

Title: ROLLING DOOR ✓

5 Technical Field

The present invention is concerned with a rolling door of the type including a door curtain supported on a roller assembly for movement between open and closed positions.

Background Art

Businesses and shops are frequently secured using rolling doors of this type, which are often referred to as roller doors. Lifestyle changes in recent years mean that businesses and shops are now open for longer hours but, even when closed shop owners would like their goods to be on display. Unfortunately, conventional roller doors are made of steel or aluminium so they prevent potential customers viewing the shop owners' goods when the shop is closed.

One approach to this problem has been to use a roller door of extruded aluminium tube, arranged to form a grid, to prevent intruders gaining access to a business or a shop. However, such a door does not prevent the penetration of small animals who, once inside, may damage the contents of the business or shop. Likewise, cold wind and rain may enter through the apertures in the grid and this may also cause damage to stock. The present invention recognises that it would be desirable to have a rolling door wherein the door

curtain is formed of a transparent material and then provides an arrangement which allows such a door to be assembled.

5 Summary of the Invention

According to a first aspect of the present invention there is provided a panel suitable for use in a rolling door of the type including a door curtain supported on a
10 roller assembly for movement between open and closed position; comprising:

an elongated body member having a first longitudinal edge and a second longitudinal edge; and
15

first engagement means positioned on said first longitudinal edge and second engagement means positioned on said second longitudinal edge, each arranged so as to engage complementary engagement means on an adjacent
20 edge of another panel to link the panels and thereby form said door curtain;

characterised in that said first and second engagement means each comprises a bracket member mounted
25 on said first longitudinal edge or said second longitudinal edge, as appropriate, and extending substantially along its length; and a flange extending from said bracket member substantially transversely to said first longitudinal edge or said second longitudinal
30 edge, as appropriate, said flange comprising a link portion and an engagement portion wherein said

engagement portion has a curved cross-section with a curvature suitable to engage the engagement portion of a flange extending from a bracket member mounted on an adjacent edge of another panel.

5

Preferably, said bracket member has a base, a first arm and a second arm, each arm extending substantially transversely from said base so that said bracket member is substantially U-shaped in cross-section.

10

Typically, said first arm includes an inwardly projecting nib which is received in a complementary groove in said elongated body member.

15

Typically, said second arm includes a thickened portion at its end from which it tapers towards said base, and said elongated body member includes an indentation complementary in shape in which said second arm is received.

20

This arrangement may be such that said bracket member holds said elongated body member in position through frictional forces alone but it may be necessary to provide means for fixing said elongated body member and said bracket member together. In the former case, said elongated body member is readily removable from said bracket member which allows the body member to be replaced should it be damaged in some way.

25

Typically, if said elongated body member and said bracket member are fixed together, they are screwed together.

5 In a preferred embodiment of the invention, said link portion extends from the base of said bracket, substantially transversely thereto, and in the opposite direction to said first arm and said second arm. Said link portion may be aligned with either said first arm
10 or said second arm and generally the engagement means will be arranged with the link portion aligned with the first arm on one edge of the panel and aligned with the second arm on the other edge of the panel.

15 In a particularly preferred embodiment, said elongated body member is manufactured from a plastics material. Advantageously, said plastics material is transparent.

20 According to a second aspect of the present invention there is provided a rolling door of the type including a door curtain supported on a roller assembly for movement between open and closed positions comprising a plurality of panels as described above
25 arranged so that said first engagement means on one panel engages said second engagement means of the adjacent panel to link the panels and thereby form said door curtain.

30 It will be appreciated that the panels at either extremity of the door curtain will not require both said

first engagement means and said second engagement means, they will merely require engagement means positioned on the edge which abuts an adjacent panel.

5 According to a third aspect of the present invention there is provided a panel suitable for use in a rolling door of the type including a door curtain supported on a roller assembly for movement between open and closed positions; comprising

10

an elongated body member having a first longitudinal edge and a second longitudinal edge; and

15 first engagement means positioned on said first longitudinal edge and second engagement means positioned on said second longitudinal edge, each arranged so as to engage complementary engagement means on an adjacent edge of another panel to link said panels and thereby form said door curtain;

20

characterised in that said elongated body member is made of a transparent material.

25 Preferably, said panel is further characterised in that said first and second engagement means each comprises a bracket member mounted on said first longitudinal edge or said second longitudinal edge, as appropriate, and extending substantially along its length; and a flange extending from said bracket member
30 substantially transversely to said first longitudinal edge or said second longitudinal edge, as appropriate,

said flange comprising a link portion and an engagement portion wherein said engagement portion has a curved cross-section with a curvature suitable to engage the engagement portion of a flange extending from a bracket member mounted on an adjacent edge of another panel.

