United States Patent [19]

Adler et al.

[11] **3,802,143**

[45] **Apr. 9, 1974**

[54] **WINDOW ASSEMBLY ESPECIALLY FOR AN AUTOMOBILE**

[75] Inventors: **Jurgen Adler; Karl Erck; Kurt Schwenk,** all of Wolfsburg, Germany

[73] Assignee: **Volkswagenwerk Akt,** Wolfsburg, Germany

[22] Filed: **June 29, 1971**

[21] Appl. No.: **157,872**

[30] **Foreign Application Priority Data**

July 3, 1970 Germany 2032990

[52] **U.S. Cl.** **52/400**

[51] **Int. Cl.** **E06b 3/56,** E06b 3/58

[58] **Field of Search** 52/400, 397, 402, 403, 52/616

[56] **References Cited**

UNITED STATES PATENTS

3,276,178	10/1966	Letourneur	52/403
3,214,212	10/1965	Horton	52/400
2,479,436	8/1949	Vigmostad	52/400
2,456,175	12/1948	Coppock	52/400
2,610,714	9/1952	Bradley	52/400
2,637,422	5/1953	Bell	52/397
2,761,729	9/1956	Renre	52/400
3,093,844	6/1963	Brock	52/400
3,148,753	9/1964	Hodgen	52/400

FOREIGN PATENTS OR APPLICATIONS

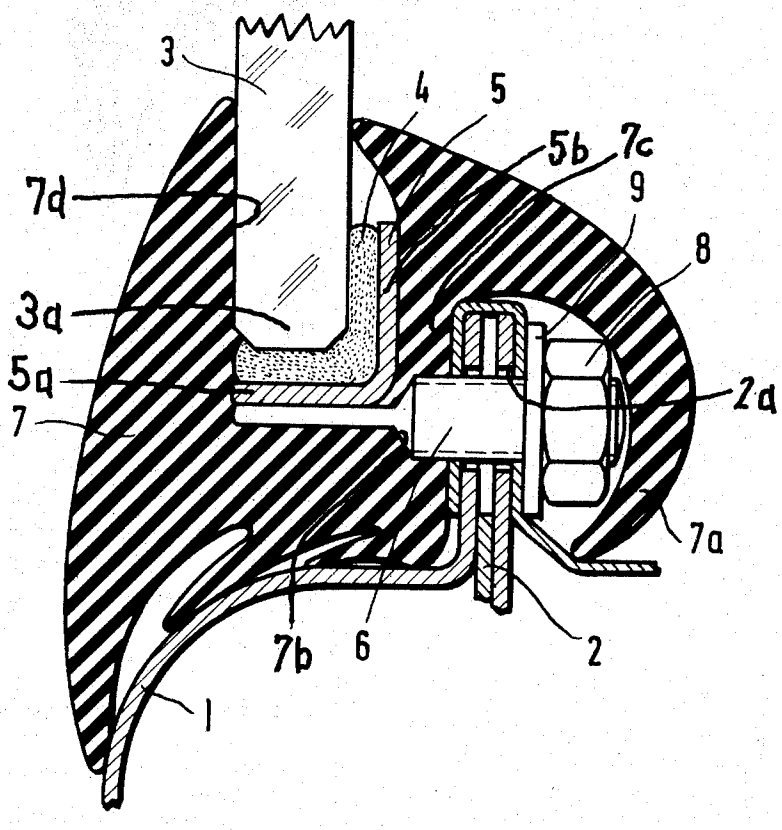
360,486	4/1962	Switzerland	52/616

Primary Examiner—Henry C. Sutherland
Assistant Examiner—H. E. Raduazo
Attorney, Agent, or Firm—Brumbaugh, Graves, Donohue & Raymond

[57] **ABSTRACT**

A window assembly especially for an automobile includes a primary frame defining a window opening. An auxiliary frame is provided to facilitate mounting of a windowpane in the opening defined in the primary frame. The windowpane is mounted on the auxiliary frame by means of an adhesive at a location remote from the final assembly point. An elastic sealing strip is mounted on the auxiliary frame in surrounding relationship to the latter and to the edge of a windowpane mounted thereon. The auxiliary frame is attached to the primary frame by means of a plurality of elongated connecting elements which extend through the elastic sealing strip.

