(12) UK Patent Application (19) GB (11) 2 299 664 (13) A

(43) Date of A Publication 09.10.1996

(21) Application No 9506752.6

(22) Date of Filing 31.03.1995

(71) Applicant(s)
Hardware & Systems Patents Limited

(Incorporated in the United Kingdom)

100 Fetter Lane, LONDON, EC4A 1BN, United Kingdom

(72) Inventor(s)
Arthur David Tippin
Peter James Harrison

(74) Agent and/or Address for Service
Audrey Knowles & Co
624 Pershore Road, Selly Park, BIRMINGHAM, B29 7HG, United Kingdom

(51) INT CL^6
F24F 13/08

(52) UK CL (Edition O)
F4V VGBE V161

(56) Documents Cited
GB 2277372 A **GB 2234582 A** **GB 0499691 A**
EP 0056173 A

(58) Field of Search
UK CL (Edition N) **F4V VFYM VFYN VGAB VGBB VGBE VGBJ VGBN VGBP VGBV VGBX**
INT CL^6 **F24F**

(54) **Ventilator**

(57) A ventilator 1 for controlling airflow through a slot 10 extending through a window frame 3 has a flap 8 pivotally connected to an apertured insert 7 that is an interference push fit in the slot 10 for mounting the ventilator 1 without the use of separate fixing screws.

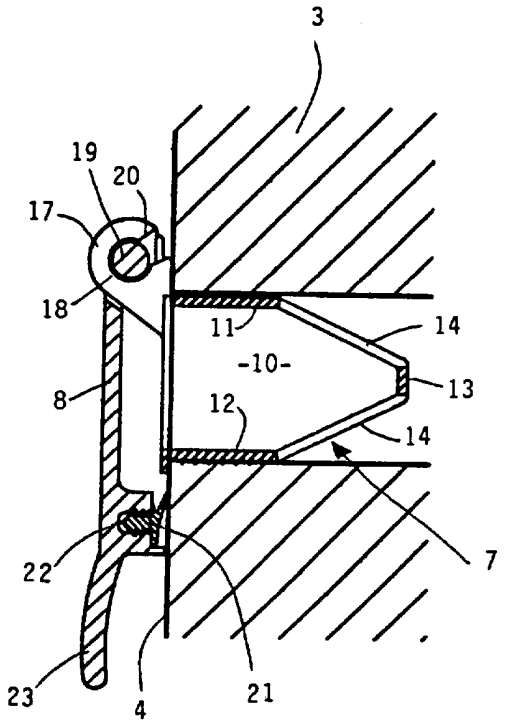

FIGURE 4.

