

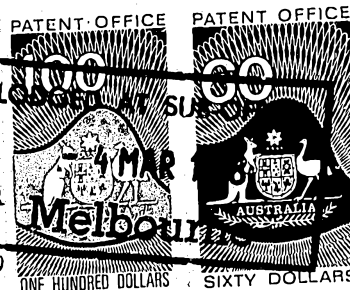
(CONVENTION. By one or more persons and/or a Company)

COMMONWEALTH OF AUSTRALIA

Patents Act 1952-1969

CONVENTION APPLICATION FOR A PATENT

59 6278



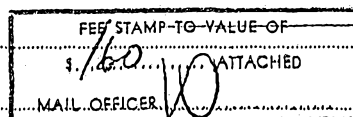
LODGED AT SUB-OFFICE
- 4 MAR 1988
Melbourne

12634/88

(1) Here insert (in full) Name or Names of Applicant or Applicants, followed by Address (es).

xx (1) TRICO-FOLBERTH LIMITED
We

OF Great West Road, Brentford, Middlesex TW8 9HP,
England



(2) Here insert Title of Invention.

hereby apply for the grant of a Patent for an invention entitled: (2)

PIVOT JOINT

APPLICATION ACCEPTED AND AMENDMENTS

ALLOWED 14-2-90

(3) Here insert number(s) of basic application(s)

which is described in the accompanying complete specification. This application is a Convention application and is based on the application numbered (3)
8705033

(4) Here insert Name of basic Country or Countries, and basic date or dates

for a patent or similar protection made in (4) United Kingdom
on 4th March 1987

xxx
Our address for service is Messrs. Edwd. Waters & Sons, Patent Attorneys,
50 Queen Street, Melbourne, Victoria, Australia.

DATED this 2nd day of March 1988

(5) Signature (s) of Applicant (s) or Seal of Company and Signatures of its Officers as prescribed by its Articles of Association.

(5) TRICO-FOLBERTH LIMITED

by [Signature]
Stephen K. Plymin

Registered Patent Attorney

To:

P82/0174

COMMONWEALTH OF AUSTRALIA

Patents Act 1952-1969

**DECLARATION IN SUPPORT OF A CONVENTION
APPLICATION FOR A PATENT OR PATENT OF ADDITION**

(1) Here
insert (in
full) Name of
Company.

In support of the Convention Application made by⁽¹⁾.....
TRICO-FOLBERTH LIMITED

(2) Here
insert title
of Invention.

(hereinafter referred to as the applicant) for a Patent

for an invention entitled:⁽²⁾.....

PIVOT JOINT

(3) Here
insert full Name
and Address,
of Company
official
authorized
to make
declaration.

I,⁽³⁾ LAURENCE JOHN DYSON
of 50 Queen Street, Melbourne, Victoria, Australia

do solemnly and sincerely declare as follows:

1. I am authorised by the applicant for the patent
to make this declaration on its behalf.

2. The basic application as defined by Section 141 of the Act was
made in⁽⁴⁾ United Kingdom

on the 4th day of March 1987, by

TRICO-FOLBERTH LIMITED

on the XXXXX day of XXXXX XXXXXXXX

(4) Here
insert basic
Country or
Countries
followed by
date or dates
and basic
Applicant or
Applicants.

(5) Here
insert (in
full) Name
and Address
of Actual
Inventor or
Inventors.

3.⁽⁵⁾ IVAN ALFRED DUCK "Chenies", Loudhams Wood Lane,
Chalfont St. Giles, Buckinghamshire, England and PETER
CECIL PETHERS, Villa Rosa, Lovel Road, Winkfield, Berkshire
England

is/are the actual inventors of the invention and the facts upon which the applicant
is entitled to make the application are as follow:

The applicant is the assignee of the said actual inventors

4. The basic application referred to in paragraph 2 of this Declaration
was.....the first application made in a Convention country in
respect of the invention the subject of the application.

DECLARED at Melbourne, Victoria, Australia
this 3rd day of March 19 88

(6) Signature.