14 Claims, 3 Drawing Figures



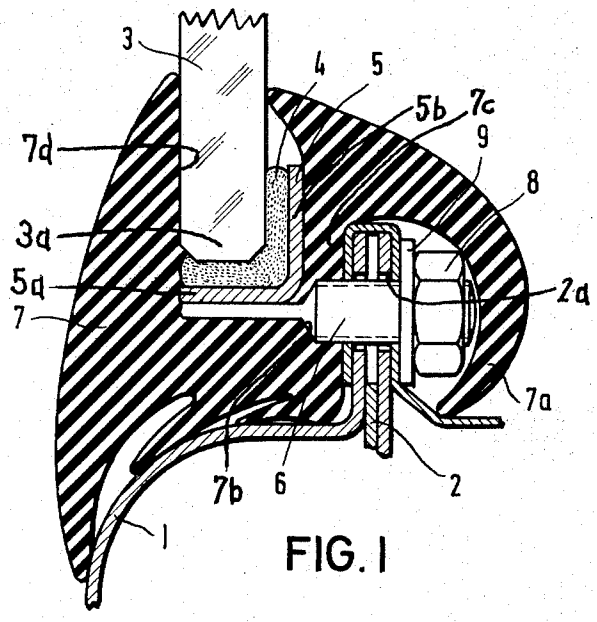


FIG. 1

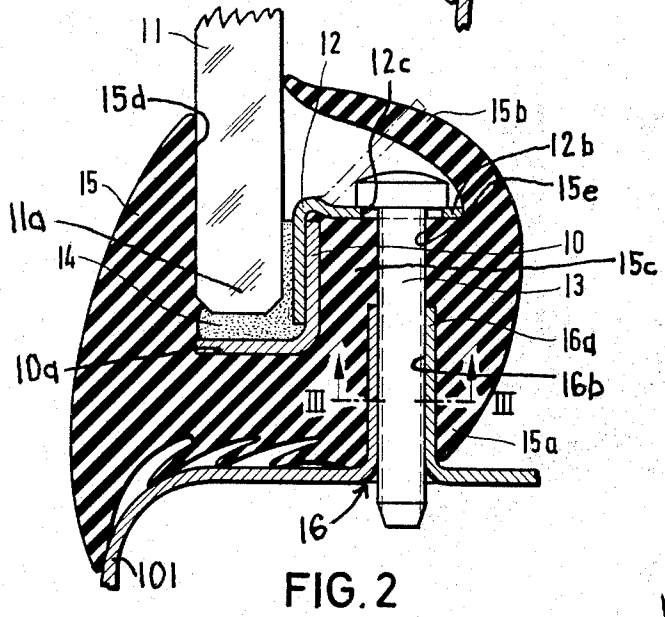
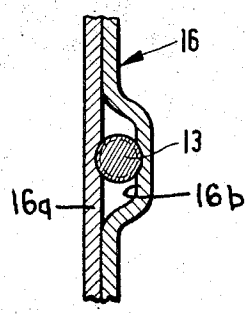


FIG. 2

FIG. 3



INVENTOR
JURGEN ADLER
KARL ERCK
KURT SCHWENK

BY

WATSON COLE GRINDLE & WATSON
ATTORNEYS

WINDOW ASSEMBLY ESPECIALLY FOR AN AUTOMOBILE

CROSS REFERENCE TO RELATED APPLICATION

Applicants claim priority from German application P 20 32 990.2, filed July 3, 1970.

BACKGROUND OF INVENTION

The present invention relates to a window assembly especially for an automobile and in particular to such assembly wherein a windowpane is first attached onto an auxiliary frame by means of an adhesive and the latter, together with the pane, is then attached to the primary frame surrounding the window opening. Such a procedure and assembly is disclosed and claimed in commonly owned U. S. Pat. application, Ser. No. 145,764, filed May 21, 1971 in the names of the present inventors and others.

