

## **CABINET DOORS**

The present invention relates to cabinet doors. In particular, it relates to cabinet doors for use in a retail display environment.

5 In recent times there has been a drive for government bodies to restrict the display of certain products in a retail environment whilst still allowing for their sale to a consumer. For example, certain governments are placing limitations on the ability for retailers to display tobacco products.

Introduction of such restrictions can cause difficulties for retailers.

10 Firstly, many have invested heavily in display cabinets for displaying such products and face the potential need to replace such display cabinets in order to meet the requirements of such restrictions.

In addition, restrictions on display can prevent a retailer from being able to make a consumer aware of new or improved products.

15 Furthermore, without appropriate cabinet structures in place for the holding of such products, it can be difficult for the retailer to ensure that display of the products is prevented at all times except for when a product is being obtained for sale to a customer, leaving the retailer at risk of contravening the restrictions.

20 EP 2 565 356 A1 discloses a door unit for a display cabinet comprising a frame for holding two sliding doors, and linking means in the form of a tooth and notch arrangement for selectively linking the two doors such that when a first one of the doors is opened the second one of the doors is pulled open also and when the second one of the doors is opened the linking means disengages such  
25 that the first door remains closed.

Such a solution proves particularly satisfying in terms of functionality of the door unit and efficiency in opening/closing the doors to hide products from sight. However, the tooth and notch linking mechanism may suffer significant wear and can become noisy during use. In addition, such a linking mechanism  
30 remains accessible from the exterior of the door unit and can therefore easily be altered, not to mention affect the aesthetic character given to the door unit.

The present invention seeks to address the above and other problems.

According to the present invention there is provided a door unit for a display cabinet, the door unit comprising:

a frame for holding, in use, at least an upper and a lower sliding door; and linking means for selectively linking the two doors such that when a first one  
5 of the doors is opened the linking means engages with the second one of the doors to pull it open also and when the second one of the doors is opened the linking means disengages such that the first door remains closed, wherein the linking means is configured to be concealed from a user. Preferably, the linking means may be concealed from the user in any position of the doors.

10 The doors may be positioned adjacent to one another and/or arranged such that they slide in the same direction. The linking means, contrary to the tooth and notch or crenelated arrangement known from the prior art, is arranged with respect to the sliding doors and frame of the door unit such that they enable the two doors to engage with one another when the first door is opened and  
15 disengage with one another when the second door is opened, whilst always remaining concealed from the person actuating the doors on the frame. This has the particular advantage that the visible areas of the door unit of the invention remain plain and free of any visible mechanism at all times, providing a neater and cleaner design. It can also reduce the possibility of anything becoming  
20 trapped in the linking means.

In a preferred embodiment of the invention, the at least upper and lower sliding doors slide on the frame within the same vertical plane.

In such a preferred embodiment, the linking means may also engage in the same vertical plane as the sliding plane of the doors. This has the particular  
25 advantage of providing a very compact door unit, whilst maintaining functionality, which does not hinder the storing space within a cabinet equipped with the door unit of the invention.

Advantageously, the linking means may be mounted to a back side or fixed in a longitudinal cross section of the upper and lower sliding doors  
30 respectively such that they are concealed from a user when the door unit is mounted on a cabinet. Preferably, the linking means may be concealed from the user in any position of the doors.

In a further preferred embodiment, the linking means comprises abutting members configured to engage with each other when the first one of the sliding doors is opened to open the second one of the sliding doors simultaneously and not to engage when the second one of the sliding doors is opened to leave the first one of the sliding doors closed.

In such a preferred embodiment, the abutting members may be integral with at least a first runner unit attached to the first one of the sliding doors and slidably mounted to the frame and at least a second runner unit attached to the second one of the sliding doors and slidably mounted to the frame.

Still preferably, the runner units may comprise rollers or wheels mounted to a common rail in the frame, the rail preferably having a substantially C-shaped cross-section.