(6)

(12) PATENT ABRIDGMENT (11) Document No. AU-B-12634/88
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 596278

(54) Title
PIVOT JOINT FOR WINDSCREEN WIPER

International Patent Classification(s)
(51)⁴ **F16C 011/04 B60S 001/38**

(21) Application No. : **12634/88**

(22) Application Date : **04.03.88**

(30) Priority Data

(31) Number (32) Date (33) Country
8705033 04.03.87 GB UNITED KINGDOM

(43) Publication Date : **08.09.88**

(44) Publication Date of Accepted Application : **26.04.90**

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(56) Prior Art Documents
AU 15322/88 F16C 11/04, B60S 1/38
AU 80871/87 F16C 11/04, B60S 1/32

(57) Claim

i. A pivot joint for pivoting together first and second members, at least the first of which is of channel section at the joint and the second of which is adapted to seat within the first, the pivot joint comprising a joint body of generally channel section adapted to sit within the first member and to receive the second member therewithin, the joint body having a pair of outwardly extending trunnions adapted to cooperate with apertures in the first member, aligned bores through said trunnions adapted to be aligned with aligned apertures in the second member, and a pin adapted to extend through the apertures of the members and through the bores of the trunnions of the joint body, the pin being retained in one of the bores of the joint body by means of one or more projections or recesses on the pin cooperating with a respective recesses or projections in the bore.

2. A pivot joint comprising first and second members to be pivotted together, the first member being of channel section at least at the joint and the second member being adapted to seat within the channel section of the first member; a joint body of generally channel section adapted to sit within the first member and to receive the second member within its channel section, the joint body having a pair of outwardly extending trunnions adapted to cooperate with apertures in the first member and aligned bores through said trunnions adapted to be aligned with aligned apertures in the second member; and a pivot pin adapted to extend through the apertures of the members and through the bores of the trunnions of the joint body, the pin being retained in one of the bores of the joint body by means of one or more projections or grooves on the pin cooperating with respective grooves or projections in the bore.

COMPLETE SPECIFICATION

(ORIGINAL)

Class

Int. Class

Application Number:

Lodged:

Complete Specification Lodged:

Accepted:

Published:

Priority :

Related Art :

59 6278

Name of Applicant : TRICO-FOLBERTH LIMITED

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50 QUEEN STREET, MELBOURNE, AUSTRALIA, 3000.

Complete Specification for the invention entitled:

PIVOT JOINT

The following statement is a full description of this invention, including the best method of performing it known to : US

PIVOT JOINT

This invention relates to a pivot joint which is particularly but not exclusively useful in the manufacture of windscreen wipers.

In the manufacture of windscreen wipers, a number of pivot joints are used, particularly between the various yokes and/or levers of the windscreen wiper blade.

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Problems exist in the manufacture of windscreen wipers due to the necessity, very often, of pivoting metal parts together. These joints tend to be noisy and have a tendency to suffer from wear and corrosion. Various proposals have been made for overcoming these problems, for example, by the provision of plastics members between the metal parts of the joints, but these have not proved entirely satisfactory from a manufacturing standpoint although they have worked satisfactorily in

20 use.

The present invention seeks to provide a new and improved pivot joint which is relatively inexpensive to manufacture and use and which overcomes or reduces some or all of the above problems.

According to the invention, there is provided a pivot joint for pivoting together first and second members, at least the first of which is of channel section at the joint and the second of which is adapted to seat within the first, the pivot joint comprising a joint body of generally channel section adapted to sit within the first member and to receive the second member therewithin, the joint body having a pair of outwardly extending trunnions adapted to cooperate with apertures in the first member, aligned bores through said

trunnions adapted to be aligned with aligned apertures in the second member, and a pin adapted to extend through the apertures of the members and through the bores of the trunnions of the joint body, the pin being
5 retained in one of the bores of the joint body by means of one or more projections or recesses on the pin cooperating with a respective recesses or projections in the bore.

