Jan. 5, 1971 B. K. DAVIS 3,552,138

REFRIGERATED DISPLAY UNIT

Filed Oct. 13, 1965 2 Sheets-Sheet 1

FIG. 1

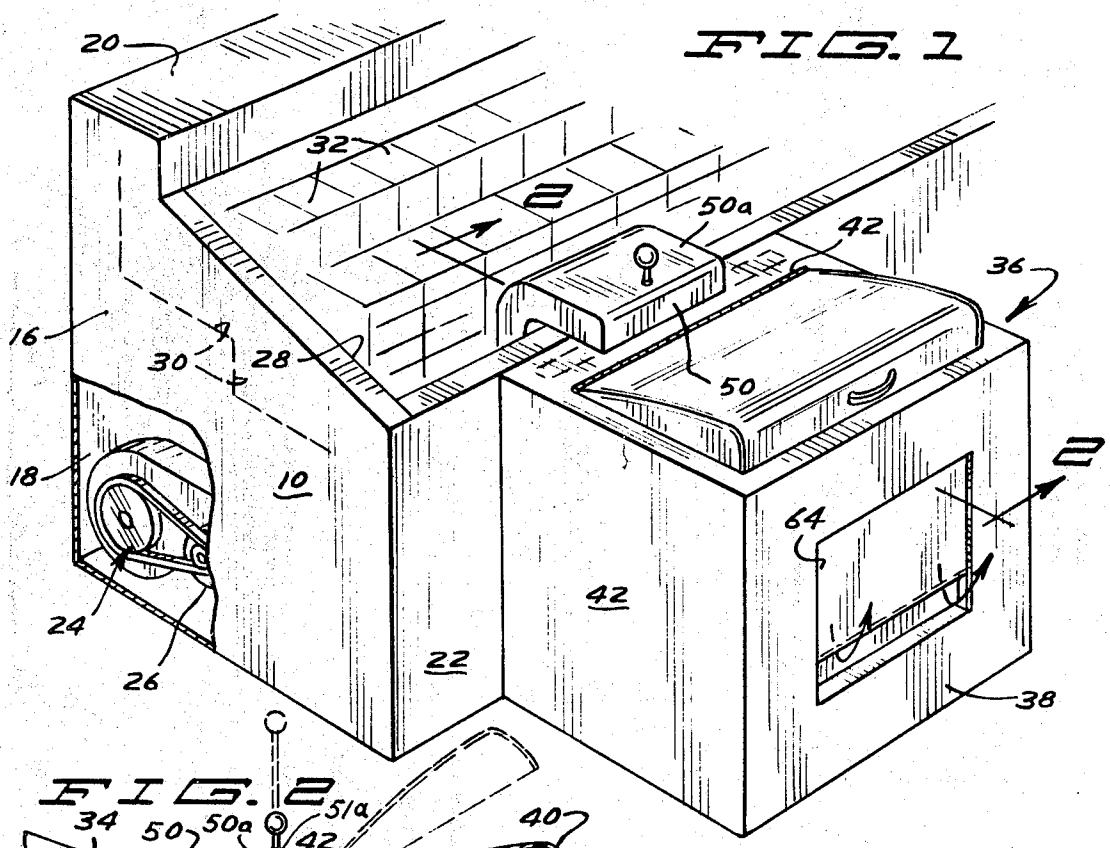


FIG. 2

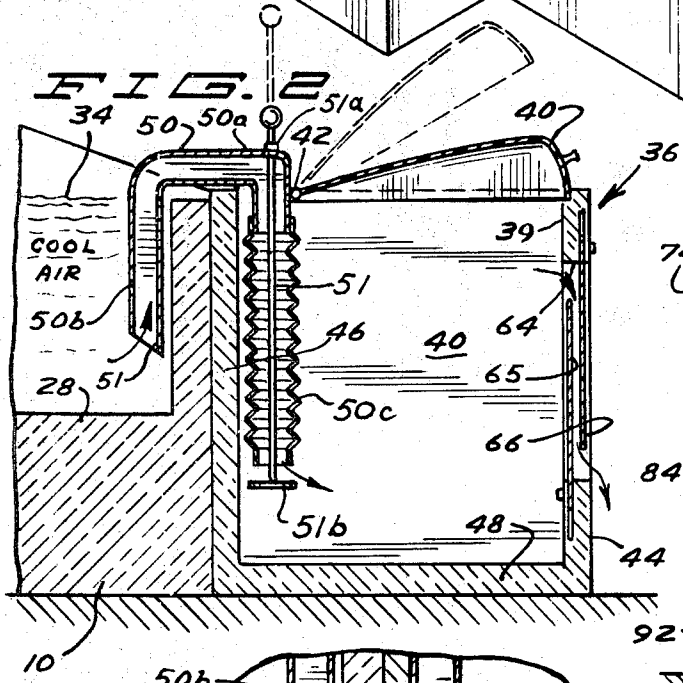
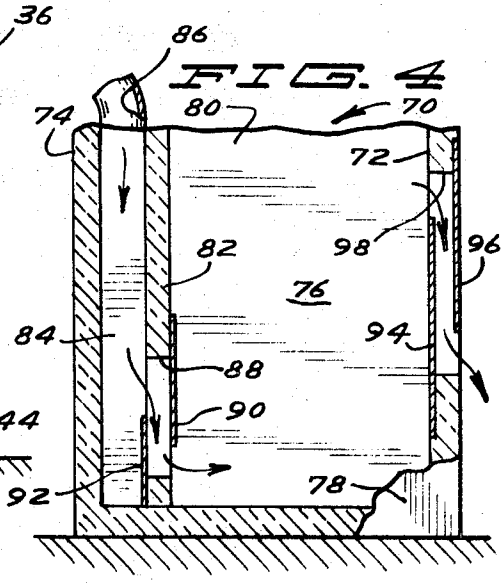


