

Description

My present invention comprises a friction pivot joint, of a type particularly suitable for use as a friction pivot joint in a window stay.

Such friction pivot joints as are described in, for example, New Zealand Patent specification Nos. NZ-A-144922/146130/146886, NZ-A-162919 and NZ-A-196479 are typically employed to friction movably couple two arms of a window stay, or an arm of a stay and a frame or sash plate, and comprise a rivet which extends through two apertures formed one in each of the adjacent ends of the arms to be joined and a bushing formed of a self-lubricating material such as nylon or a suitable plastics material, interposed therebetween to prevent metal to metal contact in the joint between moving parts of the arms and rivet. When such joints are provided in window stays it is important that the joint be accurately formed and the rivet, which holds the joint together and applies the friction providing pressure thereto, properly centered. If the rivet is off-center and/or "leaned" to one side during manufacture for example, the joint will be inaccurately formed and the arms will not extend in the same plane. Any misalignment at the joint is magnified at the distal ends of the arms and thus it is important that such joints are so constructed as to minimise such difficulties. One form of such joint is also described in GB-A-2094880.

An improved form of such a friction pivot joint is known from EP-A-0 106 693 wherein the joining rivet is eliminated. Instead, material of a first component is deformed to project through an aperture formed in a second component so that a "turret" of material is provided on the first component, which turret extends through the aperture in the second component. In the formed joint a self-lubricating bushing is interposed between the turret of the first component and the second component and the turret is crimped down to form a permanent joint. This form of bearing is conveniently referred to as an integral bearing. In order that sufficient material is present in the component in which the turret is formed, to enable the turret to be formed by deformation thereof, it is necessary that this component be of a substantial thickness and this, rather than the strength of the component required, is a limiting factor on the thickness of the component provided. It is typically necessary to provide a significantly thicker component than would otherwise be required simply to provide the required strength alone.

There is thus known from EP-A-0 106 693 a friction pivot joint between two components such as two arms, or an arm and a frame or sash plate, of a window stay, said joint comprising an aperture in a first of the components, an annular shoulder surrounding and projecting from the periphery of said aperture, an aperture in said second component the annular shoulder extending into the aperture from one side of the second component thus locating said second component

about said shoulder, and a bushing of a self-lubricating and wear-resistant material interposed between said shoulder and said second component to prevent direct contact therebetween.

I have discovered a solution to the problem of providing a joint having the advantages of the joint of EP-A-0 106 693, without having to provide components of significant thickness, and my invention is characterised by providing a separate fixing means for connecting the two components of the joint and applying friction-creating pressure thereto, said separate fixing means extending into the joint from the other side of the second component and engaging with said shoulder.

Preferably the said shoulder is formed by the deformation or displacement of material from the relevant component. The shoulder may however comprise a separately formed and subsequently fitted insert.

It is preferred that the said fixing means comprise a body portion which may be of a generally cylindrical formation and a top portion which may be of a generally peripheral flange like formation. In such a form the fixing means is conveniently termed a "button".

The pivot joint of the invention may be friction adjustable so that the friction creating pressure within the joint may be varied. It may be desired to adjust the friction of the joint to compensate for wear (if any) occurring in the joint components for example. An increase in friction may be achieved by compression of the fixing means to further close the joint.

Preferred forms of friction pivot joint of the invention are illustrated in the accompanying drawings, by way of example, wherein:—

Figure 1 is a cross-sectional view of a first preferred form of friction pivot joint, which does not comprise friction adjustment, with the components thereof being assembled together but prior to fixing of the joint;

Figure 2 is a cross-sectional view of the first preferred form of friction pivot joint of Figure 1 after fixing of the joint; and

Figure 3 is a cross-sectional view of a second preferred form of friction pivot joint which comprises friction adjustment.