10 Further according to the invention, there is provided a pivot joint comprising first and second members to be pivotted together, the first member being of channel section at least at the joint and the second member being adapted to seat within the channel section of the
15 first member; a joint body of generally channel section adapted to sit within the first member and to receive the second member within its channel section, the joint body having a pair of outwardly extending trunnions adapted to cooperate with apertures in the first member
20 and aligned bores through said trunnions adapted to be aligned with aligned apertures in the second member; and a pivot pin adapted to extend through the apertures of the members and through the bores of the trunnions of the joint body, the pin being retained in one of the
25 bores of the joint body by means of one or more projections or grooves on the pin cooperating with respective grooves or projections in the bore.

Preferably, a single projection is provided in the form
30 of an annular rib and the cooperating recess is an annular groove.

The pin may be formed with the projection or projections and the bore may be provided with the groove or grooves.

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Suitably, the members may be yokes of a windscreen wiper

blade harness. The first member may be the primary yoke and the second member may be the secondary yoke.

The invention will now be described in greater detail, 5 by way of example, with reference to the drawings, in which: -

Figure 1 is a perspective view of one form of pivot 10 joint in accordance with the invention as applied to the joint between primary and secondary yokes of a windscreen wiper blade harness;

Figure 2 is a perspective view of the joint body shown in figure 1;

15 Figure 3 is a sectional view of the joint taken on the line III-III of figure 1;

Figure 4 is a side view of the pin used in the pivot 20 joint of figures 1 to 3;

Figure 5 is a view similar to figure 4 but showing a different form of pin;

25 Figure 6 is a view similar to figure 3 but showing a form of the joint in which the pin is provided with an annular groove;

Figure 7 is a view similar to figure 4 but showing the 30 pin used in the joint shown in figure 6, and

Figure 8 is a view similar to figure 3 but showing a form of joint in which the pin is of stepped construction.

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Referring to figure 1 of the drawings, there is shown a

pivot joint 1 between one end of the primary yoke 2 of the harness of a windscreen wiper blade and the secondary yoke 3, the joint being completed by a joint body 5 lying mainly between the two yokes 2 and 3 and a pin 6 passing through both yokes 2 and 3 and the joint body 5. In the embodiment shown, it can be seen that the primary yoke is of generally channel section having one wall 7 which is inclined outwardly from the base 8 of the channel while the remaining wall 9 (figure 3) is at right angles to the channel base 8. The departure of the primary yoke 2 from the usual channel section is determined by the particular characteristics of the blade which form no part of the present invention per se. The secondary yoke 3 is of the usual channel section to one side of the joint but is of the same section as the primary yoke on the other side where it forms an extension of the shape of the main yoke 2. It will be seen that the dimensions of the secondary yoke 3 are such that, at the joint, it will sit within the channel of the primary yoke 2 with sufficient clearance to permit the interposition of the joint body 5.

The joint body 5 can be particularly seen from figures 2 and 3. It comprises a generally channel shaped plastics moulding and is shaped exteriorly to enable it to fit snugly inside the channel of the primary yoke 2. It has a shoulder 10 towards one end 11 against which the end 12 of the primary yoke sits and which provides a cover for the joint end, the outer contour of this end portion 11 being shaped to continue the exterior surface of the primary yoke 2 into, as nearly as possible, the exterior surface of the secondary yoke 3. The remaining portion 14 is of reduced dimensions in order to seat within the channel of the primary yoke 2 and exhibits a pair of trunnions 15 and 16 which, while they are generally aligned for a purpose to be described hereafter, are

inclined to each other so that, when assembled to the primary yoke 2, they will extend at right angles to the respective side walls 7 and 9 thereof. In this position, they pass into apertures 19 and 20 in the primary yoke 2 and their ends are preferably flush with the exterior surface of the primary yoke 2.