Brief Description of the Drawings

Preferred embodiments of the invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a front elevation of a prior art roller door;

15

Figure 2 is a front elevation of a roller door in accordance with the present invention;

Figure 3 is a side elevation of two panels in accordance with the present invention linked together;

20

Figure 4 is a side elevation of a disassembled panel in accordance with the present invention;

Figure 5 is a side elevation of the engagement means used in the present invention;

25

Figures 6 to 10 are a series of side elevations of several panels in accordance with the present invention linked together progressively moving from a "door closed" positioned to a "door open" position; and

30

Figure 10 is a schematic illustration of panels in accordance with the present invention supported by a roller assembly.

5

Detailed Description of the Preferred Embodiments

The prior art roller door 10 illustrated in Figure 1 consists of a plurality of horizontal bars 11 made of extruded aluminium tube which are supported by a plurality of vertical supports 12 arranged so as to allow the door to be rolled up. It will be appreciated that there are a plurality of apertures 13 within the door which are large enough for small rodents and the like to crawl through. Likewise, rain and wind can penetrate the door through apertures 13.

It will be noted that the prior art door 10 also includes aluminium bottom strip 14 which includes an opening 15 which allows an operator to grasp the door and pull it up or down. A conventional roller assembly for supporting the door will typically be used but is not shown in Figure 1.

A transparent roller door 20 in accordance with the present invention is shown in Figure 2. It will be noted that instead of aperture 13, the roller door in accordance with the present invention has a plurality of panels, such as panel 21, making up the majority of the door curtain. The panels 21 are linked by links 22.

In this case panel 21 comprises a plurality of sections 21a, 21b, etc joined end to end at, for example, join 23 to give the appearance of a continuous strip. The panel 21 is made of a transparent plastics material. In particular, the plastics material may be a polycarbonate, polyethylene, a polyacrylate or methacrylate. Typically the strips of plastic material are 2 mm to 6 mm thick.

It will also be noted that door 20 in accordance with the present invention includes a bottom bar 24, made of aluminium, which includes a handle 25 with a key lock 26. Once again, the roller door is supported on a conventional roller assembly which is not shown.

Further detail of the manner in which the panels are linked by link 22 is apparent from Figures 3 - 5. It will be seen that the panel 21 has a bracket member, in this case top bracket 27, mounted to its top edge 53 and another bracket member in this case bottom bracket 28, mounted to its bottom edge 54. Typically the brackets are extruded aluminium strips. Top bracket 27 is substantially U-shaped, having downwardly depending arms 29 and 30 and a base 31. Likewise, bottom bracket 28 has upwardly depending arms 32, 33 and a base 34. Arms 29 and 33 each have a nib 35, 36 respectively formed thereon. In each case the nib extends from the inner face of the arm into the space between the arms of the bracket members. In cross-section, the nibs 35, 36 resemble the frustrum of a pyramid. The other arm 30, 32 on brackets 27, 28 has a thickened portion 37, 38 and

a tapered portion 39, 40 tapering from said thickened portion towards the base 31, 34 respectively. The combined effect of nibs 35, 36, thickened portions 37, 38 and tapered portions 39, 40 is to create an irregular
5 surface between the arms of each bracket 27, 28. Panel 21 has a complementary surface that includes groove 41 and recess 42 at one end, and groove 43 and recess 44 at the other end. It will be appreciated that the brackets 27, 28 fit quite tightly over the ends of the panel 21,
10 but the brackets are generally fastened to the panel by screws at intervals along their length.

The complex shape of panel 21 is best achieved by injection moulding a number of pieces 21a, 21b of length
15 around 300 mm to the desired cross-section and joining these pieces to produce a strip of the length required.

Once the bracket members 27, 28 are fixed to panel 21, it will be appreciated that the panels can be
20 linked. This is achieved by connecting flange 52 on top bracket 27 to flange 49 on the bottom bracket 28 of the panel above. Each of the flanges 49, 52 has a link portion 45, 46 and an engagement portion 47, 48. It will be appreciated that the link portion serves to
25 space the curved engagement portion from the base 31, 34 of the respective brackets 27, 28. The engagement portions 47, 48 each form a loop in the space between brackets 27, 28. It can be seen in Figure 5 that the curvature of the engagement portions 47, 48 on the
30 brackets 27, 28 is suitable for the two to engage and to remain in engagement whilst in a vertical disposition.

