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(54) DECORATIVE FRAME MEMBER

(71) We, YOSHIDA KOGYO K.K., a corporation duly organized under the laws of Japan and existing at No. 1, Kanda Izumicho, Chiyoda-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a decorative frame member for use in a window sash or door.

The invention seeks to provide a decorative frame member having a width which is adjustable to decorative panels of varying widths.

According to the invention, there is provided a decorative frame member comprising two elongate structural bars connected together in parallel relationship by connecting means whereby the spacing of the structural bar may be altered, each bar having an L-shaped flange with its free limb extending in a direction towards the flange on the other bar, and co-operating with the flange of the other bar to form a channel with overhung edges for receiving a decorative panel.

Preferably each structural bar has two L-shaped flanges, one on each of two opposite sides of the bar, each flange cooperating with the corresponding flange of the other bar, so that two oppositely facing channels are formed, each for receiving a decorative panel.

The invention will now be described in greater detail, by way of example, with reference to the drawings, in which:—

Figure 1 is a fragmentary perspective view of a decorative frame member constructed in accordance with a first embodiment of the invention;

Figure 2 is a perspective view of a connector block used in the decorative frame member shown in Figure 1;

Figure 3 is a fragmentary perspective view of a decorative frame member provided according to a second embodiment;

Figure 4 is a cross-sectional view of a decorative frame member according to a third embodiment;

Figure 5 is a fragmentary perspective view of a decorative frame member according to a

fourth embodiment;

Figure 6 is a cross-sectional view of a decorative frame member according to a fifth embodiment;

Figure 7 is a cross-sectional view of a decorative frame member according to a sixth embodiment; and

Figure 8 is a cross-sectional view of a modified structural bar for the decorative frame member illustrated in Figure 7.

In Figure 1, a decorative frame member 10 is used as an intermediate vertical member or stile in a window sash having a pair of sheets 11, 11 such as of glass. The decorative frame member 10 comprises a pair of first and second structural bars 12, 13 made typically of extruded aluminium, a connector 14 connecting the structural bars 12, 13 together, and a pair of elongate decorative panels 15, 16 covering the sides of the frame member 10.

The structural bars 12, 13 are identical in construction and disposed in opposite face-to-face relation. Each of the bars 12, 13 includes a pair of side walls 17, 18 spaced in parallel with each other, an intermediate wall 19 extending between and substantially perpendicularly to the side walls 17, 18, and a pair of L-shaped retainer flanges 20, 21 extending substantially perpendicularly to the side walls 17, 18. Each of the structural bars 12, 13 also includes a pair of spaced L-shaped lips 22, 23 extending from the side walls 17, 18, respectively, beyond the intermediate wall 19 away from the L-shaped flanges 20, 21. The L-shaped lips 22, 23 extend along the length of the bars 12, 13, and have distal edges 24, 25 directed toward each other. The intermediate wall 19 and the lips 22, 23 jointly provide a channel 26.

The L-shaped retainer flanges 20, 21 extend along the length of the bars 12, 13 and have their rear edges 27, 28 directed toward each other beyond the side walls 17, 18, respectively. The rear edges 27, 28, the side walls 17, 18 and the intermediate wall 19 jointly provide a channel 29 in which a marginal edge 30 of the glass sheet 11 is supported with a sealing strip or gasket 31 disposed between the rear edges 27, 28 and wrapping the marginal edge 30.

The L-shaped retainer flanges 20, 21 of the structural bar 12 have distal edges 32, 33 directed toward the bar 13, and similarly the L-shaped flanges 20, 21 of the structural bar 13 have distal edges 32, 33 directed toward the bar 12. The distal edges 32, 33 on the bar 12 and the distal edges 32, 33 on the bar 13 are held in alignment, respectively, on each side of the decorative frame member 10. The flanges 20, 21 cooperate with the side walls 17, 18 in providing a pair of channels 34, 35 one on each side of the member 10. The decorative panels 15, 16 are disposed partly in the channels 34, 35 respectively, with their edges retained by the L-shaped flanges 20, 21 of the structural bars 12, 13. Each of the decorative panels 15, 16 is made preferably of wood with its outer surface finished to give a pleasing appearance for decoration. The panels 15, 16 may be made of other materials such as a metal or plastic finished for decoration.

