INTELLECTUAL PROPERTY OFFICE OF SINGAPORE
PATENT AGENTS QUALIFYING EXAMINATION 2011

PAPER A: PREPARATION OF A PATENT SPECIFICATION
10 October 2011, Monday
1330 – 1730 hrs

Maximum Time: 4 Hours (includes reading time) Maximum Marks: 100

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INSTRUCTIONS TO CANDIDATES

1. This Paper consists of 17 pages, including this cover page.

2. Write your answers in English. Answers in any other language will not be marked. Answers in illegible handwriting will not be taken into consideration.

3. Two copies of the question paper are provided, one is for your reading and the other is for your use (optional) when answering the question(s) in the Answer Booklet(s).

4. Only your answers and/or drawings to the question(s) written or glued in the Answer Booklet(s) provided by the Examination Secretariat will be considered. You are to write on one side of each sheet in the Answer Booklet(s).

5. Information provided in the question(s) may be obtained from actual situations or modified therefrom for the purpose of this examination. You should accept the facts given in the paper. Assume also that the prior art given is exhaustive.

6. The document provided in this question is:

   Document A – Client's write-up of his invention (7 pages of description including question, invention disclosure and 2 pages of drawings; Prior Art A and Prior Art B).

End

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Document A – Client's write-up of his invention (1/16)

Your client Mr Smith has come to discuss a new invention. Mr Smith owns a refrigerator service company, Refri-Serve, which has been successful in establishing a high quality refrigerator repair and maintenance business in Singapore.

Mr Smith presents you in your meeting with an Invention Disclosure, which describes an invention relating to refrigerator design, in particular to the design of a door structure of refrigerators. Mr Smith explains in the meeting that recently doors have been designed without handles for opening, such as biased locking mechanisms which are activated e.g. by depressing a button or the entire door. He also mentions that, other means for arresting the cover member in the "closed" position on top of the transparent sealing door may be provided including e.g. structures incorporating magnets. However, according to him, the described handle mechanism and hinge-with-arrest function" are preferred as they each provide ease of manufacture and superior reliability, in particular the handle mechanism.

Mr Smith is very excited about the new invention, as it presents several business opportunities to Refri-Serve. On the one hand, with this invention, Refri-Serve can expand into manufacturing of refrigerators, which has long been a vision of Mr Smith's. His research has shown that the hot climate in Singapore and South East Asia means that customers more frequently replace their refrigerators with the latest models to benefit from design improvements, in particular in relation to energy efficiency for both environmental reasons as well as for running cost savings.
On the other hand, Mr Smith believes that the invention has the potential to diversify into a fitting service for refrigerator doors to existing fridge bodies, which can give customers the opportunity to benefit from the invention without having to commit to the substantial investment of buying a new refrigerator.

Mr Smith wants you to prepare and file a patent specification for a Singapore patent application first, which may be followed by international filings later. In preparing the specification, including the claims, Mr Smith wants you to specifically be aware of the business opportunities described above. At the same time, he wishes the number of claims to be kept to no more than 10, to save on future official fees.

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Document A – Client's write-up of his invention (2/16)

Before coming to the meeting with you, Mr Smith conducted a prior art search. He found two documents: Prior Art A and Prior Art B. Both documents were published more than one year ago.

In drafting the specification, Mr Smith wants you to consider Documents "Prior Art A" and "Prior Art B" as the only prior art.

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Document A – Client's write-up of his invention (3/16)

Invention Disclosure

The invention provides a refrigerator door structure which allows a user to selectively open only a cover member of the door structure for looking into the refrigerator through a transparent sealing door for selection of goods, or to open both the cover and the transparent sealing door to gain access to the interior of the refrigerator.

In Figure 1, a refrigerator 10 comprises a door structure 12. The door structure 12 comprises an opaque cover member 14 and a transparent sealing door 24 which are hingedly connected to the frame 16 of the refrigerator 10 through hinge mechanisms 18, 20.

The opaque cover member 14 is made from the same sheet material as the outer layers of the frame 16 and body of the refrigerator 10. Thus, with the door structure 12 closed , the refrigerator 10 has the appearance of a "conventional", i.e. non-transparent door, refrigerator.

