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(54) Glass buffers.

(57) A glass buffer for use in a double glazing panel is injection moulded of a resilient thermoplastic material such as a thermoplastic elastomer or thermoplastic rubber. The two components may be physically blended, e.g. a thermoplastic olefins (TPO), or reactively combined to form polymer alloys as in the thermoplastic vulcanisates and melt-processable rubbers. Thermoplastic urethanes (TPUs) can also be used.

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TECHNICAL FIELD OF THE INVENTION

This invention relates to glass buffers, as used in glazing panels of the kind which incorporate two or more spaced panes of glass. For convenience, such glazing panels will simply be referred to below as "double glazing panels".

BACKGROUND

In double glazing panels, an array of decorative plastics profiles and connecting keys are sometimes inserted between the panes of glass, to simulate a traditional georgian-style window for example. In order to stop the panes of glass from chattering against the enclosed profiles and/or keys, e.g. due to traffic vibrations, it is common to insert resilient buffers into the plastics components to contact the panes of glass and act as dampers.

Existing glass buffers are transfer moulded using a slug of silicone rubber, but this material requires curing in the die for a significant period, resulting in a high cycle time and high component cost. An additional disadvantage of silicone rubber is that the colour range which can be achieved is very limited.

An aim of the present invention may be viewed as being to reduce the manufacturing time and cost whilst retaining the functional attributes of existing glass buffers.

SUMMARY OF THE INVENTION

The present invention proposes a glass buffer for use in a double glazing panel, which is injection moulded of a resilient thermoplastic material.

The glass buffer of the invention does not require a long period of cooling before it can be removed from the mould. In addition, by using thermoplastics based materials as opposed to silicone rubbers a wide range of colours can be achieved with little or no fading.

The preferred moulding material is a thermoplastic elastomer or thermoplastic rubber. Thermoplastic elastomers and rubbers have been commercially available since the 1960s. They are block copolymers comprising a hard thermoplastic and a resilient synthetic elastomer or natural rubber.

The two components may simply be physically blended. An example of this group which is particularly useful in the present invention is the thermoplastic olefins (TPOs), which are a blend of a polyolefin and an uncured rubber component. On the other hand, the styrenics (which incorporate polystyrene) are less suitable since they are generally only suitable for low temperature applications.

The components may also be reactively combined to form polymer alloys as in the thermoplastic vulcanisates and melt-processable rubbers, both of which can generally be used in the invention.

A third group of thermoplastic elastomers which can be used are the thermoplastic urethanes (TPUs), although their cost is generally higher than the two groups mentioned above.

BRIEF DESCRIPTION OF THE DRAWINGS

The following description and the accompanying drawings referred to therein are included by way of non-limiting example in order to illustrate how the invention may be put into practice. In the drawings:

Figure 1 is a side view of a typical glass buffer of the invention, and

Figure 2 is a transverse section II-II through the buffer.

DETAILED DESCRIPTION OF THE DRAWINGS

The illustrated glass buffer comprises a pair of head portions 1, 2 joined by a narrower waist 3. The heads are of square plan view and the waist is of square transverse section, although it will be appreciated that both could be circular outline, or indeed, of any other desired shape. The waist 3 has a pair of opposed flats 4, 5 formed across opposite corners. In addition, one of the heads 1 is formed with an axial tail 6 having a neck region 7 at its point of attachment to the head 1.

The buffer is inserted through a pre-formed aperture in a profile connector key (not shown) by first feeding the tail 6 through the key and then using the tail to pull the head 1 completely through the key. When the two heads 1, 2 abut opposite sides of the key, the waist 3 is slightly under tension to assist in holding the buffer in place. The tail 3 is normally trimmed off by cutting to provide the head 1 with a clean cut face.

The buffer is injection moulded from a thermoplastic elastomer or thermoplastic rubber. As is normal in injection moulding, the polymer granules are fed through a heated screw until viscous, whereupon the material is forced into a mould cavity. The component is allowed to cool in the mould for a short period and is then ejected from the mould and allowed to air cool.

The following thermoplastic elastomers/rubbers have been used:

1. Vitacom TPE 4203, a thermoplastic elastomer based on uncured polymers.
2. Evode Compound 273.
3. Dynamically vulcanised PP/polymer alloys, such as Santoprene 201-55 and Santoprene 201-64.
4. Dupont Alcryn 2060.

In each case the cycle times were dramatically reduced compared with transfer moulding of silicone rubber, and significant cost savings were achieved. The materials had comparable resilient qualities to

silicone rubber, were UV and colour stabilised, and maintained their resilience throughout a normal working temperature range of -20°C to 100°C. The materials had a greater attainable colour range with little or no colour fading. U.v./fogging tests (as detailed in BS 5713 : 1979 - Hermetically Sealed Flat Double Glazing Units) showed that there was no detectable fogging from volatile materials inside the glazing panel.

