at **62** for directing water dripping from the evaporator during the defrosting operation into the rear portion of the display case **4** or to any other suitable point.

The rear wall **20** of the unit **2** preferably presents a horizontal lower edge which is provided with a positioning strip **64** designed to rest upon the upper edge of the rear wall **14** of the display case **4**. A gasket or sealing strip **66** may be located between the positioning strip **64** and the top of wall **14** and a cover strip **68** is provided to extend downward from the front face of the rear wall **20** of the unit to conceal the sealing strip **66** and present a neat trim appearance.

Standards or attaching members **70** are secured to the rear face of the rear wall **20** of unit **2** and extend downward below the lower edge of the unit into position to be secured to the rear face of the rear wall **14** of unit **4**. The attaching members illustrated are in the form of I beams or standards which may extend all the way to the floor or lower portion of the display case **4**. These standards, when suitably secured to the rear wall **20** of the unit **2** and the rear wall **14** of the display case **4**, serve to prevent forward tilting movement of the unit even when the shelves **40** and **42** are heavily loaded with merchandise.

In using units of the character described, it will be readily seen that they may be applied to substantially any type of display case, bin, table or other support or they may even be suspended from a wall in any desired location. The units may be made in suitable standard lengths for application to conventional fixtures but it is not necessary that the length of the unit be as great as that of the case or fixture to which it is applied. In fact, the equipment frequently is given a unique and attractive appearance by reason of the use of a unit which is shorter than the case and appears to be an integral super-structure of less width than the case.

The units also may extend across the ends of two abutting cases so that one end of the unit is secured to and supported by one case and the other end of the unit is secured to and supported by an adjacent case.

The construction thus provided is capable of many uses and applications and renders it possible to increase the capacity and utility of existing fixtures and to vary the arrangement and uses thereof.

It will, of course, be understood that the form, construction and arrangement of the elements employed in the construction of units embodying the present invention are capable of wide variation. In view thereof it should be understood that the particular form of the unit shown in the drawing and described above is intended to be illustrative only and is not intended to limit the scope of the invention.

I claim:

1. A unit adapted to be applied to a display case or the like to increase the useful capacity thereof, said unit comprising an insulated rear wall, a perforated duct member spaced from said rear wall and cooperating therewith to form a vertically extending air duct, shelves carried by said unit and extending horizontally in front of said duct member, means for refrigerating and circulating air through said air duct and into contact with articles supported on said shelves including an air inlet beneath the lowermost of said shelves and communicating with said air duct, and attaching means secured to said rear wall of the unit and extending downward below the same into position to be secured to a display case or the like.

2. A unit adapted to be applied to a display case or the like to increase the useful capacity thereof, said unit comprising an insulated rear wall presenting a horizontal lower edge for engagement with the upper edge of a display case, means secured to said rear wall and extending downward below said lower edge into position to be secured to a wall of a display case, shelves carried by said unit and positioned in front of said rear wall, an air duct extending vertically of said unit between said rear wall and said shelves, an evaporator located in said air duct, and a blower located below the lowermost shelf of said unit and operable to direct air upward through said air duct and over said evaporator, said air duct having an inlet opening below the lowermost shelf of the unit and the upper portion of said air duct having forwardly facing openings therein through which refrigerated air may flow into contact with articles on said shelves.

3. A unit adapted to be applied to a display case to increase the useful capacity thereof, said unit comprising an insulated rear wall, attaching means secured to the rear wall of the unit and extending downward below the same for securing said unit in place with respect to a display case, a perforated duct member spaced from said rear wall and cooperating therewith to form an air duct, shelves carried by said unit and extending forwardly in front of said duct member, a housing located below the lowermost shelf of the unit and having a downwardly facing air inlet therein communicating through said housing with the lower portion of said air duct, means for refrigerating air circulating through said air duct, and a blower in said housing for circulating said air.

4. A unit comprising an insulated rear wall having a horizontal lower edge adapted to rest upon the upper edge of a display case, attaching means secured to said rear wall and extending downward below said lower edge into position to be secured to a display case, spaced vertically extending bracket members secured to the front wall of the unit, a duct member secured to said bracket members and spaced from said rear wall to form a vertically extending air duct, said duct member having openings therein, shelf supports secured to said duct member and projecting forwardly therefrom in vertically spaced relation, shelves on said supports in position to receive air issuing from said openings in said duct member, an evaporator located in said air ducts and supported by said bracket members, a housing located below the lowermost shelf on said unit and having a forwardly and downwardly facing air inlet through which air may flow from said inlet to the lower portion of said air duct, and a blower in said housing operable to draw air in through said air inlet and force it through said air duct and over said evaporator and thence through opening in the duct member into contact with articles supported on said shelves.

5. In combination with a display case having a display space which is open for access at the top but surrounded by upwardly extending walls one of which presents a horizontal upper edge, a unit applied to said display case and having an insulated rear wall presenting a horizontal lower edge resting upon said horizontal upper edge of said display case, means secured to said rear wall of said unit and to said display case for attaching the unit to the display case, a duct member spaced from said rear wall of the unit and cooperating therewith to form an air duct, shelves carried by the unit and located in front of said duct member, said air duct having an inlet located

below the lowermost shelf of the unit and above the display space of said display case and means carried by said unit for refrigerating and circulating air through said inlet and to said air duct and over said shelves independently of any elements employed in said display case.

6. In combination with a display case having a display space which is open for access at the top but surrounded by upwardly extending walls one of which presents a horizontal upper edge, a unit applied to said display case and having an insulated rear wall presenting a horizontal lower edge resting upon said horizontal upper edge of said display case, means secured to said rear wall of said unit and to said display case for attaching the unit to the display case, a duct member spaced from said rear wall of the unit and cooperating therewith to form an air duct, shelves carried by the unit and located in front of said duct member, and projecting forwardly over a portion of the display space in said display case, a housing located below the lowermost shelf of said unit and having an air inlet facing forwardly and downwardly above the display space of said display case, means in said air duct for refrigerating air passing therethrough, and means in said housing for drawing air through said air inlet and forcing it through said air ducts and outward therefrom into contact with articles on said shelf.

7. In combination with a display case having a display space which is open at the top for access to customers but closed about the sides by upwardly extending walls one of which presents a horizontal upper edge, means for refrigerating and circulating air through said display space, a unit applied to said display case and having an insulated rear wall presenting a horizontal lower edge resting upon said horizontal upper edge of said display case, means secured to said rear wall of said unit and to said display case for attaching the unit to the display case, a duct member spaced from said rear wall of the unit and cooperating therewith to form an air duct, shelves carried by the unit and located in front of said duct member and projecting forwardly over a portion of the display space in said display case, a housing located below the lowermost shelf of said unit and having an air inlet facing forwardly and downwardly above the display space of said display case, means in said air duct for refrigerating air passing therethrough, and means in said housing for drawing air through said air inlet and forcing it through said air ducts and outward therefrom into contact with articles on said shelf.

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