In the invention, a cover handle 22 is provided on the cover member 14 for "opening" and "closing" the opaque cover member 14 while the transparent sealing door 24 is in a closed position in which the transparent sealing door 24 abuts the frame 16 of the refrigerator 10. The sealing door 24 comprises on its inner surface a conventional sealing means for thermally sealingly engaging the frame 16 of the refrigerator 10 in a closed position. Furthermore, the transparent sealing door 24 comprises transparent compartments, e.g. 13, 15 on its inside surface within the perimeter of the frame 16, of the type used in conventional refrigerator door to store goods such as bottles, butter, eggs, jams, or the like. If the compartments are made from opaque material, they may obstruct or at least reduce the view into the fridge.

The hinge mechanisms 18, 20 incorporate resilient prongs (not shown) to releasably lock the cover member in the "closed" position on top of the transparent door 24. Details of the hinge mechanism 18, 20 will be described below with reference to Figure 2.

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Document A – Client's write-up of his invention (4/16)

The transparent sealing door 24 comprises a second handle 26 disposed in a manner such that it passes through an opening 28 of the cover member 14 when the cover member is in the "closed" position. Accordingly, in the invention opening of the cover member utilising the cover handle 22 will only "open" the cover member. The transparent sealing door 24 requires a certain force to be opened just like conventional refrigerator doors, which reduces the likelihood of unintentional opening of the transparent sealing door 24 when "opening" the cover member 14.

After the user has made a selection by looking at the contents of the refrigerator 10 through the transparent sealing door 24, it can then be opened using the second handle 26. Thus, the time during which the interior of the refrigerator is exposed to the ambient temperature is kept at a minimum. If the user wishes to open the refrigerator door structure in its entirety, i.e. without the need to look at the contents beforehand, then this can be effected by pulling the second handle 26 only, which will open the transparent sealing door 24 together with the cover member 14.

The transparent sealing door 24, on the inside thereof, comprises transparent compartments e.g. 13, 15 for storage of goods such as bottles, butter, eggs, jams, or the like. It will be appreciated that forming the compartments from a transparent material increases the visibility of goods inside the refrigerator 10 when only the cover member 14 is opened. The transparent compartments e.g. 13, 15 may be formed integrally with/on the inside surface of the transparent sealing door 24 or fully or in part as discrete elements mounted to the inside surface of the transparent sealing door 24.

In the refrigerator door of the invention shown in Figure 1, side surfaces e.g. 30 of the transparent sealing door 24 are covered with the same (non transparent) sheet material as the cover member 14 and the outer layers of the frame 16 and body of the refrigerator 10, which results in the appearance of the refrigerator 10 (with the cover member 14 "closed") that is substantially identical to a conventional refrigerator. The preferred embodiment thus allows freedom of design while providing a transparent door for selection.

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Document A – Client's write-up of his invention (5/16)

The cover member may be shaped to fit around the side portions of the transparent sealing door 24, e.g. 30, in which case no further covering of the transparent sealing door 24 on those portions is required. Various suitable, transparent and thermally insolating materials may be chosen for the manufacture of the transparent sealing door 24, including e.g. Plexiglass. Furthermore, the transparent sealing door 24 may comprise different layers separated by an air containing or evacuated gap, or additional transparent sheet materials which may enhance the thermal isolating qualities of the transparent sealing door 24. Similarly, the cover member 14 may comprise more than one material layer.

Also, further sealing means may be provided on the periphery of the outer surface of the transparent sealing door 24 or on the inner surface of the cover member 14 to enhance the thermal isolation when the cover member is "closed"

Turning now to Figure 2, the details of the hinge mechanisms 18, 20 of the invention will be described. The hinge mechanisms 18, 20 comprise a first rotating arm 40 and a second rotating arm 42 rotating around the same axis indicated by dotted line 44. The first rotating arm 40 is connected to the transparent sealing door 24, while the second rotating arm 42 is connected to the cover member 14. The first and second rotating members 40, 42 are rotatably fitted to a mounting bracket 46 fixed to the body of the refrigerator 10 (see Figure 1) by way of concentrically fitted outer and inner tubular axle members 48, 50 respectively.

A resilient protrusion 52 is formed on the first rotating arm 40 in a manner such that, when the cover member 14 is "closed", it arrests the cover member 14 against the transparent sealing door 24. The resiliency of the resilient protrusion 52 is chosen such that it offers a resistance to the "opening" of the cover member 14 which is low enough to reduce the likelihood of inadvertent opening of the transparent sealing door 24 when pulling only at the cover handle 22 (see Figure 1).