A bore 23 or 24 is formed in each of the trunnions 15 and 16 respectively, the bore 24 in the right hand trunnion 16 being coaxial with the trunnion 16 and the bore 23 in the left hand trunnion 15 being inclined to the axis of the trunnion 15 so as to be aligned with the other bore 24. These bores 23 and 24 are additionally aligned with a pair of apertures 25 and 26 in the side walls of the secondary yoke 3 which, when assembled, lies within the channel of the joint body 5. The bore 23 in the left hand trunnion 15 is formed with an annular groove 32.

The joint is completed by the pin 6, shown in figure 4 which may be of metal or plastics material. It is basically in the form of a plain cylindrical rod 30 with rounded ends 31 which has, towards one end, an annular projection or rib 28 whose position is intended to coincide with the position of the groove 32 in the bore 23 of the joint body 5.

The assembly of the pivot joint described above will now be considered: -

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The primary and secondary yokes 2 and 3 are formed with the appropriate apertures 19, 20, 25 and 26, the joint body 5 is moulded and the pin 6 is formed. The first step of the assembly is to push the joint body 5 into the channel of the primary yoke 2 using the enlarged part 11 as a guide. The joint body 5 is made of a

sufficiently resilient plastics material that, as the joint body 5 is pushed into the channel of the primary yoke 2, the sides of the joint body 5 will be forced towards each other to allow the trunnions 15 and 16 to pass into the channel. Once the joint body 5 has been pushed home, the sides will spring back again, introducing the trunnions 15 and 16 into the respective apertures 19 and 20 in the primary yoke 2.

10 Then the secondary yoke 3 is offered up into the channel of the joint body 5, in which it is a sufficiently loose fit to enable pivoting between the secondary yoke 3 and the joint body 5. At this point, the apertures 25 and 26 in the secondary yoke 3 will be in alignment with the 15 bores 23 and 24 in the trunnions 15 and 16 of the joint body 5 and the pin 6 can be pushed in. The pin 6 may need to be actually forced in to enable its rib 28 to pass through the bores 23 in the trunnions, but once the rib 28 in the pin 6 is in alignment with the groove 32, 20 the groove 32 will snap around the rib 28, locking the pin 6 in place and thus maintaining the joint.

It is to be observed that, with the arrangement shown, the secondary yoke 3 can pivot relative to the joint 25 body 5 which itself will remain stationary with the primary yoke 2.

Figure 5 shows a variation of the pin which can be used with the above described joint. In this case, the pin 40 30 has a head 41 and an annular rib 42 towards the end away from the head 41. With this type of pin, the trunnion on the appropriate side may be cut back or countersunk to receive the head but this is not essential.

35 Figure 6 shows a variation of the pivot joint shown in figures 1 to 3. In this form, the position of the rib 28

and annular groove 32 are reversed so that the groove 32 is formed on the pin 5 and the rib 28 is formed on the wall of the bore 23 of the joint body 5. This makes for a slightly weaker construction of the joint as a reduction in the diameter of the pin 6 is avoided. The pin 6 can be seen best from figure 7.

Figure 8 shows a further variation of the pivot joint shown in figures 1 to 3. In this case, the pin 50 used is of stepped formation between its ends, so that one part 52 is of larger diameter than the other part 53. Correspondingly, the bores 54 and 55 in the trunnions 15 and 16 are of different diameters. This makes for easier threading through of the pin 50 and can make for easier alignment. The annular groove 57 can in fact be arranged in either part of the pin 50 with appropriate positioning of the rib 28 or vice versa.

It will be appreciated that various modifications may be made to the above described embodiments without departing from the scope of the invention. For example, the trunnions could be of any other desired shape, such as oval or square since there is no need to enable any pivoting at this point. If desired, the shoulder 10 on the joint body could be omitted and aligned trunnions could be used, allowing the primary yoke to pivot relative to the joint body. Furthermore, in this latter case, the secondary yoke could then be maintained stationary with respect to the joint body by using a pin of non-circular cross section.

Where the rib is formed on the pin, this need not be continuous but could be formed as a number of radially extending lugs, for example two. These lugs could be produced by forming pairs of indentations in the pin in such a way that the material of the pin is forced out

between the indentations.