FIG. 4



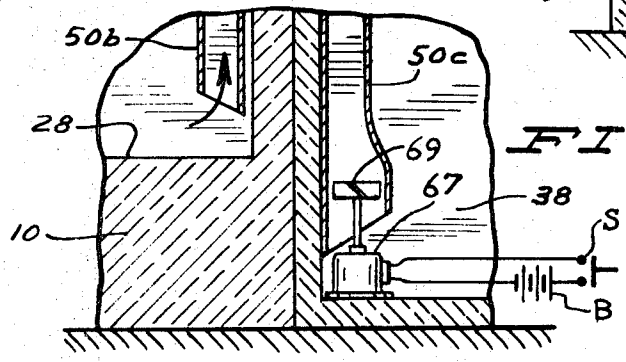


FIG. 3

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FIG. 5

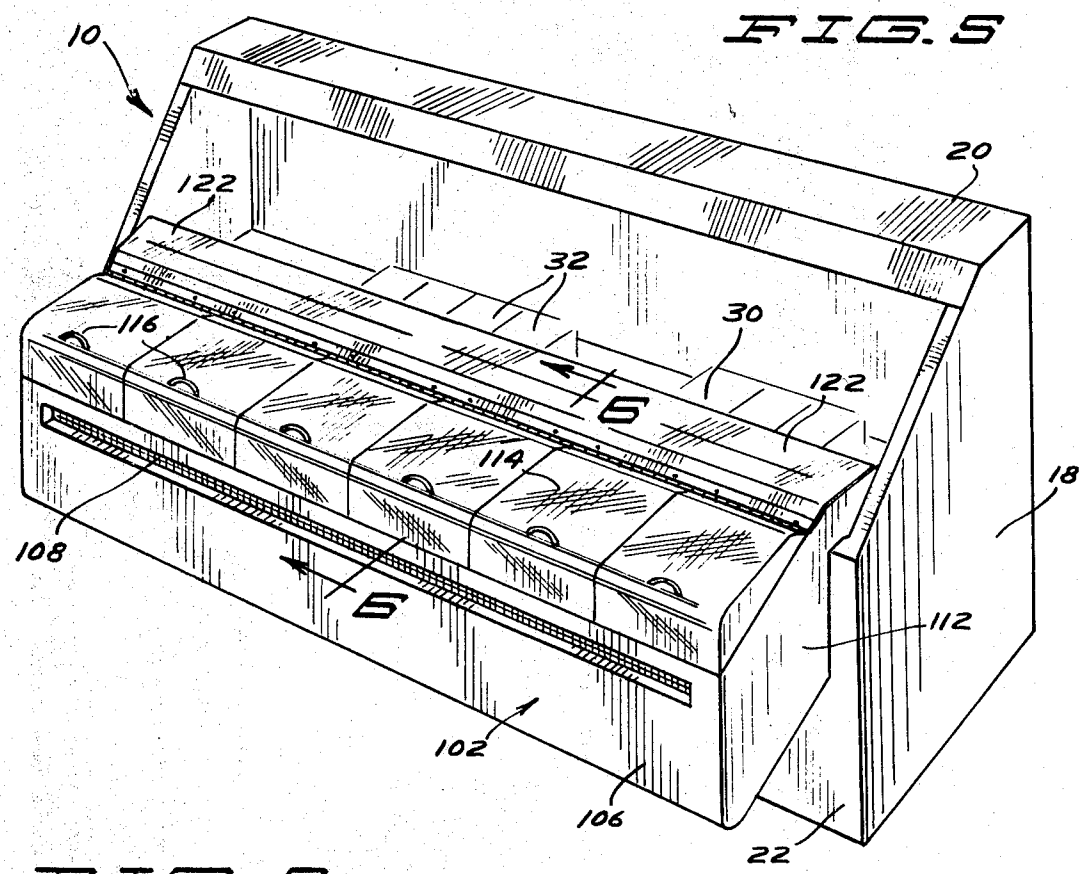
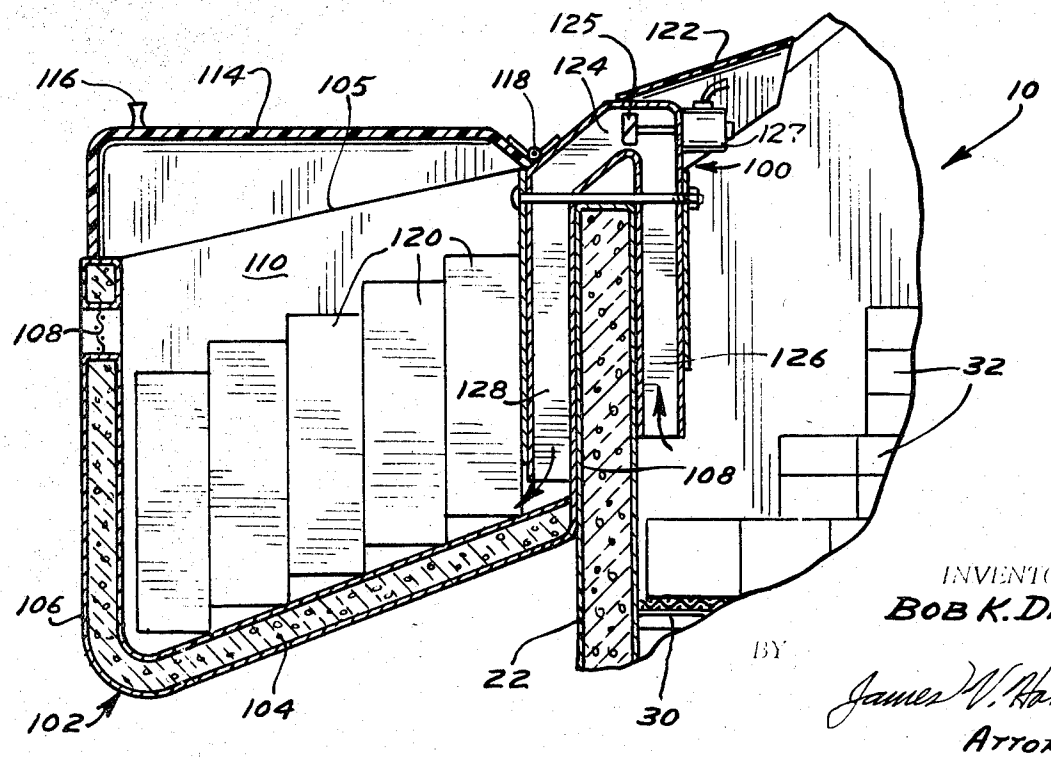


FIG. 6



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REFRIGERATED DISPLAY UNIT

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Int. Cl. A47f 3/04
U.S. Cl. 62—249 12 Claims

The present invention relates to refrigerated display cases used for storing and displaying refrigerated or frozen foods in retail stores.