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Document A – Client's write-up of his invention (6/16)

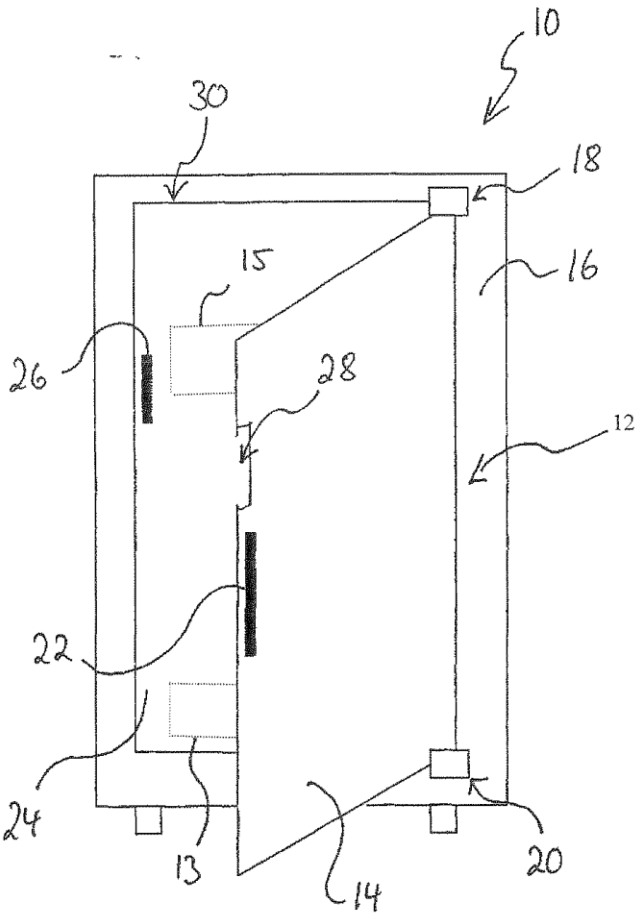

Figure 1

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Document A – Client's write-up of his invention (7/16)

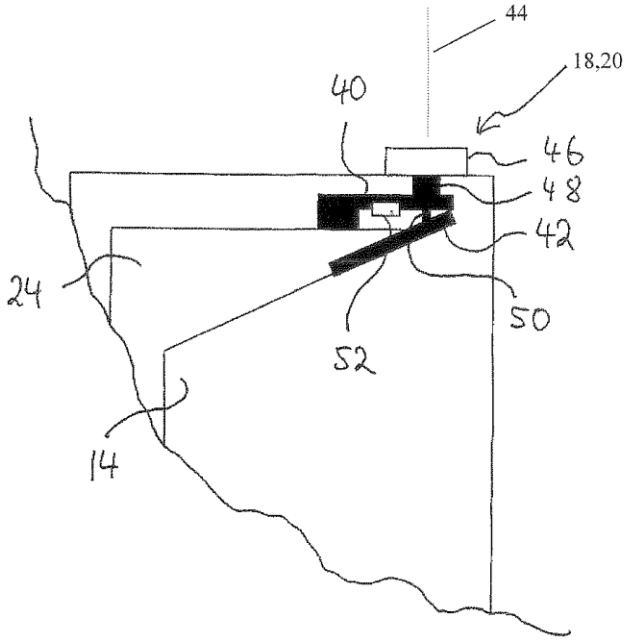

Figure 2

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Document A – Client's write-up of his invention (8/16)

Prior Art A

A MULTIPURPOSE REFRIGERATOR

TECHNICAL FIELD

The Invention described here is a multipurpose refrigerator. In front of the refrigerator, a transparent opening and shutting door and an opaque detachable cover are installed in order. The transparent opening and shutting door can be rotated open or rotated shut. The outer opaque door can be attached or detached. If you take off the cover, you can use it for commercial purpose. On the other hand, if you use the refrigerator as it is, it would function as an excellent thermal insulating multipurpose refrigerator.

BACKGROUND ART

In general, the categorization of home use and commercial use is based on its appearance, but the opening and shutting door can make a different category based on the usage and purpose of using it. That is to say, the opening and shutting door of the home use refrigerator is opaque in general, so the content of it can not be seen from outside On the other hand, the opening and shutting door of a commercial refrigerator is transparent because it needs a display effect. So up to now, there has been a problem which restricts the purpose of refrigerator use just because of the difference of an opening and shutting door.

