

A Roller Shutter and a Slat Member for Same

This invention relates to a roller shutter and a slat member for same. In particular, this invention relates to a roller shutter incorporating non-opaque components in the slat members, thus allowing viewing of an object behind the roller shutter.

Conventional roller shutters are made of interlocking slats which are usually made of metals. While roller shutters are effective for security purposes, as the material with which the slats are made is opaque, the objects behind the shutter cannot be viewed. However, for shops in commercial complexes or situated along the streets, it may be desirable to enable passers-by to view the goods available for sale in the shops. Improvements have thus been made to such conventional roller shutters by incorporating non-opaque, e.g. transparent, components in the slats, thus allowing the interior of the shop to be visible. Such transparent components may, for example, be made of polycarbonate or tempered glass.

However, most of such improved roller shutters are rather complex in construction, and thus not easy to manufacture. The strength of such roller shutters may also be compromised in view of the incorporation of such transparent components.

It is thus an object of the present invention to provide a roller shutter in which the above shortcomings are mitigated, or at least to provide a useful alternative to the trade and public.

According to a first aspect of the present invention, there is provided a roller shutter comprising at least first, second, third and fourth engagement members, wherein said first engagement member is engaged with and swivelable relative to said third engagement member, and wherein said second engagement member is engaged with and swivelable relative to said fourth engagement member, wherein at least one non-opaque window member is secured to said first and second engagement members, wherein said window member is secured to at least said first engagement member *via* a first intermediate member, wherein said roller shutter includes means for receiving at least a side end of said window member, characterized in that said receiving means includes two interlocking receiving members.

According to a second aspect of the present invention, there is provided a slat member for a roller shutter, wherein said slat member includes a first engagement member and a second engagement member, wherein at least one non-opaque window member is fixedly secured to said first and second engagement members, wherein said window member is secured to at least said first engagement member *via* a first intermediate member, wherein said slat member includes means for receiving at least a side end of said window member, characterized in that said receiving means includes two interlocking receiving members.

An embodiment of the invention will now be described, by way of example only, and with reference to the accompanying drawings, wherein:-

Fig. 1 is a front view of a roller shutter according to the present invention;

Fig. 2 is an enlarged view of the portion of the roller shutter marked in the circle

C in Fig. 1;

Fig. 3A is a sectional view of the roller shutter taken along the line A-A in Fig. 2;

Fig. 3B is a sectional view of the roller shutter taken along the line B-B in Fig. 2;

Fig. 4 is an exploded view of a shutter slat of the roller shutter shown in Fig. 1;

Fig. 5A is an end view of a female slat member of the roller shutter shown in Fig.

3A;

Fig. 5B is a perspective view of the female slat member shown in Fig. 5A;

Fig. 6A is an end view of an engagement piece of the roller shutter shown in Fig.

Fig. 3B;

Fig. 6B is a perspective view of the engagement piece shown in Fig. 6A;

Fig. 7A is an end view of a male slat member of the roller shutter shown in Fig.

3A;

Fig. 7B is a perspective view of the male slat member shown in Fig. 7A;

Figs. 8A and 8B show the engagement and relative movement between the female slat member and the male slat member shown in Fig. 3A;

Fig. 9A shows a side piece member shown in Fig. 3A;

Fig. 9B shows the inter-locking of two side piece members shown in Fig. 9A to form a side piece;

Fig. 9C is an enlarged view of the part marked with the circle D in Fig. 9A;

Fig. 9D is an enlarged view of the part marked with the circle E in Fig. 9A;

Fig. 9E is an enlarged view of the part marked with the circle F in Fig. 9B;

Fig. 10A shows a modified embodiment of a roller shutter according to the present invention;

Fig. 10B is an enlarged view of the part marked with the circle G in Fig. 10A;

Fig. 10C is an enlarged side view of the part marked with the circle H in Fig. 10A;

Fig. 10D is an enlarged perspective view of the part marked with the circle J in Fig. 10A;

Fig. 10E is a front view of the part of the roller shutter shown in Fig. 10D; and

Fig. 10F is an end view of the part of the roller shutter shown in Fig. 10E.