Many display cases have been previously proposed for storing and displaying foods under refrigeration. The refrigerated display cases now in use are frequently overfilled and space in them is at a great premium because of their relatively small capacity compared with that available in display cases and racks which are unrefrigerated. This, of course, is due to their higher cost. Anyone who has shopped in a modern supermarket will be familiar with the difficulties encountered in attempting to find a particular food product stored in either a refrigerated or frozen food storage case when the food products are piled one on top of another. At the present time there is no satisfactory solution to this problem. Thus, refrigerated and frozen food cases continue to be filled to capacity and sometimes slightly beyond their designed capacity with food products making it difficult for purchasers to see the food products and withdraw them easily from the case. My invention is designed to help eliminate this unpleasant and time-consuming task. In view of these problems encountered in the prior art it is one object of the present invention to provide an effective and relatively inexpensive means for substantially expanding the available storage space in a frozen or refrigerated display case.

Yet another object of the present invention is to provide an auxiliary display case for frozen and refrigerated foods which is inexpensive to produce, reliable in operation and rugged in construction.

A further object of the invention is the provision of an apparatus for substantially expanding the available storage space in a frozen or refrigerated food case which provides substantial manufacturing economies through the lack of requirement for an integral refrigeration unit.

A further object of the invention is the provision of an improved display case and auxiliary storage unit which both refrigerates the goods stored therein as well as effectively displaying the foods where they can be easily seen by the purchasers.

Yet another object of the invention is the provision of an improved refrigeration and display unit wherein manufacturing economies are obtained through the use of a single element both to provide refrigeration for the case as well as for securing the auxiliary display unit to a primary display case.

These and other and more specific objects of the invention will become apparent from the following specification and claims wherein:

FIG. 1 is a partial perspective view of one form of the invention.

FIG. 2 is a transverse vertical sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is a partial vertical sectional view of a modified form of the invention on the same scale as FIG. 2.

FIG. 4 is another embodiment of the invention on the same scale as FIG. 2.

FIG. 5 is a perspective view of another embodiment of the invention, and

FIG. 6 is a vertical sectional view taken on line 6—6 of FIG. 5.

Refer now to FIGS. 1 and 2 which illustrate a refrigerated display case 10 of well-known construction and a

display case 36 according to the invention. The display case 10 includes a housing having side walls 16, a rear wall 18, a top wall 20 and a front wall 22. Also included is a refrigeration apparatus 24 of the compressed gas type powered by an electric motor 26. The display case also includes a food compartment 28 which is open at the top and provided with shelves 30 upon which food articles 32 rest. As clearly shown in FIG. 2, the compartment 28 is filled with cool air 34 produced by the refrigeration apparatus 24 and conveyed to the storage compartment 28 by means of suitable air ducts not shown.

In accordance with the invention, there is provided an auxiliary refrigerated or frozen storage and display unit 36 including a housing 38 having a pair of parallel side walls 40 and 42, a front wall 44, a rear wall 46 and a bottom wall 48. Each wall is formed from a suitable heat insulating material such as a pressed fiberboard, foam plastic, corrugated paperboard, fiber glass insulating material held between layers of sheet metal or the like. Other suitable insulating materials known to the art can be employed.

At the upper end of the auxiliary display unit 36 is an opening 39 which is closed by means of a cover 40 formed from a transparent material such as a polymethyl methacrylate that is connected at its rearward end by means of a pivot 42 so that it can be raised and lowered when food products are to be placed within the unit 36 or withdrawn therefrom. Suitably secured to the rearward wall 46 is a retainer 50 which is generaly U shaped as seen in side elevation including a horizontal leg 50*a*, a vertical leg 50*b* connected thereto and extending downwardly into the storage compartment 28 and a second parallel leg 50*c* which consists of a flexible rubber hose extending downwardly into the housing 38. The retaining means 50 is hollow to provide a duct means 51 communicating between the food compartment 28 and the interior of the auxiliary storage unit for syphoning the cool air within the housing 28 from the bottom of the case 10 where the temperature is the lowest to the lower portion of the housing 38. Within the leg 50*c* is a pumping means comprising a rod 51 slidably mounted in a sleeve 51*a*. At the lower end of rod 51 is a plate 51*b* positioned to close the lower end of hose 50*c*. Continued lifting of the rod 51 will elevate the hose 50*c*. When rod 51 is lifted repeatedly, cool air will be pumped in to the housing 36 from case 10. Once retainer 50 is filled with cool air, flow will continue by itself.

