

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 0 752 513 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
08.01.1997 Bulletin 1997/02

(51) Int Cl.⁶: **E06B 3/663**

(21) Application number: **96304895.4**

(22) Date of filing: **03.07.1996**

(84) Designated Contracting States:
DE ES FR IT

• **Worthington, Howard John**
Staffordshire WV8 1QS (GB)

(30) Priority: **05.07.1995 GB 9513702**

(74) Representative: **Knott, Stephen Gilbert et al**
MATHISEN, MACARA & CO.
The Coach House
6-8 Swakeleys Road
Ickenham Uxbridge UB10 8BZ (GB)

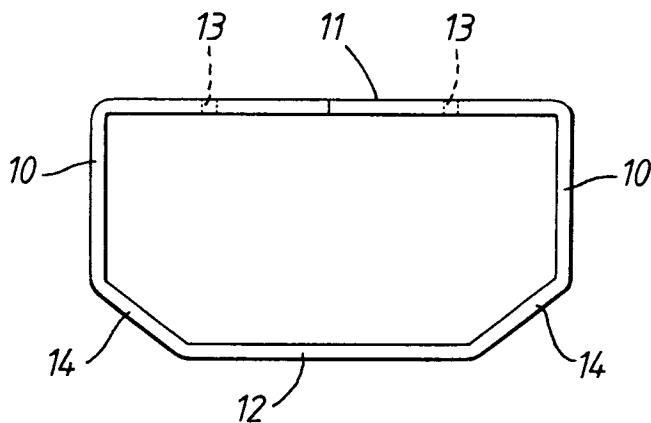
(71) Applicant: **EWS (Manufacturing) Ltd**
Wolverhampton, West Midlands WV 2 4EF (GB)

(72) Inventors:
• **Russell, Mark David**
Worcester DY13 9RY (GB)

(54) Spacer elements

(57) A spacer element for double glazed windows is formed by a strip of tinplated steel folded into a closed

section tube. The edges are welded together. The spacer tube provides a warm edge and high strength.



EP 0 752 513 A1

Description

The invention relates to spacer elements.

A spacer element is used for separating the two panes of glass in a double glazed window. The spacer element commonly has two spaced side walls which space the two panes of glass. The element is adjacent the peripheral edges of the panes.

Known are spacer elements formed from a strip of aluminium having side edges and folded into a closed tubular section in which the side edges abut one another and are connected by a weld. The weld can be made either on the inside of the section or on the exterior of the section. The sheet may have a thickness of 0.3mm to 0.4mm.

It is a problem with such a spacer element that aluminium is a comparatively expensive material. In addition, the strip needs to be of significant thickness because aluminium is not a particularly strong material. Further aluminium is a comparatively good conductor of heat and this means that heat readily passes across the tube from one pane to the other and this can lead to peripheral misting.

According to the invention, there is provided a window spacer element comprising a strip having side walls which space two panes of glass in a window, characterised in that the strip is composed of tinplated steel.

Tinplated steel has a lower heat transfer coefficient than aluminium and so the use of this material eliminates or reduces the occurrence of misting. In addition, it is a material which is comparatively less expensive than aluminium. Further, as compared with aluminium strip, the element of the invention is comparatively strong. The presence of the tinplate prevents corrosion and gives the spacer an attractive finish.

The following is a more detailed description of an embodiment of the invention, by way of example, reference being made to the accompanying drawing which is a cross-section of a spacer element in the form of a spacer tube.

The spacer tube is formed from a strip of tinplated steel. The tinplate may be applied electrolytically. Preferably, the steel is mild steel. The strip has parallel side edges and is bent into a closed section tube having the shape shown in Figure 1.

Referring to Figure 1, the tube has parallel spaced side walls 10 interconnected by an upper wall 11 and a lower wall 12, 14. The upper wall 11 is substantially planar and the side edges of the strip abut one another along a line extending along the length of the upper wall 11.

The side edges are welded together by, for example, the use of a continuously pulsed laser.

In addition, the upper wall 11 includes two parallel but spaced rows of breathing perforations 13.

The lower wall 12, 14 has a central portion 12 parallel to but spaced from the upper wall 11 and two angled portions 14 connecting the central portion to respective

ends of the side walls 10.

In use, the spacer tube is formed into a shape which is the peripheral shape of the panes of glass that are to be separated. This is done in one of two ways. The first way is to bend the tube into a shape corresponding to the peripheral shape of the two panes of glass it is to separate. The bending is about an axis normal to the planes of the side walls 10 and in such a sense that, at each bend, the smaller angle is formed by the upper wall 11 and the larger angle by the lower wall 12. The two free ends of the tube are connected by any suitable form of straight or corner connector. The second way is to cut the tube into straight lengths and, where corners are required, connect the lengths using angled connectors of known type.