GB 2 299 664 A

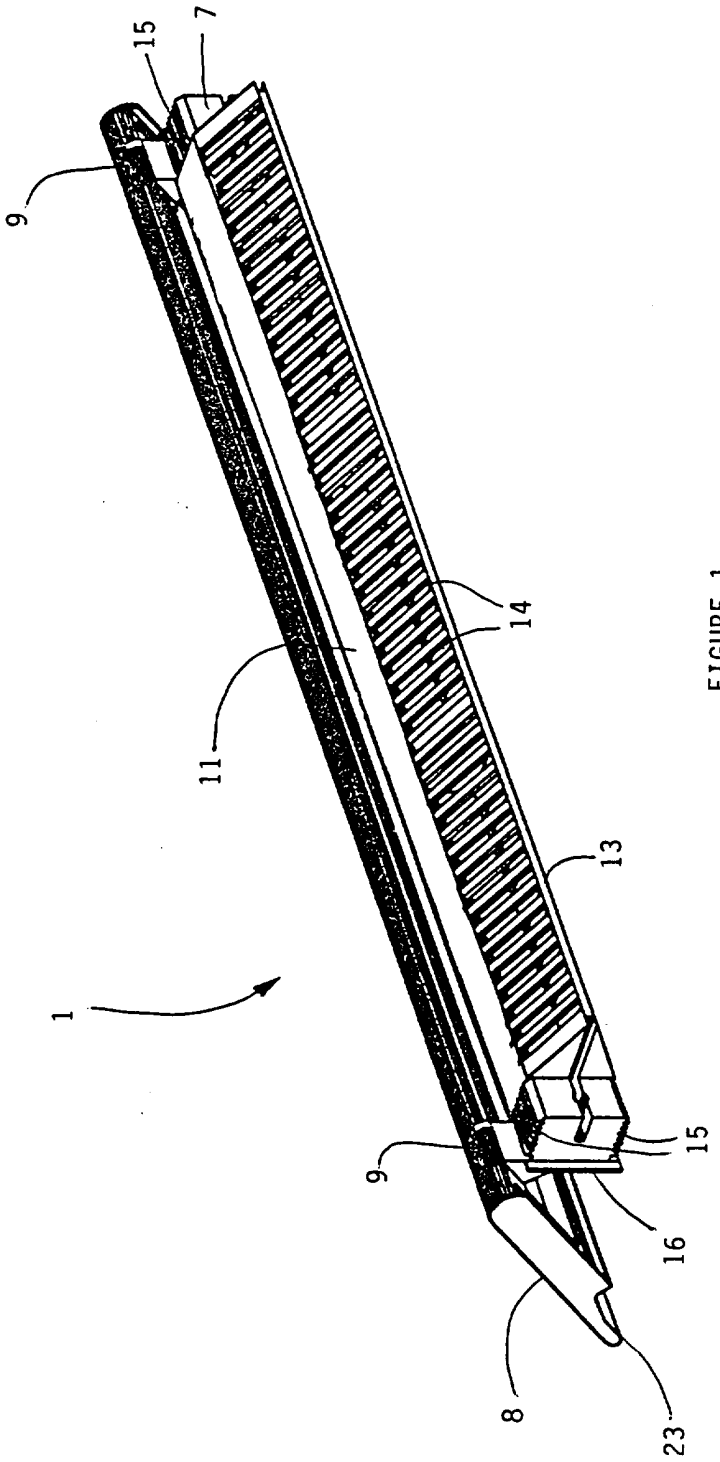

FIGURE 1.