The warmer air within the housing 38 will pass out through an opening 64 provided with a pair of vertically disposed parallel baffles 65 and 66 which extend over a part of the opening 64. The inner plate 65 terminates a short distance from the top of the opening 64 and the plate 66 terminates a short distance above the bottom of the opening 64.

Refer now to FIG. 4 which shows a modified form of the invention. In this form, an auxiliary storage and refrigeration unit indicated generally at 70 includes front and back walls 72 and 74 and side walls 76 and 78 of a suitable insulating material such as of the type described above such as pressed board, foamed plastic, cardboard or any of the well-known conventional insulating materials supported between inner and outer panels of a different material such as sheet metal to define a storage compartment 80. Adjacent the back wall 74 and slightly spaced therefrom is a laterally extending vertically disposed panel 82 to define a duct 84 which is connected by means of a suitable duct 86, only a part of which is shown, to a refrigeration unit such as the display case 10 of FIGS. 1 and 2. A cover (not shown) identical with the cover 40 is used in the apparatus of FIG. 4. During operation, cool air movement is started in any convenient

manner following which cool air will travel downwardly through the duct **86** from the primary refrigeration unit **10** through the duct **84** and thence through an opening **88** into the compartment **80**. Suitable baffles such as vertically disposed plates **90** and **92** are provided adjacent the opening **88** for controlling the rate of flow of cool air from duct **86** into the compartment **80**. A pair of similar parallel and vertically disposed baffles **94** and **96** are provided at the front and rear of an outlet opening **98** in the front wall **72** for controlling the flow of cool air therefrom.

Refer now to FIG. 3 which illustrates a slightly modified form of the apparatus of FIGS. 1 and 2 and wherein the same numbers refer to corresponding parts. In the apparatus of FIG. 3 the flexible hose and rod **51** are replaced by a solid duct **50***c* and motor **67** connected to a fan **69** within the duct **50***c*. The motor is operated by a current supplied through conductors wired to a switch S and battery B. The switch S is temporarily closed to start the air flow through duct **50***c*. Thereafter air will continue to flow of its own accord. A continuous flow of cool air at a relatively slow rate will then occur through the duct means **51**.

Refer now to FIG. 5 which illustrates another form of the invention including a display case **10** similar to the display case **10** of FIG. 1 with the same numerals referring to corresponding parts. Secured to the front of the display case **10** by means of a combined duct means and retainer **100** is an auxiliary laterally elongated refrigerated storage and display case **102** of sufficient length to extend the full length of the display unit **10**. The unit **102** includes a downwardly and forwardly inclined bottom wall **104**, a vertically disposed front wall **106**, a back wall **108** and end walls **110** and **112** all composed of heat insulating material such as foamed polystyrene. At the top of the display unit **102** is an opening **105** that is covered with a plurality of laterally aligned and adjacent lids **114** each having a handle **116** and each being secured at its rearward end by means of a pivot **118** to the auxiliary display unit. During operation, when the handles **116** are raised food products **120** can be either inserted or removed from the display case. Because bottom wall **104** is inclined, the tops of the food articles are spaced slightly below one another in a stepped pattern thereby presenting more of the printed material on each package in a position where it can be easily seen by a shopper. Suitably secured to the top of the retainer and duct means **100** is an inclined rearwardly extending sheet of plastic **122** for limiting the flow of cool air from the lower end of the display case **10**. The sheet **122** is made of clear plastic or the like so that food articles **32** within the case **10** can be easily seen.

The combined retainer and duct means **100** includes a connecting section **124** and a pair of spaced apart vertically disposed sections **126** and **128**, one on either side of the front wall **22** of the display case **10**. In the front of the auxiliary case **102** is an opening **108** through which warm air is exhausted. Within connecting section **124** is a fan **125** that is driven either continuously or intermittently by a small motor **127**.

The term "refrigeration or refrigerated" as used herein is meant to include a chilled condition below room temperature and usually below 40° F. and to include a condition in which the article being stored is at a temperature below its freezing point.

It is apparent that many modifications and variations of this invention as hereinbefore set forth may be without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

I claim:

1. A combined auxiliary refrigeration and display case for use with a primary display case comprising an enclosure formed from a heat insulating material defining a storage compartment in the enclosure, an opening in the enclosure for inserting and withdrawing food products therefrom and a duct means extending from the auxiliary refrigeration and display case to said primary display case for conveying cool air from the primary display case into the auxiliary display case.