DISCLOSURE OF INVENTION

As described above, to solve the previous problem and inconvenience at the same time, we invented a multipurpose refrigerator which has a transparent door and an outer opaque detachable cover so that users can put it on or take it off according to the place they use the refrigerator (home or store etc). This is quite an invention with many benefits It expands the range of usage, because only by putting

Document A – Client's write-up of his invention (9/16)

Prior Art A

on or taking off the opaque cover (2) outside of the transparent door (1), you can convert the usage of the refrigerator (N) between home use and commercial use.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawing 1 is a partial exploded illustration of the invented refrigerator.
The drawing 2 is an illustration of detaching the opaque cover from the transparent door.

BEST MODE FOR CARRYING OUT THE INVENTION

With reference to Figure 1, we built a refrigerator (N) with one transparent door (1) and one opaque cover (2), and then inserted the rotating axis recesses (e.g. 201, 202) at the top and bottom of the opening and shutting door (1) and the cover (2) respectively into the projected rotating support axes (e.g. N1a) at the top and bottom support parts (e.g. N1) of refrigerator (N) so that the transparent opening and shutting door (1) and the opaque cover can be rotated together, yet making the opaque cover (2) such that it can be attached or detached at the front of the transparent door (1).

Clips (220, 222) are provided at the top and bottom of the opaque cover (2) respectively. The clips (220, 222) are positioned at the opposite end of the opaque cover (2) than joint parts (203, 213) in which the rotating axes recesses (e.g. 202) are formed. The clips (220, 222) each have pivoted clamp portions (224, 226) designed to be received in corresponding recesses (e.g. 228) on the top and bottom inner peripheral surface of the transparent door (1). The clamp portions (224, 226) lock into the recesses (e.g. 228) under a bias for secure attachment of the opaque cover (2) onto the transparent door (1). In one embodiment, the clips (220, 222) are implemented with a spring loaded pivot connection to the clamps portions (224, 226), for holding the clamp portions (224, 226) in their vertical position for securing the opaque door (2) onto the transparent door (1). As will be appreciated by a

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Prior Art A

person skilled in the art, the biased clamp portions can be pulled out of the recesses (e.g. 228) against the bias, for detachment, as will be described in more detail below.

By attaching a seal (101a) which is the same as a seal (101b) installed between the transparent door (1) and refrigerator (N) also between the opaque cover (2) and the transparent door (1), we made the refrigerator perfectly tightly shut and more heat insulated. Portions (not shown) of the same seal (101b) are preferably provided on the clamp portions (224, 226), such that the peripheral seal between the refrigerator (N) and the transparent door (1) is complete when the opaque cover is attached. Similarly, separate seal portions can be provided in the recesses (e.g. 228) if the refrigerator is used without the opaque cover (2)

The seals (101a, 101b) have rubber magnetic inside, to further facilitate attachment of the opaque cover (2) to the transparent door (1), while still allowing detachment if desired. On the drawing, (30) denotes a shelf which will be put into the refrigerator (N).

Just like described, the invention has a transparent opening and shutting door (1) and an opaque cover (2) installed two-fold.

The opaque cover (2) can be attached or detached at the front of the refrigerator (N). We can get a commercial refrigerator (N) which shows the storage inside when we detach the opaque cover (2) at the outside of the transparent door (1) or we would have a home refrigerator (N) whose content cannot be seen through from outside.

With reference to Figure 2, we attached the seal (101a) around the inside perimeter of the opaque cover (2) as double heat insulation and for the facilitating releasable attachment of the cover (2). This is the same rubber as the seal (101b) installed between the transparent door (1) and the refrigerator (N) and the seal has a rubber magnetic inside.

For detaching of the cover (2) from the transparent door (1), the transparent

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Document A – Client's write-up of his invention (11/16)

Prior Art A

door (1) with the opaque cover attached thereto must first be opened partially, to allow access to the biased clamp portions (e.g. 224). In the closed position, the biased clamp portions (e.g. 224) of the clips (e.g. 220) are inaccessible as they are received in the recesses (e.g. 228) on the inner peripheral surface of the transparent door (1) as described above. Additionally, the clips (220, 222) are covered by the top cover (10) and bottom skirt (230) respectively (compare Figure 1). This advantageously prevents removal of the opaque cover (2) from the refrigerator when the transparent door (10 with the attached opaque cover (2) is in the closed position, and ensures that the appearance of the refrigerator (N) is substantially identical to that of existing home use refrigerators.