As shown in Figure 2, the connector 14 is a hexahedral, elongate block having a pair of top and bottom faces 36, 37 and four side faces 38, 39, 40, and 41, the side faces 38, 39 being in parallel with each other and the side faces 40, 41 being in parallel with each other. Each of the side faces 38, 39 has a first or vertical pair of parallel, spaced open ended grooves 42, 42 extending from edge to edge or from the top face 36 to the bottom face 37, and a second or horizontal pair of parallel, spaced open ended grooves 43, 43 extending from edge to edge or from the side face 40 to the side face 41 and perpendicularly to the first pair of grooves 42, 42. All of the grooves 42, 43 are spaced from their adjacent respective top and bottom faces 36, 37 and side faces 40, 41 by a distance equal to the depth of the channels 26 of the structural bars 12, 13. Since the connector 14 has the shape shown, the distance between the vertical grooves 42, 42 is smaller than that between the horizontal grooves 43, 43. Furthermore, each groove has a width which is substantially the same as the thickness of the edges 24, 25 of the L-shaped lips 22, 23.

With these grooves in both the side faces 38 and 39, the connector 14 is provided with sides 44, 45, 46 and 47 having flanges 48, 49, 50, and 51, respectively, these flanges being lower in level than the general plane of the side faces 38, 39 by a distance equal to the thickness of the L-shaped lips 22, 23.

The connector block 14 has a plurality of tapped holes 52 provided in pair in each of the top and bottom faces 36, 37 and side faces 40, 41.

For assembling the decorative frame member 10, the structural bars 12, 13 are held in spaced-apart relation and the connector 14 is installed with selected pairs of the grooves in the side faces receiving the bent edges of the L-shaped lips of the structural bars. At this time, selected sides that are oppositely disposed are received in the channels 26, 26 of the bars 12,

13. With the connector 14 positioned at a desired location, it is fixed to the bars 12, 13 by screws 53 passing through the intermediate walls 19, 19 threadedly into the tapped holes 52 in the channel-received sides of the connector 14. It is preferred to install two or more connectors at suitable intervals along the bars 12, 13 so that the bars are joined with a required degree of firmness and stability.

Then, the decorative panels 15, 16 are slid into the channels 34, 35 respectively, from one end of the bars 12, 13 until the panels cover up the entire length of the bars. Finally, the glass sheets 11, 11 are mounted in place.

When it is required to widen or narrow a distance between the opposed structural bars 12, 13; that is, to use wider or narrower decorative panels, a connector or connectors 14 are turned through 90° and installed with the other pairs of grooves 43 in the side faces receiving the edges of the L-shaped lips of the structural bars.

Accordingly, the decorative frame member 10 has two widths each selectable merely by putting in a connector or connectors 14 uprightly or pronely.

In Figure 3, a decorative frame member 55 according to a second embodiment includes a first structural bar 56 and a second structural bar 57. The first structural bar 56 comprises a front wall 58, a reinforcing partition 59 spaced from the front wall 58, and a pair of parallel, spaced side walls 60, 61 extending substantially perpendicularly to the front wall 58 and to the partition 59. The second structural bar 57 is in the form of a channel including an end wall 62 and a pair of parallel, spaced side flanges 63, 64 extending substantially perpendicularly to the end wall 62. The side flanges 63, 64 fit slidably over the side walls 60, 61, respectively.

The end wall 62 has a plurality of bores (not shown) spaced at intervals along the length thereof, and the front wall 58 has a plurality of tapped holes (not shown) spaced at intervals along the length thereof and held in registry with the bores in the end wall 62. A plurality of machine screws 65 (only one shown in Figure 3) pass through the bores in the end wall 62 threadedly into the tapped holes in the front wall 58. Thus, as the screws 65 are turned, the first and second structural bars 56, 57 are moved together or apart, thereby continuously changing the width available for the decorative frame member 55.

Each of the first and second structural bars 56, 57 has a pair of T-shaped flanges 66, 67 extending in opposite directions. The T-shaped flanges 66, 66 on one side of the frame member 10 form channels 68 receiving a decorative panel 69. Similarly, the flanges 67, 67 on the other side of the frame member 10 provide channels 70 in which a decorative panel 71 is received.

A pair of projections 72, 72 is formed on the side walls 60, 61, respectively, the projections

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72, 73 each extending outwardly and having a distal edge lying substantially flush with an outer surface of each of the side flanges 63, 64. The projections 72, 73 and the side flanges 63, 64 jointly provide support surfaces on which the decorative panels 69, 71 are placed.

Each pair of the T-shaped flanges 66, 67 forms at one edge of the decorative frame member 55 a groove 74 in which a pair of boards 75, 76 are received. The boards 75, 76 are spaced apart from each other by a spacer 77 located therebetween.

For the assembly of the decorative frame member 55, the first and second structural bars 56, 57 are held in opposed relation with the front wall 58 disposed between the flanges 63, 64. The screws 65 are inserted and turned in initially to the extent that the decorative panels 69, 71 can be slid smoothly into the channels 68, 70, respectively. Then, the decorative panels 69, 71 are inserted in place and the screws 65 are turned in until the T-shaped flanges 66, 67 tighten the decorative panels 69, 71 securely in place.

