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(56) Documents Cited:
GB 2304784 A **GB 2296740 A**
GB 2246807 A **GB 2241531 A**

(58) Field of Search:
UK CL (Edition X) **E2A**
INT CL **E05B, E05C**
Other: **Online: EPODOC, WPI**

(54) Abstract Title: **Reversible keep**

(57) This invention relates to a keep, and in particular to a keep for use with an espagnolette-type locking arrangement for a opening window or door. The keep has at least two channels 26a, 26b, 30a, 30b, respectively defining a fully-closed and partially-closed position of the panel in use, and the keep also has a first formation 12 and a second formation 14 which are adapted to engage the frame (20, Fig. 8) and define the position of the keep relative to the profile (16, Fig. 8) of the frame. In the present invention the keep is reversible and the first channel is spaced from the first formation by a distance which is different to the spacing of the second channel from the second formation, such that when the keep is reversed the spacing between the keep and frame to which it is attached is altered. The keep may be reversed to allow a window or door with a different thickness of gasket to be locked.

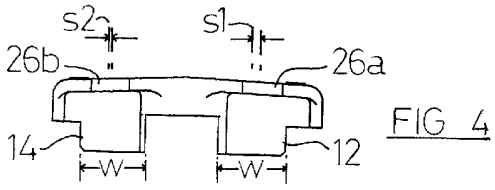

FIG 4

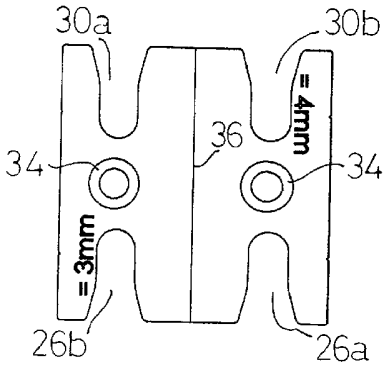

FIG 5

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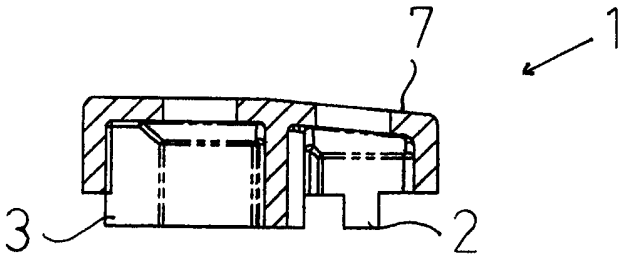