In the preferred forms of joint illustrated, a portion of a first component such as a frame or sash plate or the end of a first arm is indicated at 1. A second component such as an arm is indicated at 2. An aperture is formed in the first of the components 1, and an annular shoulder 3 surrounds and projects from the periphery of the aperture as shown. In the preferred forms of joint the annular shoulder 3 is formed by displacement of arm material in the forming of the aperture in the component 1, and the shoulder 3 may thus be referred to as a displacement. An aperture is formed in the second component 2 whereby the second component is located about the shoulder 3. A bushing or sleeve 4 is interposed between the components 1 and 2, so that there is no direct or

metal to metal contact therebetween. The bushing 4 is formed of a suitable self-lubricating and wear-resistant material such as nylon or other suitable plastics material. A "fixing means" for fixing the joint extends through the joint and is fixed beneath the shoulder 3 to fix the joint and apply friction creating pressure thereto. The said fixing means 5, referred to as a button, comprises top portion 5a extending generally radially and of a peripheral flange like formation which extends over the second component 2 via the bushing 4 as shown, and a body portion 5b of a generally cylindrical formation which extends through the joint and the shoulder or displacement and which is engaged beneath the shoulder 3 by crimping or the like from the position shown in Figure 1 to that shown in Figure 2. The body portion 5b of the button preferably comprises an enlarged lower peripheral rim part 5c which is engaged beneath the shoulder 3. The engagement of the button 5 into the joint and crimping of the rim portion 5c thereof is so effected as to cause friction creating pressure to be applied to the joint to the extent desired.

The preferred forms of joint described may be assembled with relative ease while still maintaining the required degree of precision and in particular of accurate centering of the joint. The connected components such as arms are located and centered to one another by virtue of the shoulder 3. The button 5 is suitably inserted by way of a pin extending through the center of the button to effect centering thereof. It is not possible for the button to "lean" during manufacture or the like so that problems with centering are substantially eliminated. As the shoulder 3 need not be of a large dimension height-wise it may be integrally formed from arms of a lesser thickness by deformation of arm material. The amount of arm material required for such deformation is not a limiting factor on the thickness of the arm required. With the integral bearing of EP-A-0 106 693 it is typically necessary to provide a significantly thicker arm than would otherwise be required simply to provide the required strength alone, for this purpose. In manufacture of the joint it is preferred that the bushing be insert moulded onto the component 2.

The second preferred form of joint shown in Figure 3 is friction adjustable and includes one form of friction adjustment. A friction adjustment cap indicated at 10 is interposed between the fixing means or button 5 and a threaded fastener such as a screw, a part of which is shown in phantom outline. The friction adjustment cap includes a peripheral rim portion 10a which extends over the peripheral edge of the top portion 5a of the fixing button 5 and which is shaped as shown. The cap 10 may also include a locating portion 10b which extends into the hollow interior of the fixing button 5 as shown, in a moderate friction fit. The bushing 4 may in this form of joint include an annular enlargement 4a as generally shown. If the friction joint is mounted to a window frame and sash the screw fastener

may be a fixing screw whereby the stay is secured to the frame or sash which is screwed thereinto. If adjustment of the friction of the joint is required the screw fastener can be tightened such that the friction adjustment cap 10 will be forced down onto the fixing button 5 so that further friction providing pressure will be applied to the bushing 4 and the joint generally. The peripheral rim portion 10c of the friction adjustment cap 10 on the shoulder 4a of the bushing 4 will act to prevent bushing material from "escaping" from the joint.

In a variation of the second preferred form of joint the screw fastener enabling friction adjustment of the joint may be threaded into threads provided on the side walls of the aperture in the component 1.

The friction adjustment cap 10 does not add significant extra bulk to the joint. In a joint having a total depth or height of 5 mm for example only 1 mm extra is added.

The foregoing describes my invention including preferred embodiments thereof.