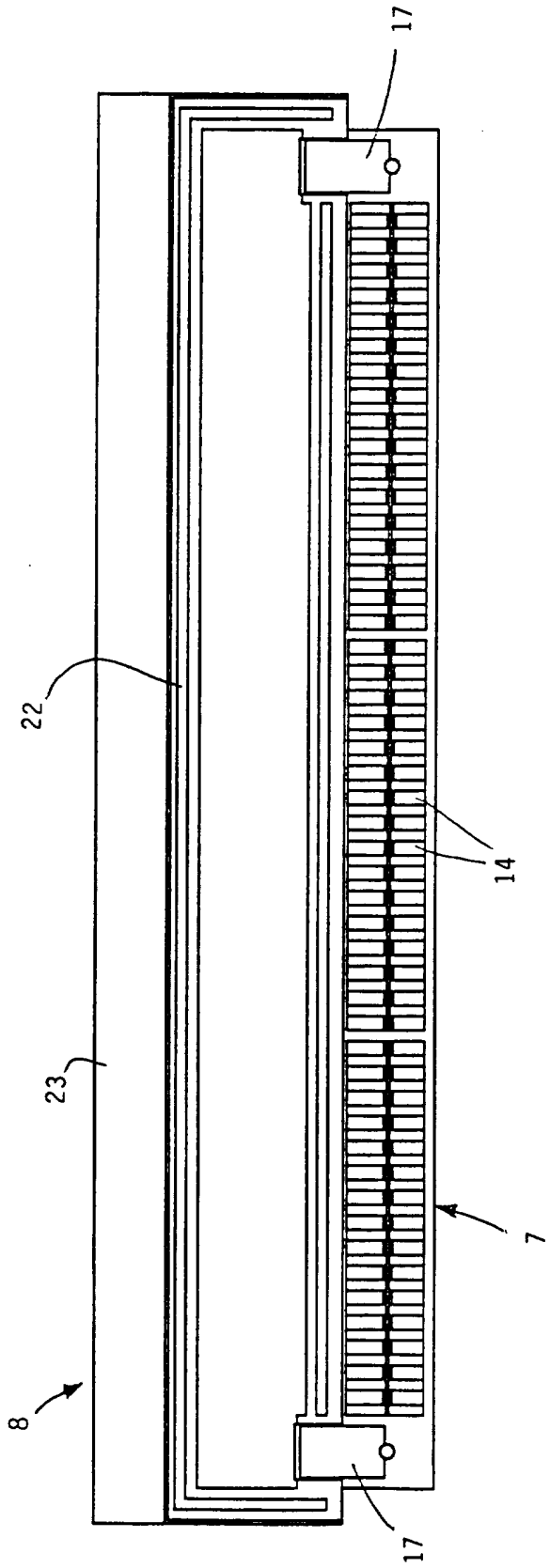

FIGURE 2

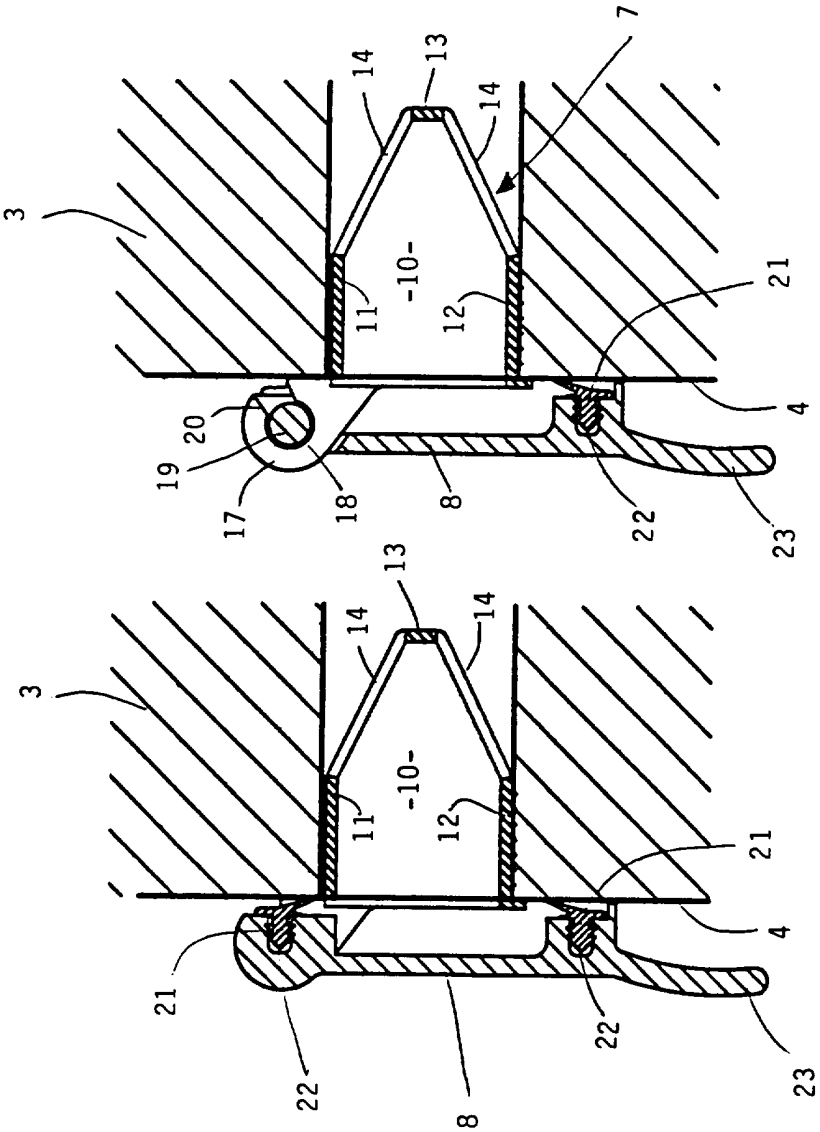

FIGURE 4.

FIGURE 3.

2299664

VENTILATOR

This invention relates to ventilators for windows and doors.

The invention is particularly concerned with ventilators having an occluding member that is operable to open and close a slot formed through a frame of a window or door to control air flow. Ventilators of this type are well known and various constructions have been proposed and used previously.

Typically, the ventilator is fixed to the inner face of the frame by screws so as to overlie the slot. Face fixing requires accurate positioning of the screw holes to align the ventilator with the slot and, when fitted, the ventilator increases the overall dimensions of the frame. As a result, manufacturing costs are increased and the ventilator can be damaged if frames to which it has been fitted are stacked for storage and transportation. In addition, the screws are unsightly and the provision of caps to cover the screws adds further to manufacturing costs.