SUMMARY OF THE INVENTION

The present improvement to said assembly comprises the attachment of the auxiliary frame to a bridge extending parallel to the pane by means of elongated connecting elements extending through an elastic sealing strip which surrounds the auxiliary frame and the edge of the pane and has a portion disposed between the latter and the bridge.

In its broad aspects the present invention comprises a window assembly especially for an automobile which includes a primary frame surrounding a window opening, the primary frame being generally L-shaped in transverse cross-sectional configuration to present a bridge disposed generally in the plane of the opening and extending therearound. Also included is an auxiliary frame adapted for attachment to the primary frame, the auxiliary frame presenting an opening generally coextensive in size with the window opening. A windowpane is mounted on the auxiliary frame in covering relationship to the opening therein and adhesive means are provided for attaching the window frame and the auxiliary frame together. A plurality of elongated connecting elements is provided for partly interconnecting the auxiliary frame and the bridge. An elastic sealing strip extends around the windowpane and is disposed in partly surrounding relationship to the auxiliary frame and to the edge of the windowpane. The elastic sealing strip has a central portion disposed generally between the auxiliary frame and the bridge. There are a plurality of openings extending through the central portion of the elastic sealing strip, the connecting elements being received therethrough.

By virtue of the present invention, an assembly is provided which facilitates efficient pre-assembly of the auxiliary frame and the windowpane. The elastic sealing strip may be mounted on the auxiliary frame in surrounding relationship thereto prior to the mounting of the auxiliary frame onto the primary frame. The connecting elements extend through the elastic sealing strip which has a portion disposed between the frames providing a resilient shock-absorbing mounting for the windowpane.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational cross-sectional view illustrating the internal details of a window assembly which embodies the concepts and principles of the invention;

FIG. 2 is an elevational cross-sectional view illustrating the internal details of another form of window assembly;

FIG. 3 is a cross-sectional view taken substantially along line III—III of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT:

One form of an automotive window assembly which embodies the principles and concepts of the present invention is illustrated in FIG. 1. The assembly includes a primary frame 1 which surrounds the window opening. Frame 1 is generally L-shaped in transverse cross-sectional configuration and presents a spot welded flange in the nature of a bridge 2 extending around the opening. A windowpane 3 is held within an auxiliary frame 5 by means of an adhesive 4. Frame 5 extends around an opening which is generally co-extensive in size with the window opening of frame 1. Frame 5 is also generally L-shaped in transverse cross-sectional configuration, as illustrated, presenting a leg 5*a* which extends perpendicularly of pane 3 in supporting relationship to the lower edge 3*a* thereof and a leg 5*b* which is generally perpendicular to leg 5*a* and is disposed between windowpane 3 and bridge 2.

A plurality of elongated connecting bolts 6 (only one is illustrated) are welded to leg 5*a* of auxiliary frame 5. Bolts 6 are spaced around the periphery of frame 5 and each extends therefrom through a corresponding hole 2*a* in bridge 2.

An elastic sealing strip 7 extends around the window opening and has a groove 7*d* therein which surrounds auxiliary frame 5 and the edge 3*a* of windowpane 3. Strip 7 also has a central portion 7*c* which is disposed between bridge 2 and auxiliary frame 5. A plurality of openings 7*b* are provided in central portion 7*c*, one for each bolt 6, the latter being received through openings 7*b* as illustrated. A nut 8 and flat washer 9 are provided for securing each bolt 6 to bridge 2. Manifestly, as nuts 8 are tightened on bolts 6, central portion 7*c* of strip 7 will be compressed between bridge 2 and auxiliary frame 5, providing a resilient mounting for the latter. Preferably, strip 7 is provided with a flashing member 7*a* disposed to surround nuts 8 whereby the latter are concealed from view.

The window assembly is constructed by first attaching windowpane 3 to auxiliary frame 5 by means of adhesive 4. Bolts 6 have preferably been previously welded to auxiliary frame 5. Auxiliary frame 5, with windowpane 3 attached thereon, is then inserted into groove 7*d* of sealing strip 7, with bolts 6 extending through corresponding openings 7*b*.