The formed spacer tube is then used to space the two planes of glass; with each pane of glass contacting an associated one of the side walls 10.

The spacer tube described above with reference to the drawing has a number of advantages.

First, the tinplated steel has a comparatively low thermal conductivity. This means that, when in a double glazed unit, it does not conduct significant quantities of heat away from the side of the unit which is at the higher temperature. This resists or eliminates any tendency of the unit to mist over as a result of the warmer side of the unit having a cold edge.

Secondly, tinplated steel is a comparatively strong material, particularly as compared to aluminium. This provides a spacer tube of high strength. Alternatively, it can allow the thickness of the strip to be reduced significantly in comparison with aluminium. For example, the tinplated steel strip may be 0.15mm to 0.25mm thick.

Tinplated steel is a comparatively inexpensive material as compared to aluminium. It is readily bent and the tinplate provides an attractive corrosion proof finish.

The weld gives the spacer tube high stability and also increases its strength.

In addition, and in contrast to aluminium spacer tubes, the spacer tube described above with reference to the drawing does not require extra strength to allow it to be formed to fit a window by bending. Aluminium tube which is to be bent needs to be formed from thicker sheet than tube that is to be cut into straight lengths. For example, straight lengths of aluminium tube may be satisfactory with a thickness of 0.3mm but the thickness may need to be 0.38mm if the tube is to be bent.

The spacer tube need not have the shape described above with reference to Figure 1; it can have any suitable shape. In addition, although in the spacer tube shown the weld is provided on the exterior of the tube; the weld could be provided on the interior. Further, although the drawing discloses a spacer element in the form of a tube, the spacer element may have any known shape for spacing the panes of glass.

Claims

1. A window spacer element comprising a strip having side walls (10) which space two panes of glass in a window characterised in that the strip is composed of tinplated steel. 5
2. A window spacer element comprising a strip having side edges and being folded into a closed tubular section, the side edges abutting one another and being connected by a weld, characterised in that the strip is composed of tinplated steel. 10
3. A spacer element according to claim 2, wherein said weld is provided at the sides of said edges which are on the outside of said section. 15
4. A spacer element according to any one of claims 1 to 3, wherein the strip has a thickness of from 0.15mm to 0.25mm. 20
5. A spacer element according to any preceding claim, wherein the tinplate of said tinplated steel has been applied electrolytically. 25
6. A spacer element according to any preceding claim, wherein the tinplated steel is tinplated mild steel.
7. A window comprising two panes of glass separated by a spacer element according to any preceding claim. 30

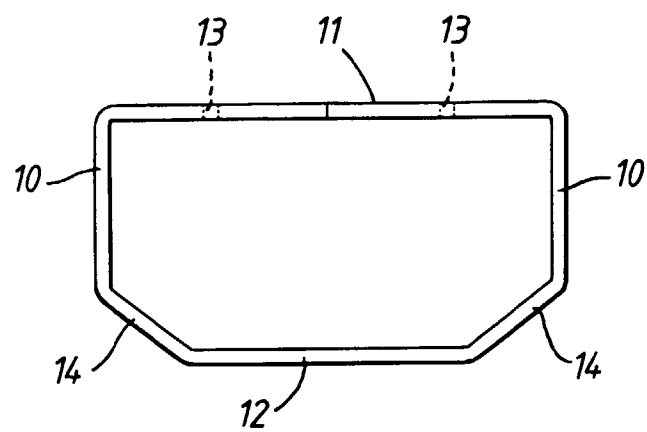
35

40

45

50

55





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 30 4895

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	DE-A-36 01 504 (GLASWERKE ARNOLD) * column 1, line 67 - column 3, line 9 * * column 3, line 59 - column 4, line 40 * * figures *	1,2,4,7 3	E06B3/663
X	FR-A-2 391 967 (BFG GLASSGROUP) * page 6, line 30 - line 36 * * page 7, line 12 - line 26 * * page 7, line 36 - page 8, line 5 * * page 10, line 1 - line 35 * * claims 1,12,13,22,23 * * figures 1,2 *	1,4-7	
X	EP-A-0 585 534 (GLASS EQUIPMENT) * column 5, line 41 - column 6, line 5; figures 1,2 *	1,4,7	
Y A	DE-A-34 00 891 (SANDER) * page 4, paragraph 1 - page 5, paragraph 4 * * page 6, paragraph 2 - page 11, paragraph 1 * * page 11, line 31 - page 12, line 14 * * figures *	3 1,2,7	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	WO-A-93 19274 (CARDINAL IG) * page 3, line 13 - line 18 * * page 6, line 21 - page 7, line 25 * * figures 1-3 *	1,2,4,7	E06B
A	DE-A-20 31 812 (IG-GLAS SPEZIALVERTRIEB) * page 5, paragraph 1 - paragraph 4; figure 3 *	1-3,7	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 3 October 1996	Examiner Depoorter, F
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)