FIG 1

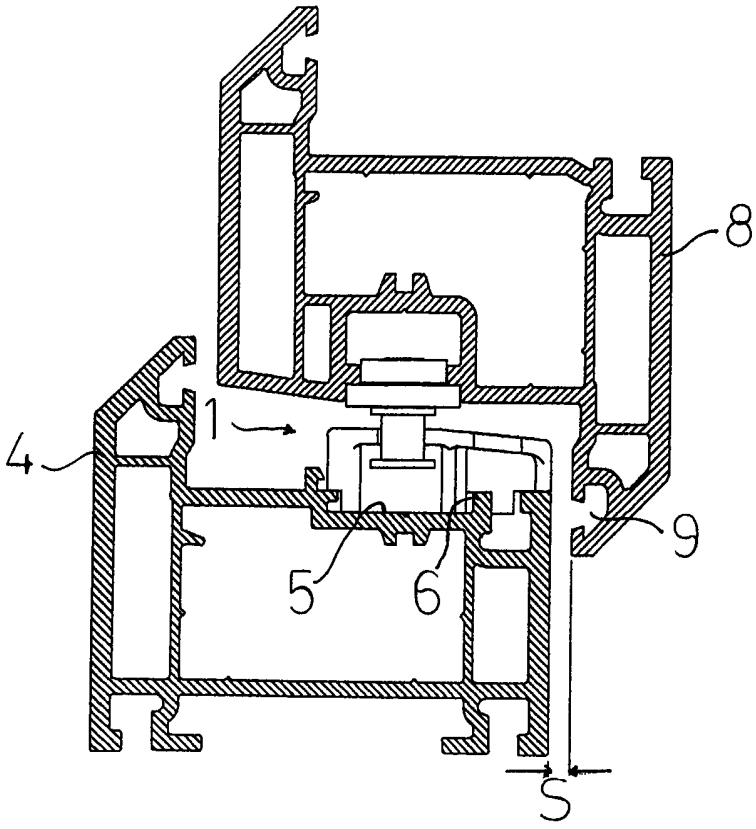

FIG 2

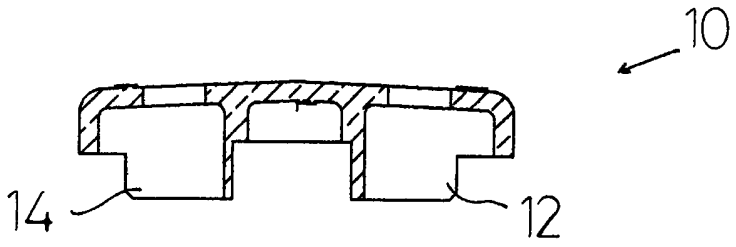

FIG 3

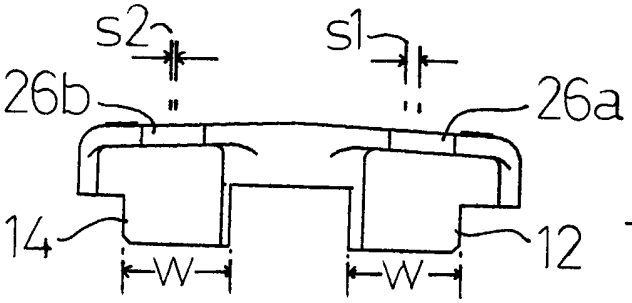

FIG 4

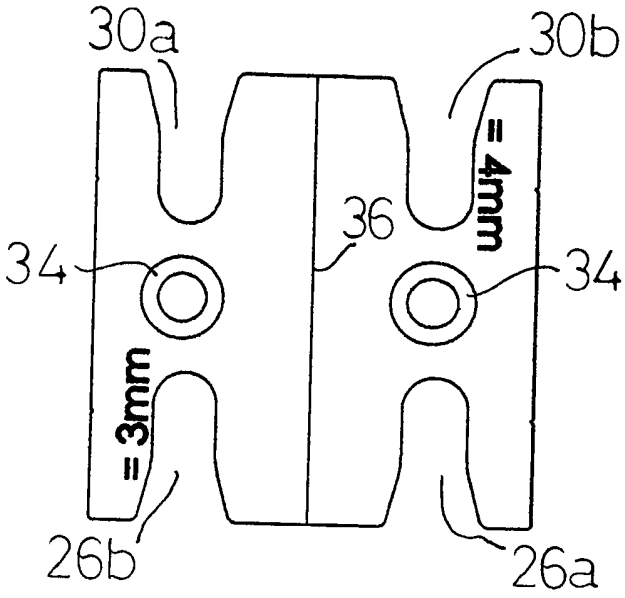

FIG 5

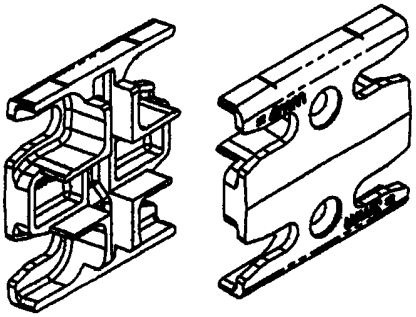

FIG 7

FIG 6

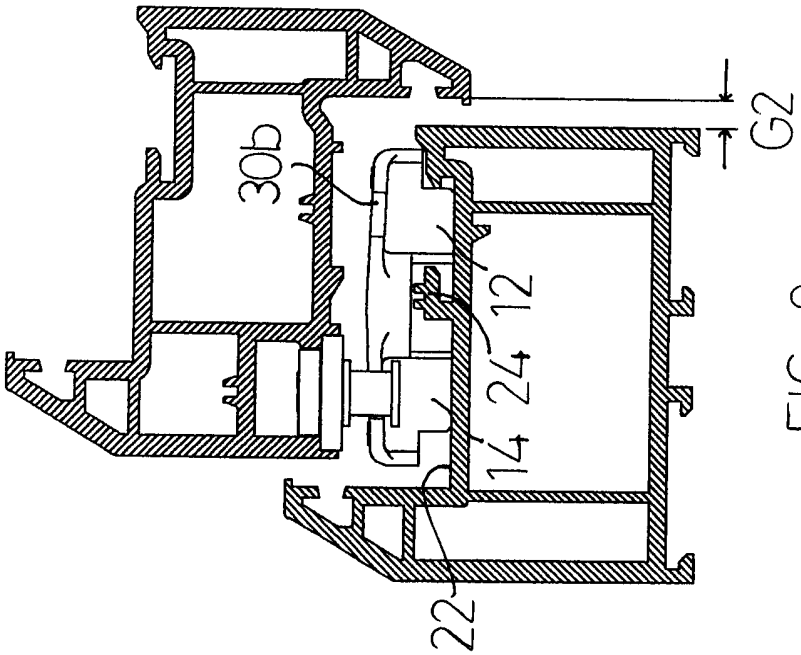

FIG 9

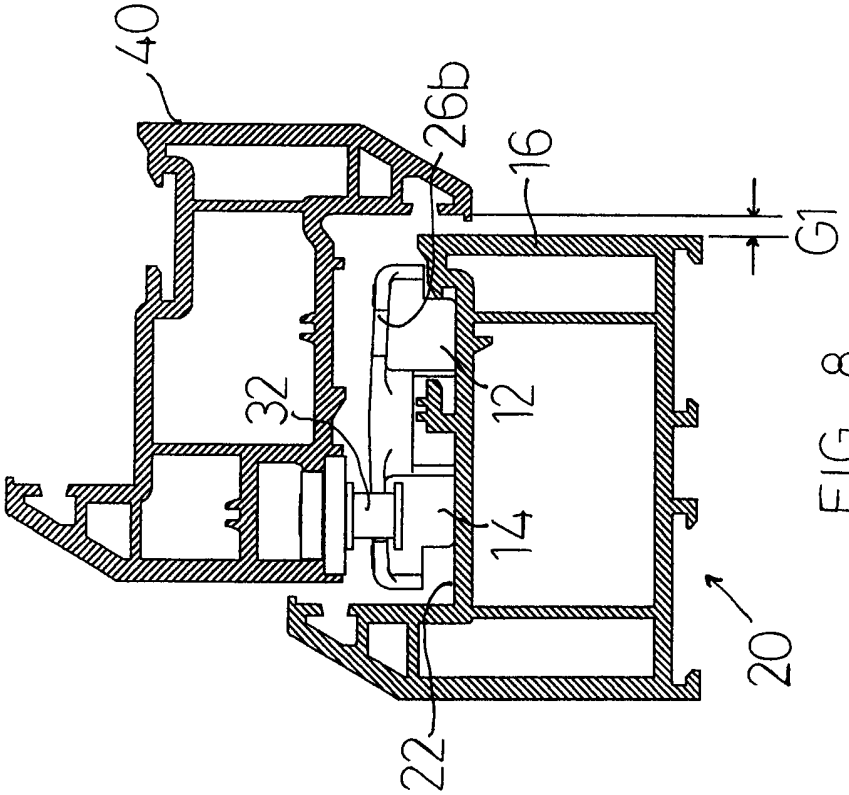

FIG 8

KEEP

FIELD OF THE INVENTION

This invention relates to a keep, and in particular to a keep for use with an espagnolette-type locking arrangement for a opening window or door.

BACKGROUND TO THE INVENTION

The following description and disclosure is for convenience directed to a window, and in particular to a hinged window. It will, however, be understood that the invention is equally applicable to other hinged panels such as doors, and to sliding panels such as patio windows or doors.

Also, in the following description the window is defined as being rectangular and having a hinged edge, a locking edge opposed to the hinged edge, and two connecting edges joining the hinged edge and the locking edge. (It is recognised that in some windows the hinges are in the form of friction stays which are mounted upon the connecting edges, but the above terminology will still be used for clarity.)

A hinged window is often locked or otherwise secured to the surrounding frame by a multi-point locking arrangement, in which a lock or other securing means is typically located on the locking edge and can drive a plurality of locking members into engagement with respective keeps located around the window frame.

If the window is made of aluminium or plastics it will typically incorporate extruded lengths of largely-hollow profile, and some or all of the lock componentry can be located within the profile and so be substantially hidden from view.

DESCRIPTION OF THE PRIOR ART

Many multi-point locking arrangements are known, and several employ an espagnolette arrangement in which a gearbox and elongated locking bar are mounted to the locking edge, the locking bar carrying a plurality of mushroom headed locking members which can all be driven (together) by the gearbox into

and out of engagement with respective keeps, to effect locking and unlocking of the window, respectively.

The mushroom-headed bolts will typically locate into a channel formed in the keep, it being typical for a keep to have two channels, one defining a fully closed position of the window, the other a slightly-open or "night vent" position.