The partial opening of the door (1) is followed by pivoting the biased clamp portions (e.g. 224) simultaneously or sequentially to release them from the recesses (e.g. 228) in the inner peripheral surface of the transparent door (1), and partially rotating the opaque cover (2). This then provides leverage to dislodge the rotating axes recesses (e.g. 202) from the axes (e.g. N1a). As a result, the opaque cover (2) can be detached from the transparent door (1) for conversion of the refrigerator (N) for commercial use.

For attachment of the opaque door (2) to the refrigerator (N), the above steps are executed in reverse order, for conversion of the refrigerator (N) for home use.

The refrigerator (N) in our description includes general refrigerators with a cold storage and a freezer, or cooling only or freezing only devices as well.

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Document A – Client's write-up of his invention (12/16)

Prior Art A

CLAIM

1. A multipurpose refrigerator comprising:

a transparent door; and

an outer opaque detachable cover so that users can put the cover on or take the cover off according to the place they use the refrigerator.

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Document A – Client's write-up of his invention (13/16)

Prior Art A

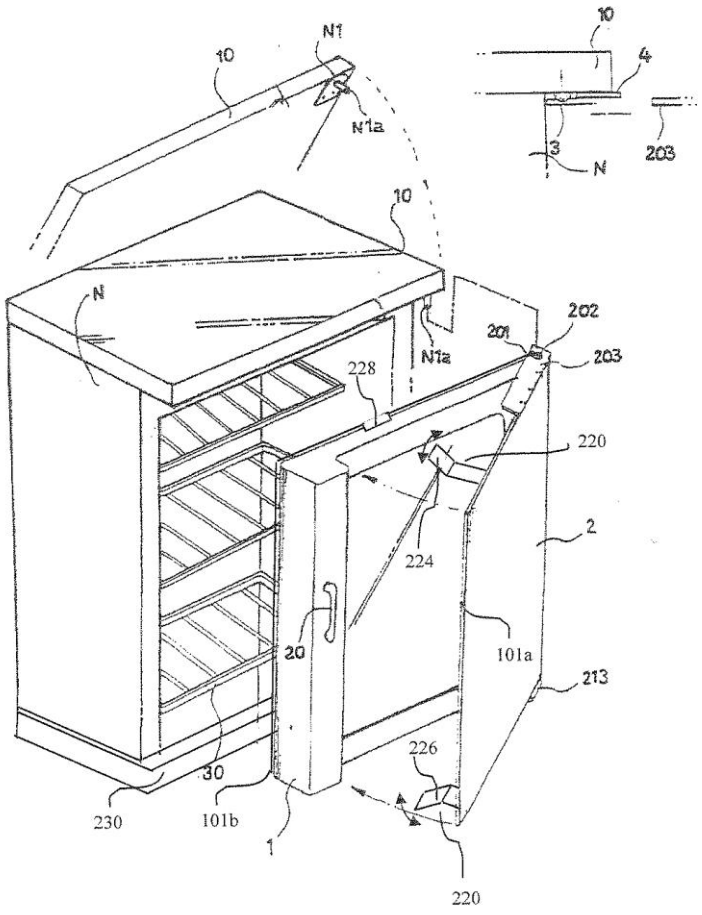

FIG.1

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Document A – Client's write-up of his invention (14/16)

Prior Art A

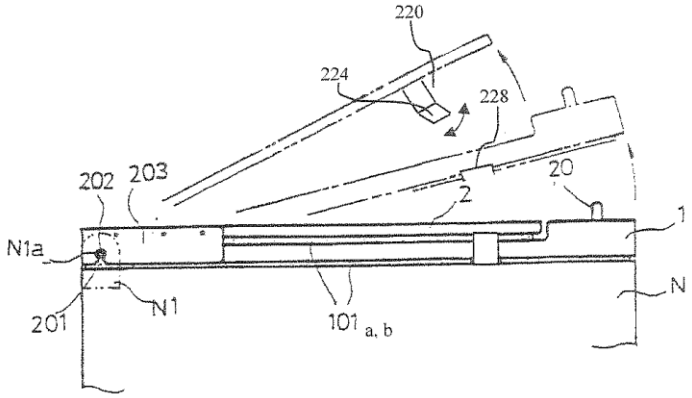

FIG. 2

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Document A – Client's write-up of his invention (15/16)

Prior Art B

1

SEE-THROUGH, SMOKED GRAY, PLEXIGLASS REFRIGERATOR DOOR

This invention relates generally to electrically operated refrigerators such as are used in a home.