Still preferably, the rollers or wheels of each of the runner units may be mounted into a same track of the rail, the rail having preferably a substantially U-shaped cross-section. Advantageously, the rail may be provided within a transverse member of the frame located between the two sliding doors and within the same vertical sliding plane as the two sliding doors.

In a further preferable embodiment of the door unit of the invention, the abutting members of the linking means comprise dampening and/or absorbing means to absorb shocks and noise upon engagement. Such dampening and/or absorbing means may preferably comprise rubber or silicon gaskets, pieces or sleeves or any other soft plastic element that is capable of absorbing shocks and that is cheap to manufacture and easy to replace upon wear.

The frame of the door unit of the invention may be arranged such that it can be retro-fitted over a standard display cabinet.

The unit may further be provided with one or more door closing mechanisms to enable automatic closing of the one or more doors. The closing mechanism may comprise one or more of a hydraulic closing mechanism, biased weight closing mechanism, weighted pulley, spring and ratchet, or coiled spring-driven mechanism.

Preferably the doors are formed from an opaque material.

The unit and/or the frame and/or the doors may be arranged such that advertising or display orientated material can readily be fixed thereto.

With the unit of the present invention it is possible for a retailer to selectively display alternative products to a user on an automatic basis while obtaining the product requested by the consumer. In addition, it is possible for the retailer to meet display restriction requirements without having to install  
5 completely new cabinets through the retro-fitting of a unit of the present invention.

It is also possible for the retailer to ensure that, through the automatic closing of the doors, the product is only displayed when being accessed, such that no door can inadvertently be left open and products left on continuous  
10 display.

According to the present invention, there is also provided a display cabinet comprising a housing containing one or more shelves and further comprising a unit of any preceding claim retained on the housing.

Examples of the present invention will now be described with reference to  
15 the accompanying drawings, in which:

Figure 1 is a front view of a unit according to the present invention including two upper and two lower sliding doors;

Figures 2A and 2B show opening positions of vertical pairs of upper and lower doors of the unit of figure 1;

20 Figure 3A and 3B show a back view of the door unit in the opening positions as shown in figure 2A and 2B respectively;

Figure 4 shows an enlarged view of the linking mechanism between upper and lower doors of the unit in the opening positions of figure 3;

Figure 5 shows a back view of the unit of figure 1 with the doors in closed  
25 positions; and

Figure 6 shows an enlarged view of the linking mechanism between upper and lower doors of the unit in the closed positions of figure 1;

Figures 7 and 8 show a front and back view of the door of figure 1 respectively in the opening position of only one of the doors, the other door  
30 being closed.

Referring to figure 1, a door unit 1 according to the present invention comprises a frame 2 formed from top, intermediate and bottom transversal rail members 3, 4, 5 and vertical side members 6, 7 connected to the ends of the

transversal rail members 3, 4, 5. The door unit 1 may be attached, in use, to a cabinet frame which is shipped as a unit or may alternatively be configured to be retro-fitted around an existing display cabinet which has already been installed.

Two upper doors 8, 9 are slidably mounted onto the top and intermediate transversal rail members 3, 4 and two lower doors 10, 11 are slidably mounted onto the intermediate and bottom transversal rail members 4, 5. Preferably, the upper and lower doors are made out of an opaque material, for example, plain or reconstituted wood or from extruded or moulded hard plastic material such as polyvinylchloride, PEEK, polyurethane or the like.

According to the invention, the upper and lower doors 8, 9, 10, 11 are mounted onto the transversal rail members 3, 4, 5 in pairs consisting of one upper and one lower door. Each pair of doors 8, 10; 9, 11 slides in respective vertical sliding planes P1, P2 offset from one another. Accordingly, as shown in figures 1 and 2A, a first pair made of upper and lower doors 9, 11 is slidably mounted in a first or front sliding plane P1 while, as shown in figures 2B and 3A, a second pair made of upper and lower doors 8, 10 is slidably mounted in a second or back sliding plane P2. As is readily understandable from figures 1 and 2, vertical sliding planes P1 and P2 are parallel and offset such that the upper sliding doors 8, 9 can slide simultaneously along the top and intermediate transversal rail members 3, 4 in their respective sliding plane P1, P2. Similarly, the lower doors 10, 11 are allowed to slide on the intermediate and bottom transversal rail members 4, 5 in their respective planes P1, P2. This is preferably achieved by the transversal rail members 3, 4, 5 each comprising two sliding tracks, one first or front track 3a, 4a, 5a, for example of a classic C-shaped cross section, to support doors 9, 11 in the front sliding plane P1 and one second or back track 3b, 4b, 5b for example, of a classic C-shaped cross section and symmetrical to the front track to support doors 8, 10 in the back sliding plane P2.