It is an object of the present invention to provide a slot ventilator which can be fitted to a frame without the use of separate fixings such as screws and which, when fitted, does not increase significantly the overall dimensions of the frame.

According to the present invention we provide a ventilator for mounting in a slot formed in a frame of a window or door, the ventilator comprising support means for an occluding member arranged for movement to control the flow of air through the slot wherein the support means is an interference fit in the slot such that the ventilator is retained in position by frictional engagement of the support means in the slot.

By employing frictional engagement of the support means in the slot, the ventilator is secured to the frame without the use of separate fixing screws and, when fitted, does not increase substantially the overall dimensions of the frame.

Preferably, the occluding member is positioned to overlie the slot and is movable between a closed position and a fully open position to control the flow of air through the slot.

The occluding member may be mounted for sliding movement between the closed and fully open positions but more preferably the occluding member is mounted for pivotal movement between the closed and fully open positions.

Advantageously, the occluding member comprises an elongate flap pivotally connected to the support means by complementary hinge formations. The complementary hinge formations may comprise a pin received within a part-circular recess at each end of the ventilator

Preferably, the complementary hinge formations are engageable with a snap-action for assembly of the flap and may be arranged to prevent the flap being dis-assembled when the ventilator is installed in the slot.

Advantageously, the complementary hinge formations provide frictional resistance to pivotal movement of the flap for holding the flap in any selected position between the closed and fully open positions.

Preferably, the flap and support means have inter-engageable formations for holding the flap in the closed position.

Advantageously, the flap is pivotal about a hinge axis at the uppermost edge and the lowermost edge provides handle for operating the flap which is preferably spaced from the inner face of the frame when the flap is closed. For example the lower edge of the flap may be angled away from the inner face of the frame when the flap is closed.

Preferably, the flap is provided with a resilient seal member on the rear face for engagement with the inner face of the frame around the slot when the flap is closed.

Advantageously, the support means comprises an elongate insert with a central aperture bounded by upper and lower walls that is received within the slot and has formations which provide the interference fit to retain the insert in the slot by frictional engagement. For example, the interference fit may be provided by external ribs or serrations on the upper and/or lower walls.

Preferably, the insert includes an integral grill for preventing entry of insects through the slot when the ventilator is open. The grill may be of V-shape with a series of narrow slots providing a total cross-sectional area equal to that of the insert aperture so that the grill does not restrict air flow.

A weatherhood may be provided to overlie the slot on the outer face of the frame to prevent rain penetration and reduce draughts. The weatherhood may have a part that is received in the slot to secure the weatherhood by frictional engagement similar to the ventilator.

Other features, benefits and advantages of the invented ventilator will be apparent from the following description of an exemplary embodiment with reference to the accompanying drawings, wherein:-

FIGURE 1 is a rear perspective view of a ventilator according to the invention with the flap open;

FIGURE 2 is a front view of the ventilator with the flap open;

FIGURE 3 is a sectional view of the ventilator adjacent to a flap hinge with the ventilator shown mounted in a slot in a window frame and the flap closed; and

FIGURE 4 is a sectional view similar to Figure 3 through a flap hinge.

Referring to the drawings, the ventilator 1 is shown mounted in a slot 2 formed in a frame 3 of a window or door to provide an air passageway that extends between an inner face 4 and an outer face (not shown) of the frame 1.

In this embodiment, the frame 1 is of timber construction but this is not essential and the frame 1 may be made of other materials, for example metal or plastics.

The ventilator 1 comprises an elongate insert 7 that is received within the slot 2 and an elongate flap 8 connected to the insert 7 at each end of the ventilator 1 by a respective hinge 9 for pivotal movement between a closed position shown in Figures 3 and 4 and a fully open position shown in Figure 2.

In this embodiment, the insert 7 and flap 8 are plastics mouldings with integral hinge formations for simple and easy assembly of the ventilator 1.

The insert 7 has an elongate aperture 10 bounded by parallel upper and lower walls 11 and 12 respectively from which an integral grill 13 of V-shape extends towards the outer face of the frame 1.

The grill 13 is formed with a series of narrow openings 14 which prevent entry of insects through the slot 2 when the ventilator 1 is open. The total cross-sectional area of the openings 14 is equal to that of the aperture 10 so that the grill 13 does not restrict the air flow through the slot 2. Dirt entrained in the air flow may be trapped by a strip of reticular foam located in the slot.