Claims

1. A friction pivot joint between two components such as two arms, or an arm and a frame of sash plate, of a window stay, said joint comprising an aperture in a first of the components (1), an annular shoulder (3) surrounding and projecting from the periphery of said aperture, an aperture in said second component (2) the annular shoulder (3) extending into the aperture in said second component from one side of the second component (2) thus locating said second component about said shoulder (3), and a bushing (4) of a self-lubricating and wear-resistant material interposed between said shoulder (3) and said second component (2) to prevent direct contact therebetween, characterised by a separate fixing means (5) for connecting the two components (1, 2) of the joint and applying friction-creating pressure thereto, said separate fixing means (5) extending into the joint from the other side of the second component and engaging with said shoulder (3).

2. A friction pivot joint as claimed in Claim 1, wherein the said fixing means (5) comprises a body portion (5b) engaging said shoulder (3) in said aperture and a top portion (6a) extending generally radially from the upper part of the said body portion (5b) over said second component (2).

3. A friction pivot joint as claimed in Claim 2, wherein the said body portion (5b) of said fixing means (5) is of a generally cylindrical formation and the said top portion (5a) is of a generally peripheral flange like formation.

4. A friction pivot joint as claimed in either of Claims 2 and 3, wherein the said bushing (4) extends between the first and second components (1, 2), the internal surface of said aperture in said second component (1) and the external surface of said shoulder (3), and said second

metal to metal contact therebetween. The bushing 4 is formed of a suitable self-lubricating and wear-resistant material such as nylon or other suitable plastics material. A "fixing means" for fixing the joint extends through the joint and is fixed beneath the shoulder 3 to fix the joint and apply friction creating pressure thereto. The said fixing means 5, referred to as a button, comprises top portion 5a extending generally radially and of a peripheral flange like formation which extends over the second component 2 via the bushing 4 as shown, and a body portion 5b of a generally cylindrical formation which extends through the joint and the shoulder or displacement and which is engaged beneath the shoulder 3 by crimping or the like from the position shown in Figure 1 to that shown in Figure 2. The body portion 5b of the button preferably comprises an enlarged lower peripheral rim part 5c which is engaged beneath the shoulder 3. The engagement of the button 5 into the joint and crimping of the rim portion 5c thereof is so effected as to cause friction creating pressure to be applied to the joint to the extent desired.

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The second preferred form of joint shown in Figure 3 is friction adjustable and includes one form of friction adjustment. A friction adjustment cap indicated at 10 is interposed between the fixing means or button 5 and a threaded fastener such as a screw, a part of which is shown in phantom outline. The friction adjustment cap includes a peripheral rim portion 10a which extends over the peripheral edge of the top portion 5a of the fixing button 5 and which is shaped as shown. The cap 10 may also include a locating portion 10b which extends into the hollow interior of the fixing button 5 as shown, in a moderate friction fit. The bushing 4 may in this form of joint include an annular enlargement 4a as generally shown. If the friction joint is mounted to a window frame and sash the screw fastener

may be a fixing screw whereby the stay is secured to the frame or sash which is screwed thereinto. If adjustment of the friction of the joint is required the screw fastener can be tightened such that the friction adjustment cap 10 will be forced down onto the fixing button 5 so that further friction providing pressure will be applied to the bushing 4 and the joint generally. The peripheral rim portion 10c of the friction adjustment cap 10 on the shoulder 4a of the bushing 4 will act to prevent bushing material from "escaping" from the joint.

In a variation of the second preferred form of joint the screw fastener enabling friction adjustment of the joint may be threaded into threads provided on the side walls of the aperture in the component 1.

The friction adjustment cap 10 does not add significant extra bulk to the joint. In a joint having a total depth or height of 5 mm for example only 1 mm extra is added.

The foregoing describes my invention including preferred embodiments thereof.

Claims

1. A friction pivot joint between two components such as two arms, or an arm and a frame of sash plate, of a window stay, said joint comprising an aperture in a first of the components (1), an annular shoulder (3) surrounding and projecting from the periphery of said aperture, an aperture in said second component (2) the annular shoulder (3) extending into the aperture in said second component from one side of the second component (2) thus locating said second component about said shoulder (3), and a bushing (4) of a self-lubricating and wear-resistant material interposed between said shoulder (3) and said second component (2) to prevent direct contact therebetween, characterised by a separate fixing means (5) for connecting the two components (1, 2) of the joint and applying friction-creating pressure thereto, said separate fixing means (5) extending into the joint from the other side of the second component and engaging with said shoulder (3).