Window manufacturers who make aluminium or plastics windows from hollow extrusions will typically have their own unique extrusion profile, notwithstanding that certain design features are standardised. The manufacturers of hardware such as keeps must make their products to match the profile of each particular manufacturer, and will seek to minimise the number and variety of products they produce by seeking to make products which fit as many different manufacturer's profiles as possible. In practice, whilst the presence of a channel in the frame profile into which the keeps can fit is a more-or-less standard feature, the channel will typically contain beads, rails or other projections which vary between profiles, and the hardware manufacturer will seek to design a keep to accommodate the beads and other projections present in as many as possible of the different profiles.

The window will be located in a surrounding frame, and a number of sealing gaskets will be located between the window and the frame. The gaskets can vary in size, in type, and in the material from which they are made. One type of gasket is known as a bubble gasket, and includes a hollow tube of resilient material. When the gasket is engaged the tube is compressed laterally, and seals by virtue of the tube material seeking to regain its uncompressed size and shape.

Another type of gasket is a flipper gasket, employing a flap of resilient material which is partially flattened as the gasket is compressed. This type of gasket seals by seeking to regain its unflattened form.

When manufacturing a window, the window manufacturer will seek to ensure that the window when fully closed compresses the gaskets sufficiently to provide effective weatherproofing, and yet does not seek to over-compress the gaskets, which over-compression will make locking the window more difficult, and may result in long-term failure of the gasket and unnecessary load upon the hinges and the locking components.

The relative position between the window and its frame when the window is fully closed is determined by the lock members and the keeps, and the window manufacturer must know both the position of the lock members relative to the window, and of the keeps relative to the frame, if the correct compression of the gaskets is to be attained. Typically, however, the lock members and keeps will be manufactured separately from the window, and so it is necessary that the hardware manufacturer(s) make these components precisely to fit the particular window, or else design in sufficient freedom of movement in the mounting of these components to allow the window manufacturer sufficient freedom to fit "standard" componentry to his window.

The former option is seldom undertaken since the volumes in which a particular window profile will be made rarely justify the design and manufacture of dedicated componentry. In addition, some flexibility would invariably be required to accommodate for manufacturing tolerances in the window manufacturing process. Furthermore, if the window manufacturer changes the type, size or material of the gasket(s), then the dedicated componentry which was previously used may no longer be suitable. Thus, for example, bubble gaskets can be made in a number of different materials, and their resistance to compression depends upon the material from which the gasket is made; changing the material can change the position which the window must adopt relative to the frame for effective weatherproofing.

In addition, it is not unusual for a window manufacturer to purchase lengths of window profile from (for example) a plastics extruder, and to cut and assemble windows therefrom. The same plastics extruder may supply many window manufacturers with the same profile and so in theory the shoot bolt and keep manufacturers could make standard componentry to fit that profile. However, this is not possible in practice since different window manufacturers will often use different gaskets, and the relationship between the window and its frame must be adjustable to accommodate all of those gaskets.

Also, some window manufacturers assemble windows from extruded lengths to which the gasket material has already been fitted. When the profile is cut to length and welded at the corners the pre-fitted gasket material can become hardened and lose some of its resilience, so increasing the required gap between

the window and frame.

Accordingly, a shoot bolt and keep manufacturer will typically seek to make its componentry as standardised as possible, but will need to build in sufficient adjustability to accommodate the differing requirements expected of the various window manufacturers.

A known method of introducing flexibility into the componentry is to use slots instead of holes for the fixing means of the keeps, the slots allowing adjustment in the position of the keeps relative to the frame, and thus adjustment in the position of the window relative to the frame when the window is fully closed and the locking bars engage the keeps.

This method has a number of disadvantages. Firstly, the method of adjustment is not desired by the window manufacturers, who would prefer to fit a standard component in a predetermined position upon the windows with a minimum of control steps in the manufacturing process. Also, the fastenings of the keep may migrate along the slots over time, reducing the compression upon the gaskets and possibly resulting in a leaking window. Furthermore, the adjustability provided by the slots may be precluded or limited by other componentry, for example the keep may engage a bead of the frame profile which avoids or limits the adjustment of the keeper regardless of the provision of the slots.

SUMMARY OF THE INVENTION

The object of the present invention is to provide a keep which reduces or avoids the above-stated disadvantages with the known keeps. The invention can be used with espagnolette arrangements as described above, with shoot bolt locking arrangements, and other multi-point locking arrangements.