The sliding doors 8, 9, 10, 11 slide on the transversal rail members 3, 4, 5 between closed positions, as shown in figure 1, and open positions shown in figures 2A and 2B. When in the closed position and when the door unit 1 has been fitted onto a cabinet, contents of the cabinet to which the frame 2 is attached are not visible to a consumer.

As shown in figures 3 to 5, in a preferred embodiment of the door unit 1 of the invention, the sliding doors 8, 9, 10, 11 are each slidably mounted to the transversal rail members 3, 4, 5 by means of two upper and two lower runner units 12. Each one of the runner units 12 can be identical, as shown in the figures, and comprise a mounting plate or body 121 fastened by any suitable means (screws, nails or the like) to a back surface of a door that supports a roller/wheel 122 that engages with and is preferably housed in one of the front or back rail tracks 3a, 4a, 5a; 3b, 4b, 5b of the transversal rail members 3, 4, 5. As is more clearly shown in figures 5 and 8, showing a back view of the door unit 1 in a closed position of all sliding doors 8, 9, 10, 11, the runner unit 12 connected to doors 9, 11 sliding within the same front sliding plane P1 has its wheels 122 lodged into the front track 3a, 4a, 5a of the transversal rail members 3, 4, 5 while the runner unit 12 connected to doors 8, 10 sliding within the same front sliding plane P2 has its wheels 122 lodged into the back track 3b, 4b, 5b of the transversal rail members 3, 4, 5.

It must be understood that the runner units 12 may have a different shapes and/or structures than that described and shown in the figures. For example, the wheels or rollers 122 could be fixed on runner units 12 fitted into a housing made into or within the cross-section of each of the door to improve the compactness of the system and prevent the runner units from contacting the goods stored in the cabinet while the doors slide.

According to the present invention and as represented in details in figures 4 and 6, the door unit 1 further comprises linking means 13 for selectively linking the paired upper and lower doors 8, 10 and 9, 11 in each of the back and front sliding planes P1, P2. In a preferred embodiment represented in the figures the linking means 13 is advantageously part of and integral with at least one of the runner units 12 of each doors and comprises abutting members or stoppers 123 extending in front of the wheel 122 of the runner units 12 (or otherwise on the side of the runner unit, which may contact another runner unit while the doors slide). To absorb shocks and noise upon abutting of the linking means 13 of the upper and lower doors of a pair sliding in a same plane P1, P2 the abutting members are equipped with dampening means 14 preferably comprise rubber or silicon gaskets, pieces or sleeves or any other soft plastic element.

To ensure selective engagement between upper and lower doors sliding in the same plane P1, P2 at least one runner unit 12 of each upper door 8, 9 sliding in the intermediate transverse rail member 4 and at least one runner unit 12 of each lower door 10, 11 sliding in the intermediate transverse rail member 4 must be mounted to the corresponding door such that their abutting members 123 engage with each other in abutment in the closed position of the doors (see figures 3A and 5).

Because of the linking means 13 of the invention, and as can be seen in figures 3A to 8 in particular, when a first one of the doors, i.e. a lower door 10, 11 as shown in the figures, is opened the linking means 13 engages with the second one of the doors, i.e. the upper doors 8, 9, to pull it open. Conversely, when one of the upper doors 8, 9 is opened (see figures 7 and 8) the linking means 13 disengages such that the lower door 10, 11 of the corresponding pair remains closed. Advantageously according to the invention the linking means 13 are configured to be concealed from a user in any position of the doors 8, 9, 10, 11 to prevent any alteration thereof and provide a plain visible front surface for the doors 8, 9, 10, 11.

