SEALING JOINT FOR ARCHITECTURAL PORCELAIN ENAMELED PANELS

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This invention relates to porcelain enameled panels and to an improved method and means for effecting a seal between the joints of such panels for architectural and similar purposes. More specifically, the invention relates to a sealing joint for paneled external walls to render them weather-tight.

Architectural porcelain enamel has a wide range of application and the installation of porcelain enameled panels on commercial buildings such as service stations and store fronts, where appearance is important, are two common examples. Ordinarily, architectural porcelain enamel is custom made to fit a specific building and may be applied either as a curtain wall on a prefabricated steel skeleton frame or as a facing applied to a masonry wall. In either case, it is necessary to have a weather-tight seal between the individual panels of porcelain which make up the finished wall surface. The porcelain panels themselves are impervious to the elements and will last indefinitely.

Heretofore, the joints between the panels have been sealed with caulking compound or mastic, but the expected life of a caulked joint is relatively short and frequent recaulking during the life of the building is required. Further, the recaulking cost is secondary because as the building ages and the caulking deteriorates the appearance and weatherproofness suffers progressively, the latter resulting in internal damage due to the elements.

It is, therefore, a primary object of the invention to provide a new method and means for simplifying and expediting the application of sealing joints for use with porcelain enameled panels. Another object is to provide for such improvements as will enhance the appearance of the finished paneled wall. A further object of the invention is to provide means which will permit the application of the joint in the field by a semi-skilled workman in a neat and efficient manner. Still another object of the invention is to provide a sealing joint which is long-lasting, inexpensive and readily adapted for use on custom-made panels.

It is a further object of the invention to provide an improved form and construction of a sealing joint which permits a completely weather-tight joint between the panels. An additional object is to provide a sealing joint which will conform to various spacings of the edges of the adjacent panels both initially and as the structure ages thereby assuring a weather-tight seal throughout the life of the panel wall. These and other objects and advantages of the invention will become apparent as my description thereof proceeds.

Briefly, according to my invention, the porcelain panel is mounted in any conventional manner and a seal comprising a zipper plastic joint is applied between each panel. Extrusions are fastened to the panel flanges hermetically at the factory where the panels are produced. When the porcelain panel is installed on the structure, the sealing edge of one extrusion overlaps the sealing edge of the extrusion carried by the next adjacent panel.

Each extrusion comprises a "track" of a zippered type closure and a metal slide causes the extrusions to mate. By applying heat to the metal slide fastener, the joint can be hermetically sealed making a very effective weather-tight joint.

At the crossovers or intersections of the joints I may use a deformable "frog block." The frog block is provided with the tracks adapted to be mated with the corresponding tracks on the extrusions or ribbons attached to the edges or flanges of the porcelain panels.

Further details and advantages of the invention will be described in connection with the accompanying drawings wherein:

Figures 1 and 2 are elevational views of groups of mounted panels provided with a sealing joint constructed in accordance with this invention;

Figures 3, 4 and 5 are cross-sectional views showing seal constructions applied to adjacent mounted panels;

Figure 6 is an enlarged section showing the details of the mating extrusions of Figure 3;

Figure 7 is a plan view of a slide fastener closing a seal such as illustrated in Figures 3, 4 and 5; and

Figure 8 is a perspective of the frog blocks used at the corners.

Referring to the drawings, a plurality of panels 10 are mounted on the face of a structure 11 by means of metal tabs 12 which are fixed to an edge or flange 13 of the panels 10. A typical porcelain enameled panel 10 is about 3 feet by 4 feet with the edge or flange 13 having a depth of about 1 inch to about 2 inches and the flanges 13 are spaced from each other about 0.1875 to about 0.375 inch. On each of the edges 13 I provide one-half of the sealing joint which comprises an extrusion or strip 14 and a mate strip 15. Each of the strips 14 and 15 can be conveniently fabricated by extrusion through a suitable die and cut to approximate lengths for attachment to the flanges 13. The flanges 13 are provided with apertures 16 so that the strips 14 and 15 can be turned back on themselves and hermetically sealed to each other through the apertures 16 as illustrated in Figures 3, 4 and 5. A plurality of apertures 16 are provided along the length of each depending flange 13 so as to adequately secure the strips 14 or 15 to the flanges 13.

It is also contemplated that the flexible strips 14 and 15 may be affixed to the flanges 13 by applying the trough-like portion of the strip to the flange and securing it by means of clips (not shown) adapted to compress the strip about the flange 13.

In Figure 8, I have illustrated a deformable "frog block" 17 which is pressed between the panels 10 at the corner joints. The corresponding track 18 on each of the strips 14 and 15 is molded into the frog block 17, the illustrated frog block 17 being intended for use with the sealing joint illustrated in Figure 5.

To effect a seal of the strips 14 and 15 (Figure 5), the slide fastener 19 may be heated so as to hermetically seal the joint. It is also contemplated that the slide fastener 19 used in closing the joint illustrated in Figures 4 and 7 may be provided with a heating means so that this locking joint can be permanently closed by fusion and flow of the plastic.

Suitable materials for manufacturing the strips 14 and 15 include the thermoplastic and thermosetting organic resins. Of particular importance for this use are the vinyl type resins and the polymerized olefinic resins such as polyethylene. The strips 14 and 15 include a substantially flat web portion 20 and an offset longitudinal marginal portion or track 18 which is substantially thicker than the thickness of the web 20. Formed in the track portion 18 are a series of alternate pairs of channels 21 in solid ribbon-like projections 22. The projections 22 and channels 21 are of identical shape and cross-section.
as shown in Figure 6 for example so that the projections 22 of one strip are received in and nested with the channels of the other and vice versa when the strips are overlapped and a slide pulled therealong to close the seal.