2. A friction pivot joint as claimed in Claim 1, wherein the said fixing means (5) comprises a body portion (5b) engaging said shoulder (3) in said aperture and a top portion (6a) extending generally radially from the upper part of the said body portion (5b) over said second component (2).

3. A friction pivot joint as claimed in Claim 2, wherein the said body portion (5b) of said fixing means (5) is of a generally cylindrical formation and the said top portion (5a) is of a generally peripheral flange like formation.

4. A friction pivot joint as claimed in either of Claims 2 and 3, wherein the said bushing (4) extends between the first and second components (1, 2), the internal surface of said aperture in said second component (1) and the external surface of said shoulder (3), and said second



component (2) and said fixing means top portion (5a), the bushing thus having a generally U-shaped cross-section.

5. A friction pivot joint as claimed in any one of Claims 2 to 4, wherein the said body portion (5b) of said fixing means (5) comprises an enlarged lower peripheral rim part (5c) and wherein said fixing means (5) is fixed by engagement of said lower peripheral rim part (5c) with said shoulder (3).

6. A friction pivot joint as claimed in any one of the preceding Claims, wherein said joint is friction adjustable the arrangement being such that an increase in friction is achieved by compression of said fixing means (5) to further close the joint.

7. A friction pivot joint as claimed in Claim 6, wherein the said fixing means comprises a hollow interior and wherein the joint comprises a threaded fastener adapted to extend through same and be anchored therein or therebeneath whereby friction adjustment of the joint may be effected by screw tightening of the said threaded fastener.

8. A friction pivot joint as claimed in Claim 7, including a friction adjustment cap (10) interposed between said fixing means (5) and said threaded fastener and including a peripheral rim portion (10a) extending over the peripheral edge of the top portion (5a) of said fixing means (5) to assist in containing material of said bushing (4) during tightening of said threaded fastener.

9. A friction pivot joint as claimed in Claim 8, wherein said friction adjustment cap (10) comprises a locating portion (10b) extending into the hollow interior of said fixing means (5) and wherein said peripheral rim portion (10a) thereof is of a general flange like formation.

10. A window stay incorporating one or more friction pivot joints as claimed in any one of the preceding Claims.

Patentansprüche

1. Ein Reibungsgelenk zwischen zwei Bestandteilen, wie zwei Armen oder von einem Arm und einem Rahmen oder von einem Rahmenteil eines Schiebefensters, einer Fensterstange, wobei das genannte Gelenk ein Loch in einem ersten Bestandteil (1) aufweist, eine ringförmige das genannte Loch umgebende und vom Umfang des Loches vorstehende Schulter (3) besitzt, und ein Loch in dem genannten zweiten Bestandteil (2) aufweist, wobei die genannte ringförmige Schulter (3) von einer Seite des zweiten Bestandteils (2) in das Loch des genannten zweiten Bestandteils (2) ragt und so den genannten zweiten Bestandteil (2) um die genannten Schulter (3) örtlich festlegt, und eine Hülse (4) enthält, die aus selbstschmierendem und verschleißfestem Material besteht, und zwischen der genannten Schulter (3) und den genannten zweiten Bestandteil (2) eingefügt ist, um direkten Kontakt dazwischen zu verhindern, gekennzeichnet durch einen separaten Befestigungsteil (5) zur Verbindung der beiden Bestandteile (1, 2) des Gelenks und zum Aufbringen von

reibungerzeugendem Druck auf diese, wobei der genannte separate Befestigungsteil (5) von der anderen Seite des zweiten Bestandteils (2) her in das Gelenk ragt und die genannte Schulter (3) berührt.