It should also be appreciated that the linking means between the two doors may be configured in an alternative arrangement to that shown in the figures, such that the lower door always opens, even when the upper door is opened.

Further, means may be provided on one or more of the sliding doors to ensure that the doors close automatically when not being accessed. With reference to figures 3A to 8 example arrangements that could be used to achieve this can be a trail mechanism 15 fixed to the back surface of door 8 with a rope or cable tensed over a pulley 16 on the edge of the door 8 with the free end thereof connected to the closest edge of the second upper door 9 in the closed position of the doors. Such a configuration ensures that when any of the upper doors 8, 9 are opened this pulls the rope connected to the trail 15, which automatically rewinds the rope once the opened door is released free or closed by a user. Similar arrangements may also be used for automatically reclosing the lower doors 10, 11 of the door unit 1.

Other examples of closing mechanisms may include a hydraulic piston arranged by a sliding door in a closed position or a pivoting weight configuration which, again, biases the sliding door towards a closed position.

- 5 As will be appreciated from the above description, the present invention provides a set of cabinet doors that enables a retailer to simply and effectively meet changing legislation in respect of the display of certain products. It also enables a retailer to position products in the most appropriate and consistent manner for gantry and stock management and enables the retailer to monitor the content throughout the cabinet.

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## **CLAIMS**

1. A door unit for a display cabinet, the door unit comprising:
  - 5 a frame for holding, in use, at least an upper and a lower sliding door; and linking means for selectively linking the two doors such that when a first one of the doors is opened the linking means engages with the second one of the doors to pull it open also and when the second one of the doors is opened the linking means disengages such that the first door remains closed, wherein the linking
  - 10 means is configured to be concealed from a user, wherein the linking means comprise abutting members configured to engage in abutment with each other when the first one of the sliding doors is opened to open the second one of the sliding doors simultaneously and not to engage when the second one of the sliding doors is opened to leave the first one of the sliding doors closed,
  - 15 characterized in that the abutting members are integral with at least a first runner unit attached to the first one of the sliding doors and slidably mounted to the frame and at least a second runner unit attached to the second one of the sliding doors and slidably mounted to the frame.
- 20 2. The unit of claim 1 wherein the doors are arranged such that they slide in the same direction.
3. The unit of claim 1 or claim 2, wherein at least the upper and lower sliding doors are configured to slide within the same vertical plane .
- 25 4. The unit of claim 3, wherein the linking means also engages in the same vertical plane as the sliding plane of the doors.
5. The unit of any preceding claim, wherein the linking means is mounted to
- 30 a back side or fixed into a longitudinal cross section of the upper and lower sliding doors respectively such that they are concealed from a user when the door unit is mounted onto a cabinet.

6. The unit of any preceding claim, wherein the runner units comprise rollers or wheels mounted to a common rail in the frame, preferably located between the upper and lower doors.
- 5 7. The unit of claim 6, wherein the rollers or wheels of each of the runner units are mounted into a same track of the rail, the rail preferably having a substantially C-shaped cross-section.
8. The unit of claim 7, wherein the rail is provided within a transverse rail member of the frame located between the at least upper and lower sliding doors and within the same vertical sliding plane as the two sliding doors.
- 10 9. The unit of any preceding claim, wherein the abutting members of the linking means comprise dampening means to absorb shocks and noise upon engagement.
- 15 10. The unit of claim 9, wherein the dampening means preferably comprise rubber or silicon gaskets, pieces or sleeves or any other soft plastic element.
- 20 11. The unit of any preceding claim, wherein the frame is arranged such that it can be retro-fitted over a standard display cabinet.
12. The unit of any preceding claim, further comprising one or more door closing mechanisms to enable automatic closing of one or more of the doors.
- 25 13. A display cabinet comprising a housing containing one or more shelves and further comprising a unit of any preceding claim retained on the housing.