Figure 4 shows a decorative frame member 78 according to a third embodiment in which a first structural bar 79 has a substantially channel-shaped cross-section and a second structural bar 80 has a substantially H-shaped cross-section. The first structural bar 79 includes a pair of side walls 81, 82 having a pair of shoulders 83, 84, respectively, located substantially centrally thereof. The shoulders 83, 84 divide the side walls 81, 82 into a pair of wall sections 85, 86 and a pair of inwardly offset wall sections 87, 88. The offset wall sections 87, 88 are connected together by a bottom wall 89 extending generally normal thereto. The bottom wall 89 has a plurality of bores (not shown) spaced at suitable intervals along the length thereof.

The second structural bar 80 comprises a bottom plate 90, a pair of flanges 91, 92 extending perpendicularly from the bottom plate 90, and a reinforcing partition 93 extending between the flanges 91, 92 and positioned adjacent to the distal edges of the flanges 91, 92. The partition 93 has a plurality of tapped holes (not shown) located at spaced intervals along the length thereof and in registry with the bores in the bottom wall 89. The partition 93 and the marginal edges of the flanges 91, 92 jointly provide a channel 94 in which the offset wall sections 87, 88 are slidably fitted. A support channel 95 is fitted in the first structural bar 79 with its bottom 96 held against the shoulders 83, 84. The channel 95 receives therein a marginal edge 97 of a board 98.

The first and second structural bars 79, 80 are joined together by a plurality of machine screws 99 passing through the bores in the bottom wall 89 threadedly into the tapped holes in the partition 93. As the screws 99 are turned in, the first and second structural bars 79, 80 are moved closer until inserted decorative

panels 100, 101 are held tightly in place. The flanges 91, 92 and the wall sections 85, 86 lie flush with each other, so that the decorative panels 100, 101 thereon are supported with stability.

With the second and third embodiments, the first and second structural bars when assembled are held in partly overlapped relation with the result that the decorative frame members 55, 78 retain sufficient mechanical strength.

According to a fourth embodiment shown in Figure 5, a pair of first and second structural bars 103, 104 are each in the form of a channel having a bottom wall 105. The bottom walls 105, 105 of the first and second structural bars 103, 104 face each other, and are connected together by a plurality of machine screws 106 (only one seen) passing through the bottom wall 105 of the second bar 104 threadedly into the bottom wall 105 of the first bar 103. The embodiment of Figure 5 is relatively simple in structure and its adjustability of width is largely governed by the length of the screws 106 used.

As shown in Figure 6, a pair of channel-shaped structural bars 107, 108 are coupled together by a wooden block 109 interposed between the bars 107, 108, and pairs of wood screws 110 passing through bottom walls 111, 112 threadedly into the wooden block 109. The wooden block 109 has a thickness substantially equal to a width of each channel of the bars 107, 108, such that decorative panels 113, 114 are backed up neatly. The decorative frame member according to the fifth embodiment can be changed in width by using wooden blocks of different widths and by turning in the wood screws 110 to varying degrees.

A decorative frame member 115 illustrated in Figure 7 acts as a bottom rail as in a door. The bottom rail 115 includes a top structural bar 116 and a bottom structural bar 117. The top structural bar 116 is cross-sectionally H-shaped and includes a pair of legs 118, 119 having a pair of integral L-shaped flanges 120, 121, respectively, projecting perpendicularly from their edges. The bottom structural bar 117 comprises a hollow, cross-sectionally rectangular body 122 having a pair of spaced flanges 123, 124 directed toward the top structural bar 116. The flanges 123, 124 are held in alignment with the legs 118, 119, respectively. The bottom structural bar 117 also includes a pair of projections 125, 126 spaced laterally apart from the flanges 123, 124, respectively. The projections 125, 126 are held in alignment with bent edges 127, 128, respectively, of the L-shaped flanges 120, 121.

A wooden block 129 is interposed between the top and bottom structural bars 116, 117 and fastened thereto by pairs of wood screws 130. A door board 131 has its lower marginal edge 132 inserted between the legs 118, 119. According to this embodiment, the bottom structural bar 117 supports a plurality of rollers (not shown) which rotatably ride on a rail.

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Figure 8 depicts a modified top structural bar 133 that can replace the top structural bar 116 shown in Figure 7. The structural bar 133 has a substantially H-shaped cross-section including a pair of legs 134, 135 having a pair of integral L-shaped flanges 136, 137 projecting from their sides.

