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GLASS CURTAINS HG SYSTEM

BACKGROUND OF THE INVENTION:

Field of the invention

This invention relates to a system of panels able to divide, isolate or compartmentalise spaces via a flexible system based on but not restricted to glass and aluminium. The invention is directed to the technical area of construction, more precisely in the area of enclosures to divide spaces and to enclose spaces such as terraces, balconies, offices, restaurants etc.

Description of related art

Within the above described technical area, there are well known systems of enclosure mainly based on a set of panels that hang from upper rails and that move with the help of bearings and other mechanical elements. These devices present several problems and limitations related to not only the reliance on gears, bearings and external aids, but also from the fact that the weight of the panels rests on the upper rails and not on the floor. For example, in all of these systems the bearings and gears wear over time and the external aid which makes it possible to rotate the panels through 90 degrees fails to provide the necessary support. This initiates periodic maintenance and ongoing problems with the system. Moreover the weight of the panels can result in malformations on the upper rail at the point of contact on which the weight of these panels rests. This also initiates maintenance problems due to tolerances being altered in the opening mechanisms. Accordingly the useful life of such enclosure systems is considerably limited.

Brief Summary of Invention

This invention aims to solve the problems mentioned above by developing an enclosure system in which the weight of the panels rests and moves on the PTFE strips and the HG components plus the use of solid components eliminates the need for bearings and gears and external mechanical aids. The solution presented below is based on the panels that move individually being guided inside the rail by non-rotating guides which in conjunction with fixed components in the upper rail eliminate any possibility of the panels being displaced and operating incorrectly. In this way the new invention eliminates all of the failings of other mechanically dependent systems. This invention also allows for unlimited numbers of panels in any system plus the ability to negotiate angles. The combination of PTFE weight bearing strips and the HG components allows for heavier panels to be employed than other systems. The panels move along the rails with the help of guides and the weight of the whole structure rests and moves on the PTFE strips. For this reason, the only function of the upper rail is to guide the movement of each panel and to allow the rotation at the opening position and not to

support the weight of the system. This combination allows for the panels to be positioned in a variety of intermediary positions, depending upon the requirement of the user.
There is an aluminium profile attached to both the top and bottom of each panel which has a trapezoid structure to allow the components and guides to be installed securely. Each panel has five components – 3 on the upper profile and 2 on the lower profile. These are:
a) Top Flag (fig. 9 & 10) which is a single construction that has a disc of 30mm to allow for accurate spacing of the panels. There are also two fixing holes in the lower portion to accommodate 6mm set screws.

b) Top Guide (fig.13 No. 63) which is a single construction with a vertical cylinder of 13.5mm with two holes to accommodate 6mm set screws.

c) HGP (fig. 26 & 27) which is a single construction that is shaped to interact with HGT upon opening and closing of the system

d) Bottom Flag (fig. 3: 15 & 16) which is two individual pieces of solid components 16 interacts with 15 to form the Bottom Flag.

e) Bottom Guide (fig. 18 & 19) which is a single construction with a maximum diameter of 18mm with an internal diameter of 13.5mm.

f) Turning Mechanism (fig. 23) which is a single construction with recesses which have a radius of 15mm equally spaced at 30mm along its entire length.

g) HGP (fig. 24 & 25) which is a single construction that is formed to interact with HGP when opening and closing the system.

h) Rail (fig. 7 & 8) which is an aluminium construction that is substantially rectangular or squared cross section with its lower side defining an elongated through which the components pass. The rail also has a substantially rectangular or squared cross section opening on the upper side to allow for either PTFE or a weather-proofing strip.

i) Profile (fig. 6) which is an aluminium construction that is designed to accept the panels and to accept in its trapezoid section the components of the system. The design also allows for the profile to make perfect contact with the PTFE of the lower rail and weather-proofing strip on the upper rail.

j) Stop (fig. 20 & 21) which is a square components made of polyamide or similar material which has a dual recess to accept a fixing screw which anchors the block to the system at the opening section.

Brief Description of the Drawings

Fig. 1 - shows panels in the closed position
Fig. 2 - shows panels in the half-open position
Fig. 3 - cross section of rail and profile showing position of Top Flag, Bottom Flag and Turning Mechanism
Fig. 4 - cross section of rail and profile showing the Top Guide and Bottom Guide
Fig. 5 - cross section of rail and profile showing Fixing Screws and Stops when employed to fix the first panel with the Top Lock system
Fig. 6 - Profile
Fig. 7 & 8 - Rail
Fig. 9 & 10 - Top Flag
Fig. 11 & 12 - Plate for Top Guide including Screw Holes
Fig. 13 - cross section showing Top and Bottom Guides and dimensions of system
Fig. 14 & 15 - Bottom Flag Bush
Fig. 16 & 17 - Top Guide Bush
Fig. 18 & 19 - Bottom Guide
Fig. 20 & 21 – Stop
Fig. 22 & 23 – Turning Mechanism
Fig. 24 & 25 – HGT
Fig. 26 & 27 – HGP

Claims

1. The invention operates by moving the panels manually between the rails and opening at a predetermined point by rotating through 90 degrees to stack and occupy the minimum space. The various components, both in the rails and profile, ensure a safe and secure operation.

2. The Stop (Fig.13) in the Upper Rail (Fig.23) is positioned at a calculated distance from the end of the rail.

3. The Turning Mechanism (Fig.22 & 23) is located adjacent to the Stop; this determines the spacing required for the rotation of the panels on the access created by the Top Flag (Fig.9 & 10) and the Bottom Flag Bush (Fig.14 & 15).

4. To guarantee that the panels remain contained inside the rails HGT (Fig. 24 & 25) and HGP (Fig. 26 & 27) are deployed in the rail and profile to interact and support the panel as it initiates its rotation.

5. The HGT is positioned at a predetermined distance from the Stop with the HGP located in the Upper Profile which is adjustable to allow one HGT to service two HGPs i.e. panels. The leading edge of the HGT is always angled towards the Turning Mechanism end of the Top Rail. This angle is designed to mimic the arc of the panel as it rotates on its axis accepting the HGP which holds the panel until the Turning Mechanism is connected.

6. The Top Flag locates in the Turning Mechanism and from a rotation of 5 degrees holds the panel securely throughout its rotation.

7. This combination of the Turning Mechanism, Top Flag, HGT and HGP is unique and allows for the firs time a system to operate without any aid or guide external to the rail.

8. The panels are aligned by the deployment of the Top Guide Bush (Fig.16 & 17) and Bottom Guide (Fig.18 & 19) positioned towards the opposite end of the panel to the two Flags and the HG System.

9. The Top Guide is designed to locate the leading end of the panel as it moves along the rail and exits through a slot in the rail when the panel rotates to its stacking position.

10. The Bottom Guide is unique in the Frameless Glazing Industry in that it does not require an opening slot in the rail to exit. This allows the system to be totally recessed in the floor.

11. The movements and displacement of each panel is manually carried out by a person. The rotation and displacement of each panel will allow for easy cleaning of both faces.

12. The strips on which each panel rests and moves along the rails are made of PTFE, since this material allows an easy movement of the panels with no mechanical properties resistant to abrasion and wear.

13. These PTFE strips are placed in the Lower Rail, the behaviour of the PTFE in touch with a hard painted surface allows for the simple and easy movement of the system.