The configuration of the projections 22 and channels 21 may be selected to suit various circumstances and three forms have been illustrated in the drawings.

One form of closure is shown in Figure 3 which includes a pair of interengaging tracks having valleys and projections as shown in Figure 6. In Figure 4, the closure includes a bead 24 and a marginal gripping edge 25 which is substantially annular in cross-section. The embodiment of Figure 5 can be used to effect a heat sealing of the strips 14 and 15 without any interengagement of the overlapping portions 26 and 27 as in the embodiments of Figures 3 and 4.

The frog block 17 is provided with chambers 23 to render the unit resilient and deformable so as to provide an adaptable corner block which can be used with various spacings of the panels 10. The frog block 17 also includes webs 20 provided with tracks 18 corresponding to those of strips 14 and 15 with which the frog block 17 is to be timed. Ordinarily the overall dimensions of the block 17 are not more than about 6 inches in each direction and the resilient chambers are about 1 inch by about 0.25 inch in cross-section.

To install and seal a panel assembly, the panels 10 with the strips 14 and 15 attached thereto are mounted on the structure 11, the mating edges of the strips 14 and 15 are overlapped by means of the fasterer slide 19 which is drawn along the joint between the two panels. This closes the joint. It is preferred that the strip 14, attached to the upper panel 10, should overlap the lower strip 15 in shingle-fashion.

From the above, it will be apparent that I have attainted the objects of my invention by providing a closure or joint for use between mounted porcelain panels making unnecessary the use of a caulking compound and providing a weather-tight joint which is conformable to the non-uniform placement of the panels 10 upon the structure.

Although I have described the invention in terms of specific examples and operations which have been set forth in some detail, it is to be understood that these are by way of illustration only and that my invention is not limited thereto. Alternative embodiments of apparatus and variations in operating techniques will become apparent to those skilled in the art in view of my disclosure. Accordingly, modifications in the invention and the mode of using the apparatus are contemplated without departing from the spirit thereof.

What I claim is:
1. A metal panel structure including at least two spaced panels of the type including a substantially flat body portion and inwardly extending planar flanges, the improvement which comprises flanges disposed normal to the plane of the body portion of such panels, flexible interlocking sealing components fixed to each flange, each of such sealing components including an elongated trough-shaped web portion fixed about both sides of such flange, overlapping marginal sealing portion extending outwardly of each of said flanges, and a plurality of apertures in said flanges into which projections on said web portion extend, said marginal sealing portions being of substantially identical cross-section but reversed when in overlapping relation, each marginal portion having parallel mating surfaces adapted to be joined to form a seal between the overlapping marginal portions by progressively applying pressure therealong from opposite sides of said overlapping marginal portions, said marginal portions being sealable by a traveling slide member passed therealong.

2. In a covering for a wall, at least two upstanding panels arranged edge to edge in vertically spaced relation, a flange joined to each panel and extending inwardly therefrom along adjacent facing edges, a plurality of apertures in said flanges, means carried by each flange for anchoring respective panels to a wall, and separately formed sealing components fixed to said flanges and positioned between said panels, each of said sealing components including an elongated trough-shaped web portion fixed over both sides of the associated flange, and overlapping ribbed marginal portions integral with said web portions, said marginal portions being of substantially identical cross-section but reversed when in overlapping relation, said marginal portions having parallel channels and projections alternating with each other, said projections having opposite abutting re-entrant surfaces, the overlapping marginal portions forming a seal.

3. The apparatus of claim 1 wherein the overlapping marginal portions comprise at least one channel on one of said portions and at least one projection on the other of said portions, said channel and projections being adapted to be joined to form the seal.

4. The structure of claim 1 wherein the marginal portions of the upper of the two sealing components overlap the lower of said marginal portions in the manner of a shingle in providing the seal between the adjacent panel edges.

5. In a paneled wall structure, a plurality of facing panels in close array, each panel having a flat body portion and inwardly extending flanges, an extruded flexible sealing strip extending along and fastened to at least some of said flanges and having a marginal portion of the said sealing strip extending outwardly of the flange, the marginal portion of said sealing strip having a projection thereon, and a corresponding extruded flexible sealing strip extending along and fastened to the flange of a panel adjacent the first mentioned sealing strip, this latter sealing strip having a marginal portion extending outwardly of the flange and having a projection-receiving channel therein, said channel being adapted to engage and disengage by means of a traveling slide member in overlapped joined relation with the corresponding projection of the first mentioned sealing strip and thereby form a weather-tight joint.

6. A metal panel structure of the type including a substantially flat rectangular body portion and inwardly extending flanges, two flanges having an extruded flexible sealing strip extending along and fastened to said flanges, said sealing strip having a marginal portion thereof extending outwardly of the flange, the marginal portion having a projection thereon, and the other two of said flanges having an extruded flexible sealing strip extending along and fastened thereto, this latter strip having a marginal portion extending outwardly of the flange and having a projection-receiving channel therein said channel being adapted to engage and disengage by means of a traveling slide member in overlapped joined relation with an adjacent sealing strip having a projection on the marginal portion thereof to form a weather-tight joint.

References Cited in the file of this patent

UNITED STATES PATENTS
2,353,853 Tedesco ---------------- July 18, 1944
2,270,153 Fischer ---------------- Feb. 27, 1945
2,613,421 Madsen -------------- Oct. 14, 1952
2,708,016 Panton -------------- May 10, 1955
2,777,181 Morner ------------- Jan. 15, 1957

FOREIGN PATENTS
132,827 Canada ------------------ May 30, 1949
490,742 France ------------------ Jan. 8, 1920
1,058,865 France ---------------- Nov. 10, 1953
1,066,917 France ---------------- Jan. 27, 1954