It is to be understood that while the invention has been described as applicable to a primary yoke with one side wall inclined, both walls could be inclined or both walls could be at right angles to the base of the channel.

While the invention has been described with particular reference to the harness of a windscreen wiper blade, it is to be understood that the invention is not limited to the windscreen wiper field but may also be applied to any situation in which a similar pivot joint is required.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

XXXXXXXXXX
CLAIMS

1. A pivot joint for pivoting together first and second members, at least the first of which is of channel section at the joint and the second of which is adapted to seat within the first, the pivot joint comprising a joint body of generally channel section adapted to sit within the first member and to receive the second member therewithin, the joint body having a pair of outwardly extending trunnions adapted to cooperate with apertures in the first member, aligned bores through said trunnions adapted to be aligned with aligned apertures in the second member, and a pin adapted to extend through the apertures of the members and through the bores of the trunnions of the joint body, the pin being retained in one of the bores of the joint body by means of one or more projections or recesses on the pin cooperating with a respective recesses or projections in the bore.

2. A pivot joint comprising first and second members to be pivotted together, the first member being of channel section at least at the joint and the second member being adapted to seat within the channel section of the first member; a joint body of generally channel section adapted to sit within the first member and to receive the second member within its channel section, the joint body having a pair of outwardly extending trunnions adapted to cooperate with apertures in the first member and aligned bores through said trunnions adapted to be aligned with aligned apertures in the second member; and a pivot pin adapted to extend through the apertures of the members and through the bores of the trunnions of the joint body, the pin being retained in one of the bores of the joint body by means of one or more projections or grooves on the pin cooperating with respective grooves or projections in the bore.

3. A pivot joint as claimed in claim 1 or 2, wherein a single projection is provided in the form of an annular rib and the cooperating recess is an annular groove.

4. A pivot joint as claimed in any one of claims 1 to 3, wherein the pin is formed with the projection or projections and the bore is provided with the groove or grooves.

5. A pivot joint as claimed in any one of claims 1 to 4, wherein the pin is of stepped construction, being of larger diameter at one end than the other.

6. A pivot joint as claimed in any one of claims 1 to 5, wherein the members are yokes of a windscreen wiper harness.

7. A pivot joint as claimed in claim 6, wherein the first member is the primary yoke of a windscreen wiper blade harness and the second member is the secondary yoke thereof.

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8. A pivot joint substantially as described herein with reference to the drawings.