It will be appreciated that the invention is equally applicable to glass buffers of the kind having a single head secured to a fixing stud. In addition, the buffers could be inserted into the extruded profile instead of the connecting keys, and indeed, they could be used in any other position within a double glazing panel where an anti-rattle buffer is required.

Claims

1. A glass buffer for use in a double glazing panel, characterised by being injection moulded of a resilient thermoplastic material.

2. A glass buffer according to Claim 1, formed of a thermoplastic elastomer or thermoplastic rubber.

3. A glass buffer according to Claim 2, in which the resilient thermoplastic material comprises a physical blend of a thermoplastic and a relatively resilient elastomer or natural rubber.

4. A glass buffer according to Claim 3, formed of a thermoplastic olefin.

5. A glass buffer according to Claim 2, in which the resilient thermoplastic material comprises a reactively combined thermoplastic and a relatively resilient elastomer or natural rubber.

6. A glass buffer according to Claim 5, formed of a thermoplastic vulcanisate.

7. A glass buffer according to Claim 5, formed of a melt-processable rubber.

8. A glass buffer according to Claim 1 or 2, formed of a thermoplastic urethane.

9. A glass buffer according to any preceding claim, comprising two heads joined by a narrower waist and having a tail attached to one of the heads.

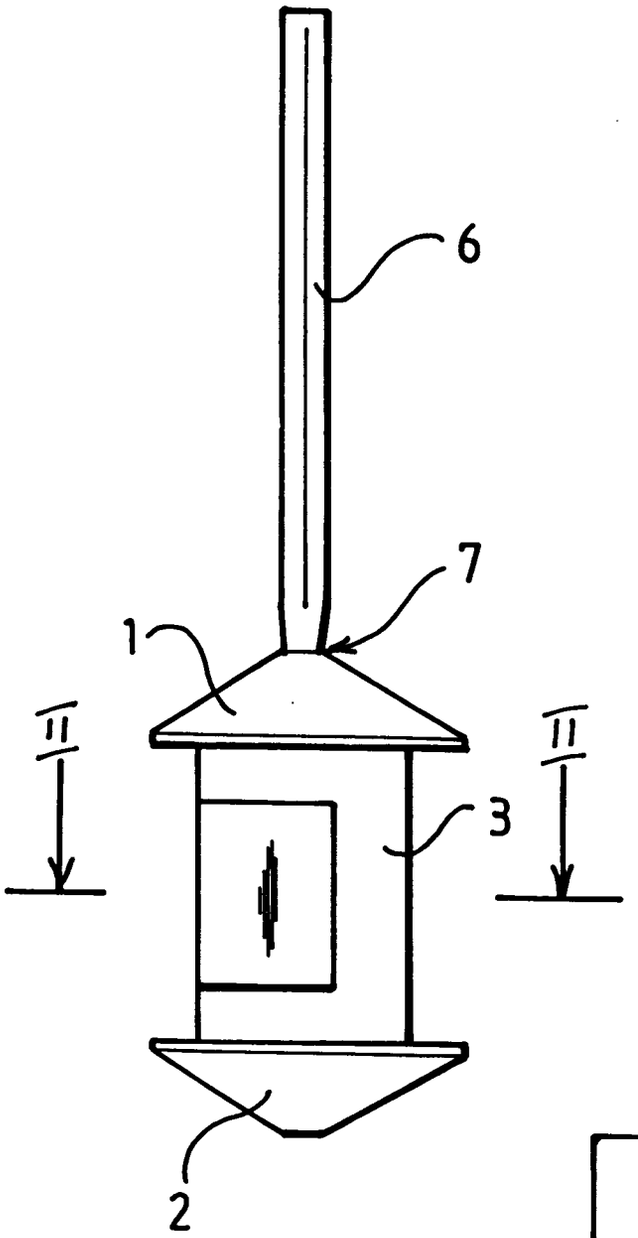

FIG 1

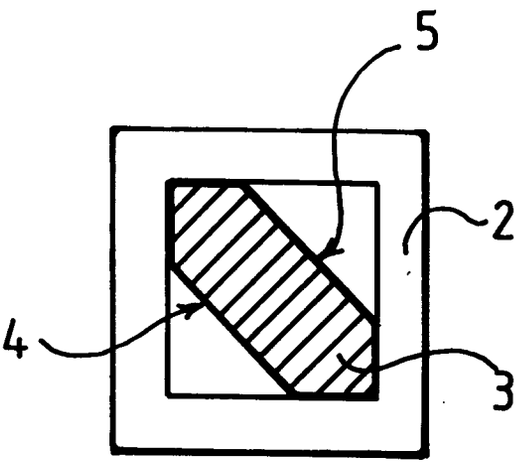

FIG 2