WHAT WE CLAIM IS:-

1. A decorative frame member comprising two elongate structural bars connected together in parallel relationship by a connecting means whereby the spacing of the structural bars may be altered, each bar having an L shaped flange, with its free limb extending in a direction towards the flange on the other bar, and co-operating with the flange of the other bar to form a channel with overhung edges for receiving a decorative panel.
2. A decorative frame member according to claim 1, wherein each structural bar has two L shaped flanges, one on each of two opposite sides of the bar, each flange co-operating with the corresponding flange of the other bar so that two oppositely facing channels are formed, each for receiving a decorative panel.
3. A decorative frame member according to claim 1 or 2 wherein each of the structural bars has a pair of spaced L-shaped lips and the connector comprises a hexahedral, elongate block having a pair of parallel side faces, each face having a first pair of parallel spaced grooves extending from edge to edge and a second pair of parallel spaced grooves, with a spacing different from that of the first pair of grooves, the second pair of grooves extending from edge to edge and perpendicularly to said first pair of grooves, each groove in one of the first and second pairs in each side face receiving one of the spaced lips of each of the structural bars, and there being screws passing through the structural bars threadedly into the connector.
4. A decorative frame member according to

claim 1 or 2, wherein the connector comprises a machine-screw passing through a wall of one structural bar and in threaded connection with a wall of the other structural bar.

5. A decorative frame member according to claim 1 or 2, wherein one structural bar includes a pair of parallel spaced side walls extending substantially towards the other structural bar and the said other structural bar includes a pair of parallel, spaced side flanges extending substantially towards the said one structural bar and fitted slidably over the spaced side walls of the said one structural bar.

6. A decorative frame member according to claim 5, wherein at least one of the spaced side walls has a projection having a distal edge lying substantially flush with an outer surface of at least one of the side flanges.

7. A decorative frame member according to claim 1 or 2, wherein the connector comprising a replaceable wooden block interposed between the two and second structural bars, and a pair of wood screws passing through the two structural bars, threadedly into the wooden block.

8. A decorative frame member according to claim 1 or 2 wherein each of the structural bar has a pair of parallel, spaced side walls extending in line with the L-shaped flanges to thereby provide a H-shaped cross-section, and each free limb of the first and second L-shaped flanges extending substantially perpendicularly from one of the said spaced side walls of the structural bars.

9. A decorative frame member substantially as herein described with reference to the drawings.

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Figure 8 depicts a modified top structural bar 133 that can replace the top structural bar 116 shown in Figure 7. The structural bar 133 has a substantially H-shaped cross-section including a pair of legs 134, 135 having a pair of integral L-shaped flanges 136, 137 projecting from their sides.

WHAT WE CLAIM IS:-

1. A decorative frame member comprising two elongate structural bars connected together in parallel relationship by a connecting means whereby the spacing of the structural bars may be altered, each bar having an L shaped flange, with its free limb extending in a direction towards the flange on the other bar, and co-operating with the flange of the other bar to form a channel with overhung edges for receiving a decorative panel.

2. A decorative frame member according to claim 1, wherein each structural bar has two L shaped flanges, one on each of two opposite sides of the bar, each flange co-operating with the corresponding flange of the other bar so that two oppositely facing channels are formed, each for receiving a decorative panel.

3. A decorative frame member according to claim 1 or 2 wherein each of the structural bars has a pair of spaced L-shaped lips and the connector comprises a hexahedral, elongate block having a pair of parallel side faces, each face having a first pair of parallel spaced grooves extending from edge to edge and a second pair of parallel spaced grooves, with a spacing different from that of the first pair of grooves, the second pair of grooves extending from edge to edge and perpendicularly to said first pair of grooves, each groove in one of the first and second pairs in each side face receiving one of the spaced lips of each of the structural bars, and there being screws passing through the structural bars threadedly into the connector.

4. A decorative frame member according to

claim 1 or 2, wherein the connector comprises a machine screw passing through a wall of one structural bar and in threaded connection with a wall of the other structural bar.

5. A decorative frame member according to claim 1 or 2, wherein one structural bar includes a pair of parallel spaced side walls extending substantially towards the other structural bar and the said other structural bar includes a pair of parallel, spaced side flanges extending substantially towards the said one structural bar and fitted slidably over the spaced side walls of the said one structural bar.

6. A decorative frame member according to claim 5, wherein at least one of the spaced side walls has a projection having a distal edge lying substantially flush with an outer surface of at least one of the side flanges.

7. A decorative frame member according to claim 1 or 2, wherein the connector comprising a replaceable wooden block interposed between the two and second structural bars, and a pair of wood screws passing through the two structural bars, threadedly into the wooden block.

8. A decorative frame member according to claim 1 or 2 wherein each of the structural bar has a pair of parallel, spaced side walls extending in line with the L-shaped flanges to thereby provide a H-shaped cross-section, and each free limb of the first and second L-shaped flanges extending substantially perpendicularly from one of the said spaced side walls of the structural bars.

9. A decorative frame member substantially as herein described with reference to the drawings.

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