Windowpane 3, auxiliary frame 5, and sealing strip 7 are then mounted onto bridge 2. Bolts 6 are placed in the corresponding holes in bridge 2 and nuts 8 and washers 9 are placed on the bolts and tightened. After nuts 8 have been appropriately tightened, flashing member 7*c* is allowed to assume its normal position in covering relationship to nuts 8.

FIG. 2 illustrates another form of window assembly embodying the invention. In FIG. 2, the assembly includes a primary frame 101 which surrounds the win-

dow opening. Frame **101** is generally L-shaped in transverse cross-sectional configuration and presents a spot welded flange in the nature of a bridge **16** extending around the opening. A windowpane **11** is held against an auxiliary frame **10** by means of an adhesive **14.** Frame **10** extends around an opening which is generally co-extensive in size with the window opening of frame **101.** Frame **10** is also generally L-shaped in transverse cross-sectional configuration, as illustrated, presenting a leg **10***a* which extends perpendicularly of pane **11** in supporting relationship to the lower edge **11***a* thereof and a leg **10***b* which is generally perpendicular to leg **10***a* and is normally disposed between pane **11** and bridge **16.**

A plurality of generally L-shaped holding tabs **12** (only one is illustrated) are spaced around the periphery of frame **10.** Each tab **12** has a portion **12***a* welded to leg **10***b* of frame **10** and a length **12***b* disposed to extend perpendicularly away from pane **11** and into overlying relationship to bridge **16.**

Each length **12***b* has a hole **12***c* therethrough. A corresponding widened area **16***a* (FIG. **3**) is provided in bridge **16** for each hole **12***c*. A hole **16***b*, which extends generally parallel to pane **11,** is provided in each area **16***a*. Holes **16***b* are aligned with holes **12***c* and screws **13** are received through the holes, as shown in FIG. **2,** for the purpose of rigidly securing frames **10** and **101** together.

An elastic sealing strip **15** extends around the window opening and has a groove **15***d* therein which surrounds auxiliary frame **10** and the edge **11***a* of the windowpane **11.** Strip **15** also has a central portion **15***c* which is disposed generally between bridge **16** and the auxiliary frame **10.** A plurality of openings **15***c* are provided in central portion **15***c*, one for each screw **13,** the latter being received through openings **15***e* as illustrated. Manifestly, as screws **13** are tightened, the central portion **15***c* of strip **15** will be compressed between bridge **16** and tabs **12** providing a resilient mounting for frame **10.** Preferably, strip **15** is provided with a flashing member **15***b* disposed to surround screws **13** whereby the latter are concealed from view.

The window assembly of FIG. **2** is constructed by first attaching windowpane **11** to auxiliary frame **10** by means of adhesive **14.** Tabs **12** have preferably been previously welded to auxiliary frame **10.** In this connection, lengths **12***b* of tabs **12** are preferably initially disposed at an angle (shown in phantom lines in FIG. **2**) relative to their final positions to facilitate assembly. Auxiliary frame **10,** with windowpane **11** attached thereon, is then inserted into groove **15***d* of sealing strip **15,** with screws **13** extending toward openings **15***e*.

Windowpane **11,** auxiliary frame **10,** and sealing strip **15** are then mounted onto bridge **16.** A flap **15***a* of strip **15** is pulled in known manner over bridge **16** with the help of a string. Flashing **15***b* is pulled back and lengths **12***b* are bent into their normal positions with screws **13** extending through holes **15***e* and into holes **16***b*. After screws **13** have been appropriately tightened, flashing **15***b* is allowed to assume its normal position in covering relationship to screws **13.**

We claim:

1. A window assembly for an automobile comprising:

a primary frame surrounding a window opening, said frame being generally L-shaped in transverse cross-sectional configuration presenting a bridge disposed generally in the plane of said opening and extending therearound;

an auxiliary frame defining a substantially closed figure adapted for attachment to the primary frame, said auxiliary frame presenting an opening generally coextensive in size with said window opening;

a windowpane mounted on, and adhesively bonded directly to the auxiliary frame around substantially the entire periphery of said windowpane in covering relationship to the opening in said auxiliary frame;

a plurality of elongated connecting elements firmly interconnecting the auxiliary frame and said bridge;

an elastic sealing strip extending around the window opening, said strip being disposed in partly surrounding relationship to, but unadhered to, the auxiliary frame and to the edge of the windowpane and having a central portion disposed generally between the auxiliary frame and said bridge;

there being a plurality of openings extending through said central portion of the strip receiving said connecting elements therethrough.