According to the invention there is provided a keep for use in securing a movable panel relative to its frame, the keep having a first channel and a second channel respectively defining a fully-closed and partially-closed position of the panel in use, the keep having a first formation and a second formation, the formations being adapted to engage the frame and define the position of the keep relative to the profile of the frame, characterised in that the keep is reversible and in that the

first channel is spaced from the first formation by a distance different to the spacing of the second channel from the second formation.

In use the position of the keep relative to the frame is determined by engagement of the respective formation or formations with the frame, which in turn defines the position of the channels relative to the frame and consequently the compression upon the gaskets. By virtue of the different spacing between the first channel and the first formation, and the second channel and the second formation, reversing the keep will adjust the position of the channels relative to the frame, and so adjust the compression upon the gaskets.

It will be understood that only two adjustment positions are possible. It will also be understood that the resilience of the gasket material effectively provides some adjustment within a small range, so that two adjustment positions for the channels of the keep are believed to be all that is required in the vast majority of cases.

Preferably, the difference in spacing between the first channel and the first formation, and the second channel and the second formation, is less than 2 mm, and is ideally 1 mm. Since adjustment is typically required only to accommodate changes in the gasket type or material, such a small difference in spacing is likely to be all that is required in the vast majority of cases.

It is known that the top surface of the keep is tapered (or sloping) to accommodate the path of movement of a window fitted with friction stays; in the present invention the top surface is preferably tapered to both front and back to provide a taper in both of the available positions of the keep.

Desirably, the keep has four channels arranged in two pairs. The first pair of channels provides the fully-closed and partially-closed positions when the keep is arranged in its first position, the second pair of channels provides the fully-closed and partially-closed positions when the keep is arranged in its second position.

Preferably, the channels are symmetrically located in the keep. Thus, preferably the location and/or size of the formations are not symmetrical. If the keep has tapers the length and angle of the tapers is preferably symmetrical also.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig.1 shows a sectional end view of a prior art keep;

Fig.2 shows a section through a window profile with a fitted locking member and a frame profile with a fitted keep according to Fig.1;

Fig.3 shows a sectional end view of a keep according to the present invention

Fig.4 shows an end view of the keep of Fig.3;

Fig.5 shows a plan view of the keep of Fig.3;

Fig.6 shows a perspective view from above of the keep of Fig.3;

Fig.7 shows a perspective view from below of the keep of Fig.3;

Fig.8 shows a section through a window profile with a fitted locking member and a frame profile with a fitted keep according to the present invention in a first position; and

Fig.9 shows a section as Fig.8 with the keep in a second position.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The prior art keep 1 of Figs.1 and 2 is of metal, usually a diecasting. The keep has formations 2,3 which in use engage the profile 4 of the frame, usually within the groove 5 which is provided for this purpose. It will be seen that the formations 2,3 are designed to fit to the particular profile 4, and in particular are designed to fit within the groove 5 and accommodate any rails or beads of the profile, such as 6.

The front edge of the keep is tapered at 7 in known fashion, to accommodate the path of opening movement of the window 8 which is mounted upon friction stays (not seen).

The profile of the window has a recess 9 into which a sealing gasket (not shown) can be fitted. It will be understood that in this embodiment the sealing gap S is fixed by virtue of the fixed position of the keep 1 relative to the frame profile 4. An (internal) sealing gasket may also be fitted to a corresponding recess, if desired.

The keep 10 according to the present invention is shown in detail in Figs. 3-7, and is shown in use in Figs. 8 and 9. The keep is also preferably of metal, ideally a diecasting, and has formations 12, 14 which in use engage the profile 16 of the frame 20 (see Figs. 8,9), and in particular lie within the groove 22 provided for this purpose. Once again, it will be seen that the formations 12,14 are designed to fit to the particular profile 16, and in particular are designed to fit within the groove 22 and accommodate the bead 24 of the profile.

As seen in Fig.5, the keep 10 has four channels arranged in two pairs, respectively 26a, 26b and 30a, 30b. The channels 26a, 26b provide respectively a fully closed position and a partially-closed ("night vent") position for the window when the keep is in a first position (see Fig. 8), and the channels 30a, 30b provide respectively a fully closed position and a partially-closed position for the window when the keep is in a second position (see Fig. 9). The channels all have tapered openings, to facilitate ease of entry of the locking member 32, in known fashion.

It is recognised that some prior art keeps also have four channels, two of the channels providing fully closed positions for a window and two of the channels providing partially closed positions. Those prior art keeps are not reversible, however, and two pairs of channels are provided solely to allow the locking members of a locking bar to engage the keep from either direction.