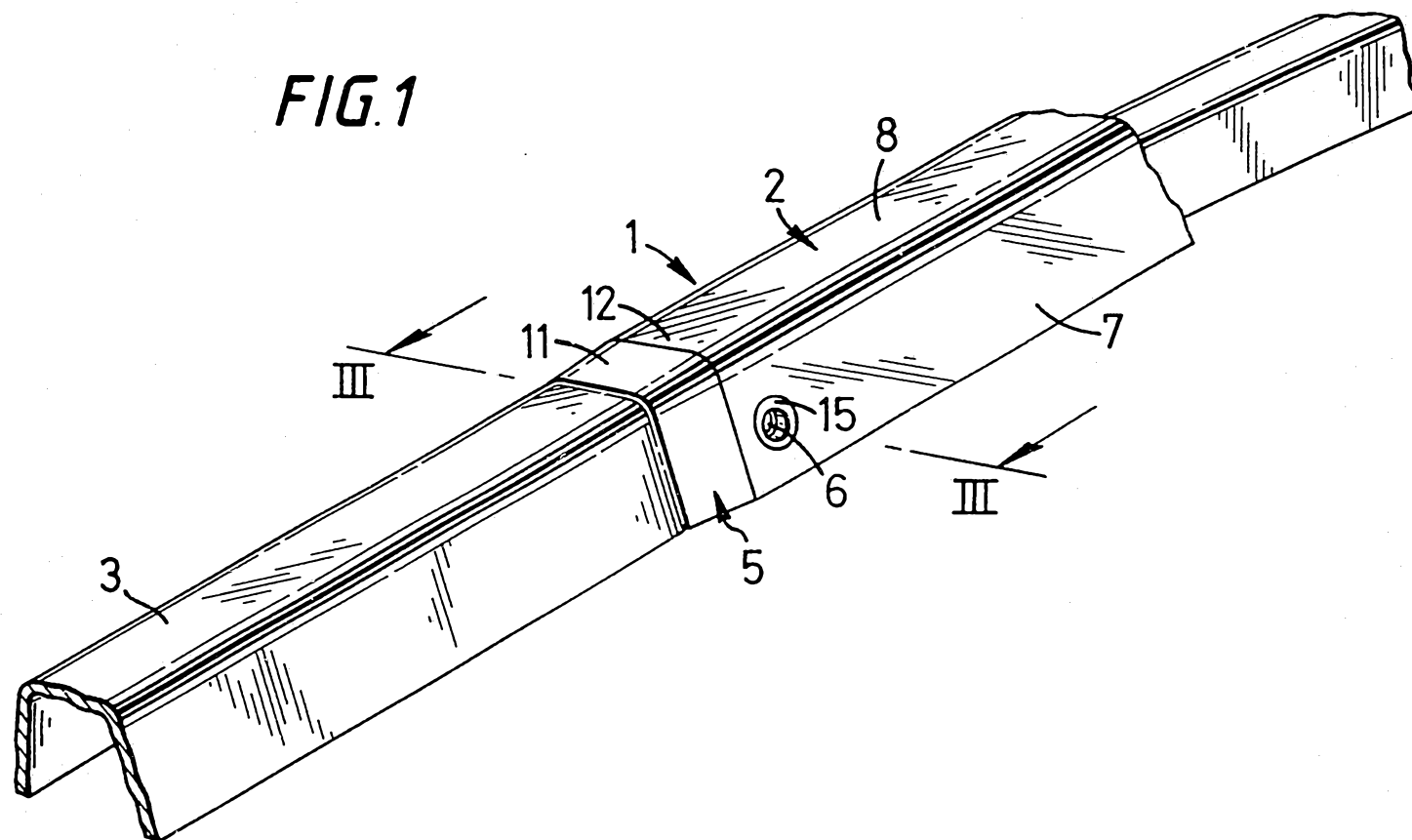
DATED this 3rd day of March 1988.

TRICO-FOLBERTH LIMITED

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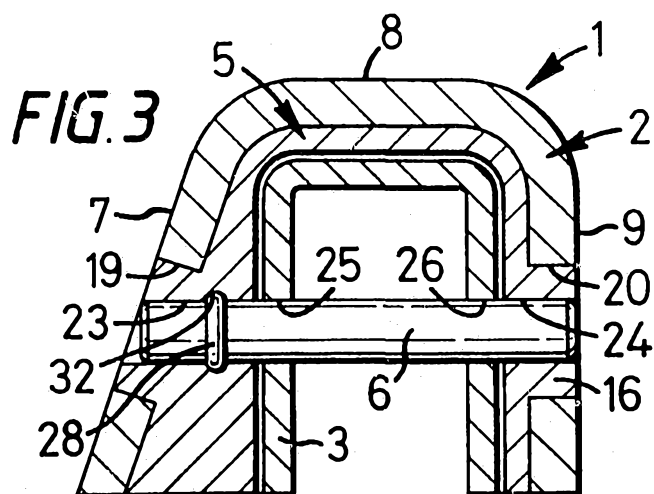
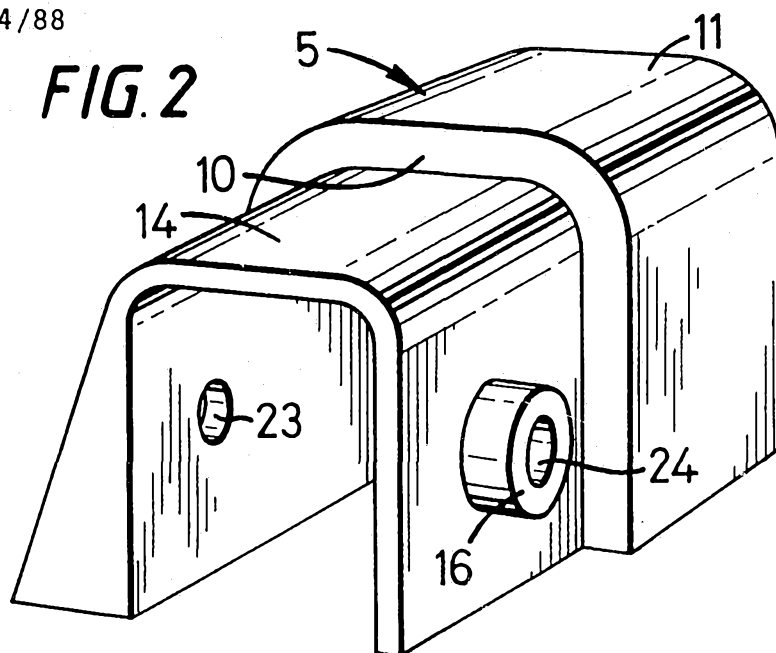
4 3 88 12634