2. A combined auxiliary refrigeration and display case for use with a source of refrigerated air comprising in combination an enclosure formed from a heat insulating material, an opening in the enclosure for inserting and withdrawing food products therefrom and a hollow fastener means extending from the auxiliary refrigeration and display case to the source of refrigerated air for connecting the case to the source of air and for conveying the refrigerated air into the auxiliary display case.

3. A combined auxiliary refrigeration and display case adapted to be used with a primary display case comprising in combination an enclosure formed from a heat insulating material defining a compartment in the enclosure, an opening in the enclosure for inserting and withdrawing food products therefrom, a duct means extending from the primary display case for conveying cool air into the auxiliary display case and a pump means for regulating the flow of air through the duct.

4. An auxiliary refrigeration display case for attachment to a primary display case comprising in combination an enclosure formed from a heat insulating material defining a compartment in the enclosure, an opening in the enclosure for inserting and withdrawing food products therefrom and a U-shaped duct means extending from the display case to said primary display case for conveying cool air from the primary display case into the auxiliary display case.

5. In a refrigeration apparatus including a primary refrigeration storage unit and a secondary display refrigeration unit, the improvement comprising a combination retainer and duct for securing the secondary refrigeration display unit to the primary refrigeration storage unit, said retainer being hollow and providing duct means for conveying refrigerated air from the primary refrigeration storage unit to the secondary display refrigeration unit.

6. In a refrigeration apparatus including a primary refrigeration storage unit and a secondary display refrigeration unit, the improvement comprising a combination retainer and duct for securing the secondary refrigeration display unit to the primary refrigeration storage unit, said retainer being hollow and providing duct means for conveying refrigerated air from the primary refrigeration storage unit to the secondary display refrigeration unit, a pump in the duct for pumping refrigerated air from the primary refrigeration storage unit to the secondary display refrigeration unit.

7. In a refrigeration apparatus including a primary refrigeration unit and a secondary refrigeration and display unit, the improvement comprising a combination retainer and duct for securing the secondary display unit to the primary refrigeration unit, said retainer being hollow and providing duct means for conveying refrigerated air from the primary refrigeration unit to the secondary refigeration and display unit and an inclined bottom wall on the seconday unit to support goods therein in a stepped pattern.

8. An auxiliary display unit for use with the primary refrigeration display unit, said auxiliary unit comprising an insulated compartment and a syphon connected thereto and adapted to extend to the bottom of the primary refrigeration and display unit for conveying cooling air from the primary refrigeration and display unit into the auxiliary refrigeration and display unit.

9. An auxiliary refrigeration and display unit for use with the primary refrigeration display unit, said auxiliary unit comprising an insulated compartment, said compartment having an opening at the top, a cover pivotally secured to the top of the compartment over the opening,

a syphon connected thereto and adapted to extend to the bottom of the primary refrigeration and display unit for conveying cooling air from the primary refrigeration and display unit into the auxiliary refrigeration and display unit and pumping means to at least initiate the flow of cool air from the primary refrigeration unit to the auxiliary unit.

10. An auxiliary refrigeration and display unit for use with the primary refrigeration display unit, said auxiliary unit comprising an insulated compartment having side walls and a syphon connected thereto and adapted to extend to the bottom of the primary refrigeration and display unit for conveying cooling air from the primary refrigeration and display unit into the auxiliary refrigeration and display unit and an opening in a wall of the compartment for exhausting air therefrom.

11. An auxiliary refrigeration and display unit for use with the primary refrigeration display unit, said auxiliary unit comprising an insulated walled compartment having an opening at the top, a cover over the opening, a syphon connected thereto and adapted to extend to the bottom of the primary refrigeration and display unit for conveying cooling air from the primary refrigeration and display unit into the auxiliary refrigeration and display unit and an opening in one wall of the compartment for exhausting air from the compartment.

12. An auxiliary tray adapted for use with a refrigerated display case;

said tray comprising a substantially rectangular tray housing having a front wall, a rear wall, two side walls and a bottom, said tray being open at the upper part thereof;

duct means for drawing air through said tray from said case; and,

means for connecting said tray to said case,

whereby cold air from said case is drawn into said tray and through said duct to cool goods contained on said floor of said case.

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U.S. Cl. X.R.

62—252, 256, 419