2. A window assembly as set forth in claim **1** wherein said auxiliary frame is generally L-shaped in transverse cross-sectional configuration presenting a pair of generally perpendicular legs, said auxiliary frame being disposed with one leg extending generally perpendicularly of the major plane of the windowpane adjacent the edge thereof and with the other leg disposed between the windowpane and the bridge.

3. A window assembly as set forth in claim **2** wherein said connecting elements are rigidly connected to said one leg of the auxiliary frame and extend through the bridge in a direction generally perpendicularly of the major plane of the windowpane, said elements including means for securing the same to said bridge.

4. A window assembly as set forth in claim **3** wherein said elements comprise threaded bolt and nut assemblies.

5. A window assembly as set forth in claim **2** wherein a plurality of holding tabs are provided on said other leg of the auxiliary frame, said tabs having a length disposed to extend away from the windowpane in a direction generally perpendicular thereto, there being a hole through each tab and corresponding holes extending through the bridge in a direction generally parallel to the plane of the windowpane, said connecting elements comprising screws extending through the corresponding holes in the tabs and into the holes in the bridge.

6. A window assembly as set forth in claim **5** wherein each of said tabs is transversely L-shaped presenting said length and another portion which extends generally perpendicularly of the length, said portions being attached to said other leg of the auxiliary frame.

7. A window assembly as set forth in claim **5** wherein said bridge has a plurality of widened areas, the holes in the bridge being disposed to extend through said widened areas.

8. A window assembly as set forth in claim **1** wherein said sealing strip includes a flashing member completely covering the outer portions of the connecting elements.

9. A window assembly as set forth in claim **3** wherein said sealing strip includes a flashing member com-

pletely covering the outer portions of the connecting elements.

10. A window assembly as set forth in claim **5** wherein said sealing strip includes a flashing member completely covering the outer portions of the connecting elements.

11. An apparatus for fastening a windowpane in a frame comprising:

a primary frame having a flange thereon, said flange having an inner edge defining a window opening;

a substantially continuous auxiliary frame defining a substantially closed figure adapted for substantially surrounding the windowpane, and having a right angle cross-section, one leg of which runs parallel to and surrounds the peripheral edge of the windowpane and the other leg of which is interposed between the windowpane and said flange of said primary frame, said one leg terminating in a free edge defining an unrestricted opening similar in shape to, but larger than, said windowpane, to enable said auxiliary frame to be placed on the peripheral area of said windowpane with said one leg surrounding the peripheral edge of the windowpane and said other leg lying over the periphery of the windowpane and parallel to the face thereof;

an elastic sealing strip embracing the edge of the windowpane, and interposed between said primary frame and said auxiliary frame;

adhesive means adhesively connecting said windowpane and said auxiliary frame, with said elastic sealing strip being adhered neither to said auxiliary frame nor said windowpane;

connecting elements secured to said auxiliary frame and extending through openings in said elastic sealing strip and said flange of said primary frame for attachment thereto.

12. An apparatus as defined in claim **11,** further comprising holding plates for fastening the auxiliary frame on the flange of said primary frame, said holding plates having approximately right-angled cross-sections, one shank of which is fixed on the leg of the auxiliary frame arranged between the pane and the flange, and the other shank of which is provided with a hole through which passes, approximately parallel to the pane plane, a connecting element which is fastened in the flange.

13. An apparatus as defined in claim **12,** characterized in that the flange at the points of fastening is thicker, in accordance with the required connecting element, than in its remaining area.

14. An apparatus as defined in claim **12,** characterized in that the flange is widened in the points of attachment of said holding plates.

* * * * *