2. Ein Reibungsgelenk nach Anspruch 1, dadurch gekennzeichnet, daß der genannte Befestigungsteil (5) ein Körperteilstück (5b) enthält, welches die genannte Schulter (3) in dem genannten Loch berührt und ein Deckelteilstück (5a) enthält, welches sich im allgemeinen radial vom oberen Bestandteil des Körperteilstücks (5b) über den zweiten Bestandteil (2) erstreckt.

3. Ein Reibungsgelenk nach Anspruch 2, dadurch gekennzeichnet, daß das genannte Körperteilstück (5b) des genannten Befestigungsteils (5) von einer im allgemeinen zylindrischen Form ist und das genannte Deckelteilstück (5a) im allgemeinen von außenflanschähnlicher Gestalt ist.

4. Ein Reibungsgelenk nach Anspruch 2 oder 3, dadurch gekennzeichnet, daß die genannte Hülse (4) sich zwischen dem ersten und dem zweiten Bestandteil (1, 2) des Gelenkes, die innere Oberfläche des genannten Loches im genannten zweiten Bestandteil (2) und die äußere Oberfläche der genannten Schulter (3), und den genannten zweiten Bestandteil (2) und das genannte Deckelteilstück (5a) des Befestigungsteils (5) erstreckt und derart die Hülse (4) einen im wesentlichen U-förmigen Querschnitt bildet.

5. Ein Reibungsgelenk nach irgendeinem der Ansprüche 2 bis 4, dadurch gekennzeichnet, daß das genannte Körperteilstück (5b) des genannten Befestigungsteils (5) einen vorgrößerten unteren Umfangsrandteil (5c) enthält, und worin der genannte Befestigungsteil (5) durch Überdeckung des unteren Umfangsrandteils (5c) an der genannten Schulter (3) befestigt ist.

6. Ein Reibungsgelenk nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Gelenk bezüglich der Reibung einstellbar ist, wobei die Anordnung so ist, daß eine Erhöhung der Reibungskraft durch Zusammenpressen des genannten Befestigungsteils (5), um das Gelenk weiter zusammenzuschließen, erreicht wird.

7. Ein Reibungsgelenk nach Anspruch 6, dadurch gekennzeichnet, daß der genannte Befestigungsteil einen inneren Hohlraum hat, und in welchem das Gelenk ein mit Gewinde versehenes Befestigungselement enthält, welches durch dasselbe hindurchgehen kann und darin oder darunter verankert ist, wobei die Reibungseinstellung des Gelenks durch Festschrauben des genannten mit Gewinde versehenen Befestigungselements bewirkt werden kann.

8. Ein Reibungsgelenk nach Anspruch 7, dadurch gekennzeichnet, daß es eine Reibungseinstellungskappe (10) enthält, die zwischen dem genannten Befestigungsteil (5) und das genannte mit Gewinde versehene Befestigungselement eingefügt ist und einschließlich einem Umfangsrandteil (10a) über die äußere Kante des Deckelteilstücks (5a) des genannten Befestigungsteils (5)



ragt, um während des Festziehen des mit Gewinde versehenen Befestigungselements dadurch mitwirkt, daß es Material der genannten Hülse (4) umfaßt.

9. Ein Reibungsgelenk nach Anspruch 8, dadurch gekennzeichnet, daß die genannte Reibungseinstellungskappe (10), ein die Position bestimmendes Bestandteil (10b) besitzt, welches in den inneren Hohlraum des genannten Befestigungsteils (5) hineinragt und dessen genannter Umfangsrandteil (10a) von einer im allgemeinen flanschförmigen Gestalt ist.

10. Eine Fensterstange, dadurch gekennzeichnet, daß sie eine oder mehrere der Reibungsgelenke nach einem der vorstehenden Ansprüche enthält.