The keep 10 also has two fixing holes 34 which can accommodate screws or other fastenings by which the keep may be secured to the frame profile 16, in known fashion.

In this embodiment, the channels 26, 30 are symmetrical relative to the centre-line 36 of the keep. Accordingly, in this embodiment the fixing holes 34 and the

formations 12, 14 are not symmetrical relative to the centre-line 36. It will be understood that in another embodiment the fixing holes and formations could be symmetrical but the channels not symmetrical, or none of these components could be symmetrical, as desired.

As shown in Fig.4, the width w of the formations 12, 14 is the same, and whilst this is not essential it is desirable so that the formations 12, 14 lie in corresponding locations in both positions of the keep (as shown in Figs. 8 and 9). As shown in Fig.4, the spacing s1 between the centre-line of the first formation 12 and the centre-line of the first channel 26a, is different from the spacing s2 between the centre-line of the second formation 14 and the second channel 26b. By virtue of this difference in spacing, when the keep is reversed in position upon the frame (e.g. moving from the position of Fig.8 to the position of Fig.9), it adopts a different position relative to the frame. This results in the channels 26a,b and 30a,b being in a different position, and consequently the locked window being in a different position, relative to the frame.

As shown in Figs. 8 and 9, the sealing gap G1 for the gasket (not shown) when the keep is in its first position (Fig.8) differs from the sealing gap G2 when the keep is in its second position (Fig.9).

In this embodiment, the difference between the dimensions s1 and s2 is 1 mm, so that the difference between the gaps G1 and G2 is also 1 mm. Other differences in spacing could clearly be used if desired, but it is believed that a 1 mm adjustment in position of the window relative to the frame is sufficient for the vast majority of cases. Also, finer adjustment is not likely to be required.

For this particular keep 10, frame profile 16 and window profile 40 the gaps G1 and G2 are 3mm and 4mm respectively, and these dimensions are marked onto the keep for ease of reference by the installer.

It will be seen from Fig. 4 in particular that the keep 10 is tapered to both sides of the centre-line 36, so that the keep will not foul the window during closing and opening movement in either of the available keep positions, even if the window is hinged upon friction stays.

The keep will typically be designed for use in one of the available positions, for

example the position shown in Fig.8 with the sealing gap G1 set at 3 mm. However, the installer has the option to reverse the keeper so as to increase the sealing gap to 4mm, in the event that the window manufacturer changes the gasket material to a harder compound, or if the gasket is pre-extruded with the profile and in some cases is caused to harden during the assembly process.

CLAIMS

1. A keep for use in securing a movable panel relative to its frame, the keep having a first channel and a second channel respectively defining a fully-closed and partially-closed position of the panel in use, the keep having a first formation and a second formation, the formations being adapted to engage the frame and define the position of the keep relative to the profile of the frame, in which the keep is reversible and the first channel is spaced from the first formation by a distance which is different to the spacing of the second channel from the second formation.

2. A keep according to Claim 1 in which the difference in spacing between the first channel and the first formation, and the second channel and the second formation, is less than 2 mm.

3. A keep according to Claim 2 in which the difference in spacing between the first channel and the first formation, and the second channel and the second formation, is 1 mm.

4. A keep according to any one of Claims 1-3 in which the keep has four channels arranged in two pairs.

5. A keep according to Claim 4 in which the channels are symmetrically located in the keep.

6. A keep according to Claim 4 or Claim 5 in which the location and/or size of the formations are not symmetrical.

7. A keep according to any of Claims 1-6 in which the top surface of the keep is tapered to both front and back.

8. A keep according to Claim 7 in which the length and angle of the tapers is symmetrical.

9. A keep constructed and arranged substantially as described in relation to Figs. 3-9 of the accompanying drawings.

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Application No:	GB0605645.1	**Examiner:**	Mr Nick Smith
Claims searched:	1-9	**Date of search:**	26 June 2006

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-6	GB 2304784 A (WMS) See Figs. and page 5, lines 19-34
X	1-6	GB 2246807 A (WMS) See in particular Fig. 1b
	-	GB 2241531 A (SECURISTYLE)
	-	GB 2296740 A (FURNEX)

Categories:

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

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

E2A

Worldwide search of patent documents classified in the following areas of the IPC

E05B; E05C

The following online and other databases have been used in the preparation of this search report

Online: EPODOC, WPI