It is generally well known that upon occassion a person cannot quickly locate a particular item of food inside a refrigerator so that while he is hunting for the same, the refrigerator door is kept open, which dissipates the cool air outwardly so that this thermal loss then causes the refrigerating mechanism to start up so to replace the loss of coldness. Opening the door in such manner frequently and for long periods results in an increase of electrical energy consumed so that it reflects in an increase in the electric bill of a household. This situation is objectionable and is therefore in want of an improvement.

Accordingly, it is a principal object of the present invention to provide a refrigerator having a transparent front door through which a person can see so to locate items before opening the door, thus keeping the door open for only a minimum length of time thereafter.

Another object is to provide a see-through, smoked gray, Plexiglass refrigerator door having a switch button on its outside so a person can light up the refrigerator interior while the door is still closed so to find a particular item.

Still another object is to provide a see-through, smoked gray, Plexiglass refrigerator door which can be made to replace conventional doors of existing home refrigerators, as well as being incorporated into new refrigerators while being manufactured.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated and described within the scope of the appended claims.

FIG. 1 is a perspective view of a refrigerator incorporating a see-through, smoked gray, Plexiglass door, shown closed.

FIG. 2 is a fragmentary similar view with the door opened and showing the door construction.

FIG. 3 is a diagram showing that an external push button can be provided to illuminate the refrigerator interior prior to opening the door so to locate specific items before the door is opened.

Referring now to the drawing in greater detail, the reference numeral 10 represents a see-through, smoked gray, Plexiglass, refrigerator door according to the present invention and which is installed on a front side 11 of a home refrigerator 12. The door is pivotally mounted on hinges 13 along one vertical side edge, and includes a handle 14 along an opposite vertical side edge for pulling the door open, so to gain access to the refrigerator interior 15.

The door includes parallel inner and outer walls 16 and 17 having a sealed insulating air space 18 therebetween. The edges of the walls 16 and 17 are accordingly

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integral with opposite side edge walls 19 and 20 as well as upper and lower edge walls 21 and 22 for hermetically sealing the space 18. A rubber gasket 23 is secured to a peripheral area of the inner wall 16 for abutting against the metal case 24 of the refrigerator; the gasket being impregnated with permanent magnet particles for holding the door in a closed position, in a manner of conventional refrigerators.

The door, thus manufactured in one integral piece, is molded from smoked gray, Plexiglass material so to permit seeing therethrough while yet being of a soft subtle hue so to keep exterior light from penetrating therethrough and also not readily and clearly displaying the food content of the refrigerator when not wanted to be seen.

As shown in FIG. 3, a lamp 25 conventionally operated automatically by a switch 26 when the door is opened, is also operated manually in the present invention by a switch 27 activated by a push button 28 on a front side of the door handle; the switches being in parallel circuits to each other.

In operative use, it is now evident that a person can see through the door 10 so to see food 29 placed upon shelves 30 of the cooler compartment 31. Also food 32 can be seen inside the freezer compartment 33 if this compartment also includes a seethrough front door 34 made similarly to door 10, as shown in FIG. 1.

For better visibility of the refrigerator interior, the lamp 25 can be lighted by simply depressing the switch button 28.

Thus a more attractive, more useful and more modern looking refrigerator door is provided.

While certain novel features of this invention have been shown and described and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing from the spirit of the invention.

I claim:

1. A household refrigerator including a case having a cooler compartment and a freezer compartment cooled by a refrigerating mechanism, and a front door of said refrigerator being made from a transparent Plexiglass material that is tinted smoke gray so that visibility therethrough is not readily clear from an outside when an interior of said refrigerator is not illuminated; said door including a sealed, central, air space insulation between inner and outer wall thereof; said door being mounted upon hinges and including a pull handle, a magnet-impregnated gasket mounted on an inner side of said door for abuttment with a metal front face of said refrigerator case; a lamp inside said case being in a circuit with a first switch automatically operated when said door is opened and is also in a circuit with a second switch manually operated by a pushbutton on an outer side of said door, said lamp providing illumination means inside said refrigerator so to allow clear visibility readily through said transparent, smoke gray Plexiglass door.