Revendications

1. Joint à pivot de friction entre deux éléments constitutifs tels que deux bras ou un bras et une plaque de dormant ou de châssis d'une ferrure de fenêtre, ledit joint comprenant une ouverture dans un premier (1) des éléments constitutifs, un épaulement annulaire (3) entourant le pourtour de ladite ouverture et dépassant de celui-ci, une ouverture dans le deuxième élément constitutif (2), l'épaulement annulaire (3) s'étendant à partir d'un côté du deuxième élément constitutif (2) et dans l'ouverture pratiquée dans celui-ci de façon à positionner ledit deuxième élément constitutif autour dudit épaulement (3), et un coussinet (4) fait d'une matière auto-lubrifiante et résistant à l'usure, intercalé entre ledit épaulement (3) et ledit deuxième élément constitutif (2) pour éviter un contact direct entre ceux-ci, caractérisé par un moyen de fixation séparé (5) pour relier les deux éléments constitutifs (1, 2) du joint et pour y appliquer une pression engendrant une friction, ledit moyen de fixation séparé (5) s'étendant dans le joint à partir de l'autre côté du deuxième élément constitutif et étant en prise avec ledit épaulement (3).

2. Joint à pivot de friction selon la revendication 1, dans lequel ledit moyen de fixation (5) comprend un corps (5b) en prise avec ledit épaulement (3) dans ladite ouverture et une tête (5a) s'étendant d'une façon générale radialement à partir de la partie supérieure dudit corps (5b) et au-dessus dudit deuxième élément constitutif (2).

3. Joint à pivot de friction selon la revendication 2, dans lequel ledit corps (5b) dudit moyen de fixation (5) a une forme générale cylindrique et

ladite tête (5a), une forme générale en collet périphérique.

4. Joint à pivot de friction selon la revendication 2 ou 3, dans lequel ledit coussinet (4) s'étend entre les premier et deuxième éléments constitutifs (1, 2), entre la surface interne de ladite ouverture dudit deuxième élément constitutif (2) et la surface externe dudit épaulement (3) et entre ledit deuxième élément constitutif (2) et ladite tête (5a) du moyen de fixation, le coussinet ayant ainsi, d'une façon générale, une section transversale en U.

5. Joint à pivot de friction selon l'une quelconque des revendications 2 à 4, dans lequel ledit corps (5b) dudit moyen de fixation (5) comprend un bourrelet élargi (5c), périphérique et inférieur, et dans lequel ledit moyen de fixation (5) est fixé par la prise dudit bourrelet périphérique inférieur (5c) avec ledit épaulement (3).

6. Joint à pivot de friction selon l'une quelconque des revendications précédentes, dans lequel ledit joint est réglable en friction, l'ensemble étant tel qu'une augmentation de la friction est obtenue par compression dudit moyen de fixation (5) dans le sens d'un serrage accru du joint.

7. Joint à pivot de friction selon la revendication 6, dans lequel ledit moyen de fixation comprend une cavité intérieure et dans lequel le joint comprend une pièce de fixation filetée conçue pour pouvoir s'étendre dans cette cavité et venir en prise dans celle-ci ou derrière celle-ci, ce grâce à quoi le réglage en friction du joint peut être effectué par vissage de la pièce de fixation filetée.

8. Joint à pivot de friction selon la revendication 7, comprenant un chapeau de réglage en friction (10) intercalé entre ledit moyen de fixation (5) et ladite pièce de fixation filetée et comprenant un bourrelet périphérique (10a) s'étendant au-dessus du bord périphérique de la tête (5a) dudit moyen de fixation (5) pour contribuer au logement de la matière constituant ledit coussinet (4) lors du serrage de ladite pièce de fixation filetée.

9. Joint à pivot de friction selon la revendication 8, dans lequel ledit chapeau de réglage en friction (10) comprend une partie de positionnement (10b) s'étendant dans la cavité intérieure dudit moyen de fixation (5) et dans lequel ledit bourrelet périphérique (10a) de celui-ci a une forme générale en collet.

10. Ferrure de fenêtre comportant un ou plusieurs joints à pivot de friction selon l'une quelconque des revendications précédentes.