FIG. 1



12 634/88

FIG. 3



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FIG. 4

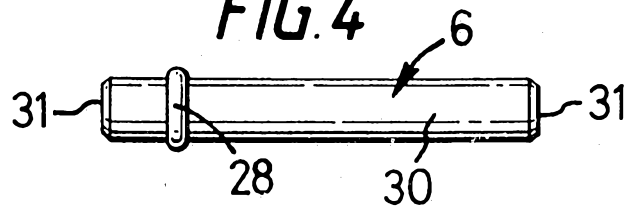


FIG. 5

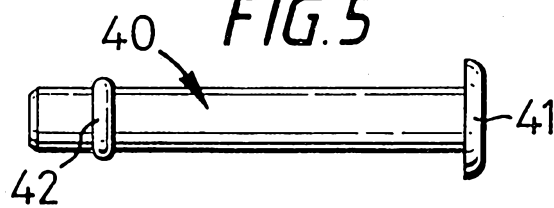


FIG. 6

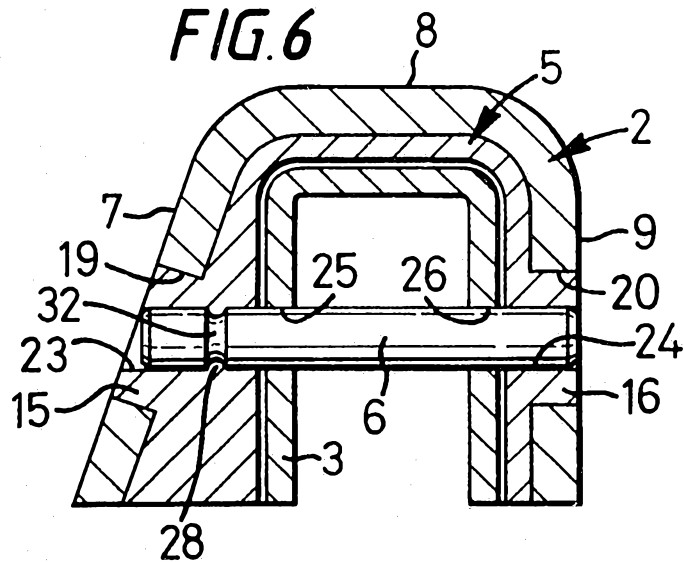


FIG. 7

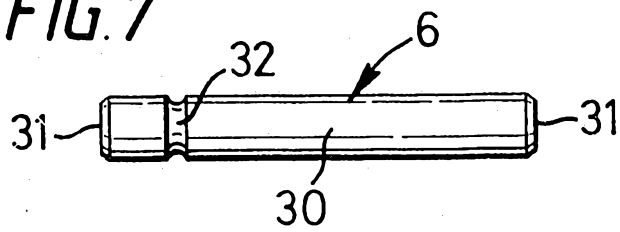


FIG. 8