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Document A – Client's write-up of his invention (16/16)

Prior Art B

FIG. 1

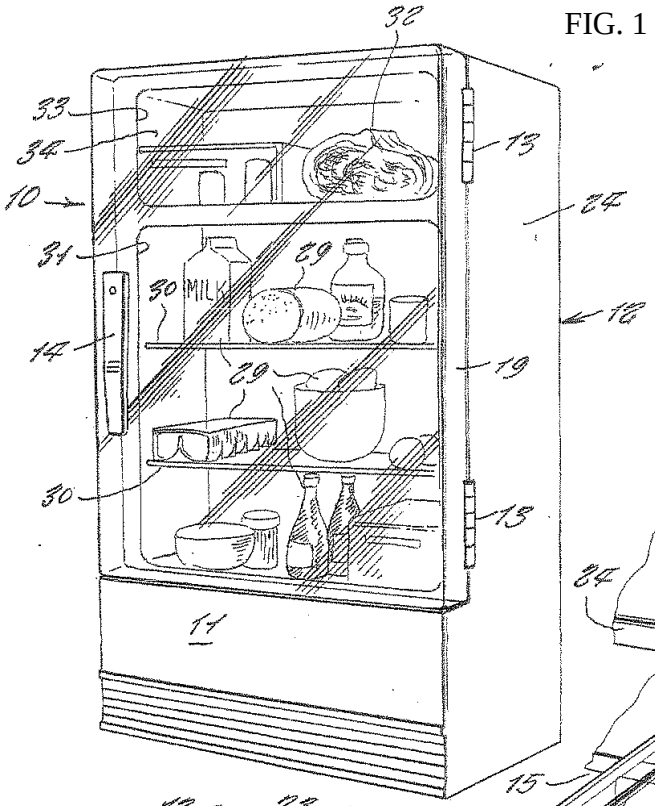


FIG. 2

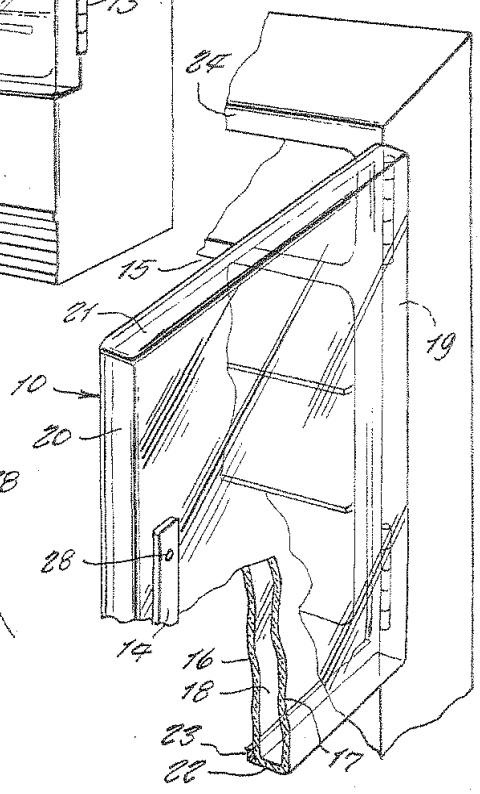
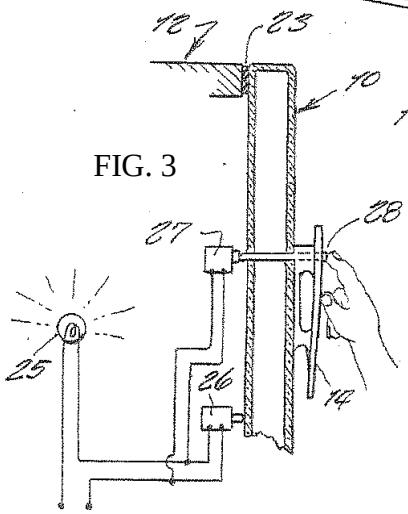


FIG. 3



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