As best seen in Figures 6 - 9, the engagement portion 48 is free to pivot within engagement portion 47 whilst remaining in engagement therewith. Indeed, it does so at each link 22 whenever the roller door 20 is wound from a closed position to an open position. The first movement in rolling the door 20 open is for bottom bracket 27 to pivot around the top bracket 28 on the second top panel. In Figure 7 the top panel is shown at an angle almost 90 degrees to the second top panel, in which position engagement portion 48 reaches the limit of its pivotal motion. Thereafter, the pivotal motion induced by the winding mechanism (not shown) is transferred to the second top strip 21 and pivotal motion occurs around the second top connection. This is shown in Figure 8. Once the second top connection reaches the end of its pivotal travel, the third top connection begins to pivot, as seen in Figure 9, and so on.

Finally, all of the panels are wound onto roller 50 as shown in Figure 10, so the door curtain 51 is raised from the closed position to the open position. It will be appreciated that the reverse motion occurs when the door moves from the open position to the closed position.



CLAIMS:

1. A panel suitable for use in a rolling door (20) of the type including a door curtain (51) supported on a roller assembly (50) for movement between open and closed position; comprising:

an elongated body member (21) having a first longitudinal edge (53) and a second longitudinal edge (54); and

first engagement means positioned on said first longitudinal edge (53) and second engagement means positioned on said second longitudinal edge (54), each arranged so as to engage complementary engagement means on an adjacent edge of another panel to link the panels and thereby form said door curtain;

characterised in that said first and second engagement means each comprises a bracket member (27, 28) mounted on said first longitudinal edge (53) or said second longitudinal edge (54), as appropriate, and extending substantially along its length; and a flange (49, 52) extending from said bracket member substantially transversely to said first longitudinal edge (53) or said second longitudinal edge (54), as appropriate, said flange (49, 52) comprising a link portion (45, 46) and an engagement portion (47, 48) wherein said engagement portion has a curved cross-section with a curvature suitable to engage the

This Sheet Has Been Replaced



THIS SHEET HAS BEEN
REPLACED



engagement portion of a flange extending from a bracket member mounted on an adjacent edge of another panel.

2. A panel as claimed in claim 1 wherein said bracket
5 member has a base (31, 34), a first arm (29, 33) and a second arm (30, 32), each arm extending substantially transversely from said base so that said bracket member (27, 28) is substantially U-shaped in cross-section.

10 3. A panel as claimed in claim 2 wherein said first arm (29, 33) includes an inwardly projecting nib (35, 36) which is received in a complementary groove (41, 43) in said elongated body member (21).

15 4. A panel as claimed in either claim 2 or claim 3 wherein said second arm (30, 32) includes a thickened portion (37, 38) at its end from which it tapers (39, 40) towards said base (31, 34), and said elongated body member (21) includes an indentation (42, 44)
20 complementary in shape in which said second arm is received.

5. A panel as claimed in any one of claims 2 to 4 wherein said link portion (45, 46) extends from the base
25 (31, 34) of said bracket (27, 28), substantially transversely thereto, and in the opposite direction to said first arm (29, 33) and said second arm (30, 32).

6. A panel as claimed in claim 5 wherein said link
30 portion (45, 46) is aligned with either said first arm (29, 33) or said second arm (30, 32).



- 13 -

7. A panel as claimed in any one of the preceding claims wherein said elongated body member (21) and said bracket member (27, 28) are fixed together.

5 8. A panel as claimed in claim 7 wherein said elongated body member (21) and said bracket member (27, 28) are screwed together.

9. A panel as claimed in any one of the preceding
10 claims wherein said elongated body member (21) is manufactured from a plastics material.

10. A panel as claimed in claim 9 wherein said plastics material is transparent.

15

11. A rolling door (20) of the type including a door curtain (51) supported on a roller assembly (50) for movement between open and closed positions comprising a plurality of panels as defined in any one of claims 1 to
20 10 arranged so that said first engagement means on one panel engages said second engagement means on the adjacent panel to link the panels and thereby form said door curtain.

25 12. A panel suitable for use in a rolling door (50) of the type including a door curtain (51) supported on a roller assembly (50) for movement between open and closed positions; comprising



an elongated body member (21) having a first longitudinal edge (53) and a second longitudinal edge (54); and

5 first engagement means positioned on said first longitudinal edge (53) and second engagement means positioned on said second longitudinal edge (54), each arranged so as to engage complementary engagement means on an adjacent edge of another panel to link said panels
10 and thereby form said door curtain;

characterised in that said elongated body member (21) is made of a transparent material.