The upper and lower walls 10 and 11 are formed at each end of the insert 7 with external ribs 15 to provide a tight interference fit so that the insert 7 is held in place by frictional engagement of the ribs 15 in the slot 2.

A lip 16 provides an abutment at the front edge of the insert 7 that seats against the inner face 4 of the frame 3 to locate the insert 7 in the slot 2.

Each hinge 9 comprises an integral knuckle 17 that extends forwardly from the uppermost front edge of the insert 7 and is formed with a part-circular recess 18 for reception of an integral pin 19 at the uppermost edge of the flap 8.

The recess 18 has a rearwardly facing entry 20 so that the pin 19 can engage the recess 18 with a snap action for assembly of the ventilator 1 and is prevented from disengaging the recess 19 when the ventilator 1 is mounted in the slot 2.

The pin 19 is an interference fit in the recess 18 so that the hinge 9 can maintain the flap 8 in any selected position between the closed and fully open positions by frictional inter-engagement of the pin 19 and recess 18.

The flap 8 is secured in the closed position by inter-engagement of co-operating formations (not shown) on the rear face of the flap 8 and the front edge of the lower wall 11 of the insert 7.

A rubber gasket 21 is located in a groove 22 in the rear face of the flap 8 and is resiliently compressed against the inner face 4 of the frame 3 around the slot 2 when the flap 8 is secured in the closed position to provide an airtight seal with any irregularities in the inner face 4 of the frame 1 being accommodated by the resilience of the gasket 21 to maintain the seal.

The lowermost edge of the flap 8 provides a handle 23 for operating the flap 8 that is angled away from the inner face 4 when the flap 8 is closed to facilitate actuation.

As will now be appreciated, the invented ventilator is designed for a simple push-fit in the slot in the frame and is secured by frictional engagement of the insert in the slot without the use of separate fixings such as screws.

When fitted to the frame, the flap is generally parallel and close to the inner face of the frame when closed so that the ventilator is compact and the slim profile of the flap does not increase substantially the external dimensions of the frame. As a result, frames fitted with the ventilator can be stacked for storage and transportation with reduced risk of damage to the ventilator.

It will be understood that the invention is not limited to the embodiment above-described. For example, the frictional engagement of the insert in the slot may be provided by any suitable formations which may extend for all or part only of the length of the insert.

The support means for mounting the flap may be provided by a single insert as described or by a pair of separate inserts at each end of the flap with each insert providing a hinge mounting for the flap and being a push fit in the slot to secure the ventilator by frictional engagement.

The occluding member may be a pivotal flap as described or a member supported by the insert for sliding movement to open and close a series of openings in the insert.

The ventilator may include an external weatherhood arranged to overlie the slot on the outer face of the frame to prevent rain penetration. The weatherhood may incorporate a grill to exclude insects in addition to or in place of the insert grill. The weatherhood may be provided with a part for reception in the slot to secure the weatherhood by frictional engagement in the slot similar to the ventilator.

The ventilator may be installed in a slot formed in a fixed frame or an opening frame of a window or door and is generally positioned on a horizontal frame member at the top or bottom of the frame although other positions may be employed depending on the requirements.

Claims:

1 A ventilator for a window or door comprises support means for an occluding member arranged for movement to control the flow of air through a slot formed in a frame of a window or door wherein the support means is adapted to be an interference fit in the slot such that the ventilator is retained in position by frictional engagement of the support means in the slot.

2. A ventilator according to Claim 1 wherein the occluding member is movable between a closed position and a fully open position to control the flow of air through the slot.

3. A ventilator according to Claim 2 wherein the occluding member is arranged for sliding movement between the closed and fully open positions.

4. A ventilator according to Claim 2 wherein the occluding member is arranged for pivotal movement between the closed and fully open positions.

5. A ventilator according to Claim 4 the occluding member comprises an elongate flap pivotally connected to the support means by complementary hinge formations.

6. A ventilator according to Claim 5 wherein the complementary hinge formations comprise a pin received within a part-circular recess at each end of the ventilator

7. A ventilator according to Claim 5 or Claim 6 wherein the complementary hinge formations are engageable with a snap-action for assembly of the flap and support means.