Fig. 1 shows a roller shutter according to the present invention generally designated as 10. Mechanical or electrical mechanisms (not shown) are provided for opening and/or shutting the roller shutter 10 in the usual manner. The roller shutter 10 includes a number of slats 12, of which only one full slat 12 is shown in Fig. 2. Except the head slat and the end slat, each of the slats 12 is engaged with and swivelably movable relative to two adjacent slats in a manner to be discussed below.

As shown in Figs. 3A, 3B and 4, each slat 12 includes an elongate male slat member 14 and an elongate female slat member 16. The male slat member 14 includes an elongate male portion 18 which is receivable within an elongate female recess portion 20 (see Fig. 5A) of the female slat member 16. Because of the configuration and size of the male portion 18 and the female recess portion 20, the male slat member 14 and the female slat member 16 can only be engaged with or disengaged from each other by sliding one relative to each other along the axis L-L as shown in Fig. 2.

A non-opaque (e.g. transparent) window 22 made of plastics, polycarbonate or

tempered glass is fixedly secured to and between the male slat member 14 and the female slat member 16. As shown in particular in Fig. 3B, the window 22 is secured to each of the male slat member 14 and the female slat member 16 *via* an elongate engagement piece 24. The engagement piece 24 is substantially T-shaped in cross section, with a wider head portion 26. The engagement piece 24 is receivable with an elongate recess 28 of the male slat member 14 or an elongate recess 30 of the female slat member 16. Again, by reason of the configuration and size of the recesses 28, 30 and the engagement piece 24, the engagement piece can only be engaged with or disengaged from the recesses 28, 30 by relative sliding movement.

As it is not desirable to produce or install windows 22 which are too lengthy, the whole width of the roller shutter 10 includes a number of windows 22. In order to enhance the appearance and safety of the roller shutter 10, side pieces 32 are installed to accommodate side ends 34 of two adjacent windows 22.

Figs. 5A and 5B show in more detail the structure and configuration of the female slat member 16, while Figs. 7A and 7B show in more detail the structure and configuration of the male slat member 14. As can be seen in Fig. 8A and 8B, when properly engaged, the male slat member 14 and the female slat member 16 may be swiveled relative to each other by an angle θ of up to 69° .

Returning to Figs. 6A and 6B, such show in more detail the engagement piece 24. The engagement piece 24 also includes a recess portion 36 into which part of the window 22 may be received. The window 22 is fixedly secured to the engagement

piece 24 by adhesives. In order to enhance the engagement between the window 22 and the engagement piece 24 and the adhesives, and that between the adhesives and the window 22, a number of elongate parallel grooves 38 extend along two parallel surfaces 40 of the recess portion 36 of the engagement piece 24. By way of such an arrangement, the adhesives may be received within the grooves 38.

As can be seen in Figs. 9A and 9B, the side piece 32 is composed of two interlocking side piece members 32a. Each of the side piece members 32a includes an elongate male engagement portion 40 and an elongate recess 42 for engagement with the male engagement portion 40 of another side piece member 32a. When two side piece members 32a are engaged with each other in the configuration as shown in Fig. 9B, a central cavity 44 is formed which allows two side ends 34, each of a respective window 22, to be received, one from each side. In addition, when so assembled, the side piece 32 may be slidably received within the recess 28 of the male slat member 14 or the recess 30 of the female slat member 16, as shown in Fig. 3A.

As can be seen in Figs. 10A to 10F, the roller shutter 10 may include a wicket door 46 allowing entry or exit therethrough even when the roller shutter 10 is shut. The roller shutter 10 also includes an end bar 48. Along side edges 50 of the roller shutter 10 are secured a number of side bars 52 (of which only one is shown in Figs. 10E and 10F), which prevent the relevant engagement pieces 24, and thus the windows 22, from being disengaged from the roller shutter 10 by sliding.