8. A ventilator according to any one of Claims 5 to 7 wherein the complementary hinge formations are arranged to prevent the flap being disassembled from the support means when the ventilator is fitted to the frame.

9. A ventilator according to any one of Claims 5 to 8 wherein the complementary hinge formations provide frictional resistance to pivotal movement of the flap for holding the flap in any selected position between the closed and fully open positions.

10. A ventilator according to any one of Claims 4 to 9 wherein the flap and support means have inter-engageable formations for holding the flap in the closed position.

11. A ventilator according to any one of Claims 4 to 10 wherein the flap is pivotal about a hinge axis at or adjacent one edge and the other edge provides a handle for operating the flap.

12. A ventilator according to Claim 11 wherein the handle is adapted to be spaced from the inner face of the frame when the flap is closed.

13. A ventilator according to Claim 12 wherein the handle edge of the flap is angled away from the frame when the flap is closed.

14. A ventilator according to any one of Claims 4 to 13 wherein the flap is arranged to overlie the slot in the closed position.

15. A ventilator according to Claim 14 wherein the flap is provided with means for sealing around the slot in the closed position.

16. A ventilator according to Claim 15 wherein the sealing means comprises a resilient seal member located on a rear face of the flap for engagement with the frame in the closed position.

17. A ventilator according to any one of the preceding Claims wherein the support means comprises an elongate insert with a central aperture bounded by upper and lower walls that is adapted to be received within the slot and has formations which provide the interference fit to retain the insert in the slot by frictional engagement.

18. A ventilator according to Claim 17 wherein the interference fit is provided by external ribs, serrations or like formations on the upper and/or lower walls of the insert.

19. A ventilator according to Claim 17 or Claim 18 wherein the insert includes an integral grill for preventing entry of insects through the slot when the ventilator is open.

20. A ventilator according to Claim 19 wherein the grill is of V-shape with a series of narrow slots providing a total cross-sectional area approximately equal to that of the insert aperture.

21. A ventilator for a window or door substantially as hereinbefore described with reference to the accompanying drawings.

22. A frame for a window or door having a slot extending between inner and outer faces of the frame and a ventilator according to any one of the preceding Claims for controlling air flow through the slot, the ventilator being mounted on the inner face by engagement of the support means in the slot.

23. A frame according to Claim 22 including a weatherhood arranged to overlie the slot on the outer face of the frame.

24. A frame according to Claim 23 wherein the weatherhood has mounting means that is an interference fit in the slot such that the weatherhood is

retained in position by frictional engagement of the mounting means in the slot.

25. A frame according to any one of Claims 22 to 24 wherein the slot is formed in horizontal frame member.

26. A weatherhood for a ventilation slot extending between inner and outer faces of a frame of a window or door has mounting means that is an interference fit in the slot such that the weatherhood is retained in position by frictional engagement of the mounting means in the slot.

27. A ventilator assembly for a slot extending between inner and outer faces of a frame of a window or door comprises a first unit for mounting to the inner face and a second unit for mounting to the outer face, the first unit including an occluding member for controlling air flow through the slot, and at least one unit being provided with locating means that is an interference push fit in the slot such that the unit is retained in position by frictional engagement of the locating means in the slot.

Patents Act 1977 Examiner's report to the Comptroller under Section 17 (The Search report)	Application number GB 9506752.6
Relevant Technical Fields (i) UK Cl (Ed.N) F4V: VFYM, VFYN, VGAB, VGBB, VGBE, VGBJ, VGBN, VGBP, VGBV, VGBX (ii) Int Cl (Ed.6) F24F	Search Examiner MR G WERRETT Date of completion of Search 26 JUNE 1995
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii)	Documents considered relevant following a search in respect of Claims :- 1-27

Categories of documents

X:	Document indicating lack of novelty or of inventive step.	**P:**	Document published on or after the declared priority date but before the filing date of the present application.
Y:	Document indicating lack of inventive step if combined with one or more other documents of the same category.	**E:**	Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A:	Document indicating technological background and/or state of the art.	**&:**	Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2277372 A	(C T RUSSHARD) see Figure 1	1,26,27
X	GB 2234582 A	(GLIDEVALE) see retaining members 28	1,26,27
X	GB 499691	(CHATSWORTH) whole document	1,26,27
X	EP 0056173	(ROUWENHORST) see Figure 4	1,26,27

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).