The male slat member 14, the female slat member 16, the engagement piece 24

and the side piece members 32a (which form the side piece 32) are all made of an aluminium alloy, with a material number of 6063-T5.

It should be understood that the above only illustrates examples whereby the present invention may be realized, and that various modifications may be made thereto. In particular, in the present examples, the window 22 is secured between a male slat member 14 and a female slat member 16. It is equally possible to secure the window 22 between two male slat members 14, or between two female slat members 16. In addition, heat insulating materials and/or sound insulating materials may be inserted into the cavity 44 of the side piece 32.

CLAIMS:-

1. A roller shutter comprising at least first, second, third and fourth engagement members, wherein said first engagement member is engaged with and swivelable relative to said third engagement member, and wherein said second engagement member is engaged with and swivelable relative to said fourth engagement member, wherein at least one non-opaque window member is secured to said first and second engagement members, wherein said window member is secured to at least said first engagement member *via* a first intermediate member, wherein said roller shutter includes means for receiving at least a side end of said window member, characterized in that said receiving means includes two interlocking receiving members.
2. A roller shutter according to Claim 1 further characterized in that said window member is secured to said second engagement member *via* a second intermediate member.
3. A roller shutter according to Claim 1 further characterized in that said first intermediate member is slidably received within a recess of said first engagement member.
4. A roller shutter according to any one of Claims 1 to 3 further characterized in that said second intermediate member is slidably received within a recess of said second engagement member.
5. A roller shutter according to any of the preceding claims further characterized in that said window member is secured to said first and/or second engagement member by an adhesive material.
6. A roller shutter according to any of the preceding claims further characterized in



that said each or the intermediate member includes a channel member for receiving at least part of said window member.

7. A roller shutter according to Claim 6 further characterized in that said channel member includes at least a side surface with at least one groove member.
8. A roller shutter according to Claim any of the preceding claims further characterized in that said receiving means is slidably received within a recess of said first engagement member.
9. A roller shutter according to Claim 8 further characterized in that said receiving means is slidably received within a recess of said second engagement member.
10. A roller shutter according to Claim 8 or 9 further characterized in that a respective side end of two window members are received by said receiving means.
11. A roller shutter according to any of the preceding claims further characterized in that side end of said window member(s) is received within a cavity formed by said interlocking receiving members.
12. A slat member for a roller shutter, wherein said slat member includes a first engagement member and a second engagement member, wherein at least one non-opaque window member is fixedly secured to said first and second engagement members, wherein said window member is secured to at least said first engagement member *via* a first intermediate member, wherein said slat member includes means for receiving at least a side end of said window member, characterized in that said receiving means includes two interlocking receiving members.
13. A slat member according to Claim 12 further characterized in that said window



- member is secured to said second engagement member *via* a second intermediate member.
14. A slat member according to Claim 12 further characterized in that said first intermediate member is slidably received within a recess of said first engagement member.
 15. A slat member according to any one of Claims 12 to 14 further characterized in that said second intermediate member is slidably received within a recess of said second engagement member.
 16. A slat member according to any one of Claims 12 to 15 further characterized in that said window member is secured to said first and/or second engagement member by an adhesive material.
 17. A slat member according to any one of Claims 12 to 16 further characterized in that said each or the intermediate member includes a channel member for receiving at least part of said window member.
 18. A slat member according to Claim 17 further characterized in that said channel member includes at least a side surface with at least one groove member.
 19. A slat member according to any one of Claims 12 to 18 further characterized in that said receiving means is slidably received within a recess of said first engagement member.
 20. A slat member according to Claim 19 further characterized in that said receiving means is slidably received within a recess of said second engagement member.
 21. A slat member according to any one of Claims 12 to 20 further characterized in that a respective side end of two window members are received by said receiving means.



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22. A slat member according to any one of Claims 12 to 21 further characterized in that side end of said window member(s) is received within a cavity formed by said interlocking receiving members.

