COMMONWEALTH of AUSTRALIA
PATENTS ACT 1952
APPLICATION FOR A STANDARD PATENT

We, AEPLC. of 
Cawston House, Cawston, 
Rugby, Warwickshire CV22 7SA, 
England.

hereby apply for the grant of a Standard Patent for an invention entitled:

"STRUCTURAL BEARING"

which is described in the accompanying provisional specification.

Details of basic application(s):

<table>
<thead>
<tr>
<th>Number</th>
<th>Convention Country</th>
<th>Date</th>
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<tr>
<td>850082?</td>
<td>Great Britain</td>
<td>14th January, 1985</td>
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LODED AT SUB-OFFICE
1 3 JAN 1986
Melbourne

The address for service is care of DAVIES & COLLISON, Patent Attorneys, of 1 Little Collins Street, Melbourne, in the State of Victoria, Commonwealth of Australia.

Dated this 13th day of January 1986

To: THE COMMISSIONER OF PATENTS

(a member of the firm of DAVIES & COLLISON for and on behalf of the Applicant)

Davies & Collison, Melbourne and Canberra.
DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT

In support of the Convention application made for a patent for an invention entitled: STRUCTURAL BEARING

1. DAVID G. HANTON

of

AEPLC, of Cawston House, Cawston, Rugby, Warwickshire CV22 7SA, ENGLAND

do solemnly and sincerely declare as follows:

1. I am the applicant for the patent

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 UNITED KINGDOM on the 14TH day of JANUARY 1985 by AEPLC

3. BAIGENT, Maurice George

of

The Hatchers, Hare Lane, Broadway, Ilminster, Somerset, United Kingdom

is the actual inventor of the invention and the facts upon which the applicant is entitled to make the application are as follows:

BY VIRTUE OF AN ASSIGNMENT DATED 12th January 1985 between the inventor and the applicant company.

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.

Except as stated in this paragraph, 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 CAWSTON this 10th day of January 1986

TO:

THE COMMISSIONER OF PATENTS.

(Signature of Declarant)

(IMPORTANT — Cross out inapplicable words in above Form.)
1. A structural bearing including a support comprising an elastomeric core having an integral outer reinforcing layer.

2. A structural bearing as claimed in Claim 1 in which the reinforcing layer includes wound fibres.

4. A structural bearing as claimed in Claim 2 or Claim 3 in which the wound fibres are of a material known by the trade mark KEVLAR.
Name of Applicant: AEPLC


Actual Inventor(s): Maurice George BAIGENT

Address for Service: DAVIES & COLLISON, Patent Attorneys, 1 Little Collins Street, Melbourne, 3000.

Complete Specification for the invention entitled:
"STRUCTURAL BEARING"

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

-1-
STRUCTURAL BEARING

The present invention relates to structural bearings, in particular, self-aligning supports for structural bearings.

One generally known self-aligning support is the so-called "Rubber Pot" bearing in which a rubber or elastomeric pad is enclosed and sealed within a cylinder or retaining ring. Under load, the rubber acts as a fluid to provide alignment. However, this construction tends to be rather expensive, requiring close tolerances in manufacture.

In another known construction an unrestrained and unenclosed elastomeric disc is attached between two plates. Resistance to horizontal loads is provided by a rod passing through the disc and located in the two plates. However, in such an unenclosed construction, the elastomeric pad requires to be quite hard in order to provide the necessary load-bearing capacity. This limits the rotational capacity available due to high moments of resistance which in turn create unduly high edge stresses on the interfaces.

It is an object of the present invention to provide a structural bearing support which is inexpensive and which is capable of a high load bearing capacity while at the same time offering a high rotational capacity.

It is a further object of the invention to provide a construction in which wear is minimised and in which sealing is not a problem.

According to the invention, a structural bearing includes a support comprising an elastomeric core
having an integral outer reinforcing layer.

Preferably, the reinforcing layer includes wound fibres or a wound cord which may be moulded in a similar elastomeric material to the core and preferably encloses the core. Preferably, the fibres are of a material known by the Trade Name KEVLAR, or carbon fibre or steel and are present as a spirally wound cord.

The elastomeric material may be any known synthetic material such as neoprene or polyethylene but is preferably a natural or synthetic rubber.

The support may simply be located between upper and lower plates and it is therefore not necessary to machine out accurately the centre of a retaining ring as is necessary in the case of the Pot bearing. Thus, there are no associated sealing problems.

Furthermore, since the reinforcement effectively restrains the tendency for the elastomer to bulge under load, rotational stiffness can be varied without affecting the load capacity, and the choice of elastomer need not be determined by its load capacity but possibly by some other property, for example resistance to chemical attack.

Finally, a support as described can be manufactured relatively cheaply, simply by winding a Kevlar cord coated with an elastomer around an elastomeric core. The elastomer can also be moulded between and/or around the Kevlar winding.

The invention may be carried into practice in various ways and some embodiments will now be described by way of example with reference to the accompanying drawings in which:
3.

Figure 1 is a schematic section through a support in accordance with the invention;

Figure 2 is a schematic section through one form of structural bearing using the support of Figure 1;

Figure 3 is a variation on the form shown in Figure 2; and

Figures 4 and 5 are views similar to Figure 2 showing two further embodiments of structural bearings.

As shown in Figure 1, a support 11 for a structural bearing comprises a core 12 of an elastomeric material such as natural rubber and a reinforcing outer layer 13 enclosing the core 12. The outer layer 13 is made up of a spirally wound cord 14 of Kevlar embedded in a matrix 15 of an elastomeric material which may or may not be the same as that of the core 12.

Figure 2 shows a free structural bearing 21 in which a support 11 is fixed beneath a centre plate 22 having a bearing layer 23 of for example polytetrafluoroethylene (PTFE). Above the centre plate there is a sliding plate 24 having a contact surface 25 of for example stainless steel co-operating with the bearing surface 23. The centre plate 22 has a downturned peripheral shoulder 26 which encloses the support 11, however, in the variation shown in Figure 3, the core 11 is flush with the peripheral edge 36 of the centre plate 32 and is bonded to it.

Figure 4 shows a guided structural bearing 41 in which the support 11 is fixed beneath a centre plate 42 having a bearing layer 43 co-operating with the contact surface 45 of a sliding plate 44. However,
in this case, the centre plate 42 has a central guide 47 which is located in a corresponding recess 48 in the sliding plate 44, providing a sliding key. Furthermore, horizontal movement is restrained by an outer wall 49 (or restraining ring) which encloses the support 11 and the centre plate 42.

Figure 5 shows a fixed structural bearing 51 in which the support 11 is fixed directly to the underside of a structural support member 52. The support member is guided for vertical movement by an outer wall 53 and all sliding movements are prevented.

In Figures 4 and 5 the wall 49, 53 may be replaced by a dowel or shear pin 61 extending through the support 11 into a corresponding recess 62 in the centre plate 42 or the support member 52, as a free fit. Also, in these two embodiments, the support 11 and walls 49, 53 may be fixed directly to the substructure or there may be a sheet located immediately above the substructure to prevent concrete etc. entering working parts of the bearing.
CLAIMS
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A structural bearing including a support comprising an elastomeric core having an integral outer reinforcing layer.

2. A structural bearing as claimed in Claim 1 in which the reinforcing layer includes wound fibres.

3. A structural bearing as claimed in Claim 2 in which the wound fibres are moulded in a similar elastomeric material to the core.

4. A structural bearing as claimed in Claim 2 or Claim 3 in which the wound fibres are of a material known by the trade mark KEVLAR.

5. A structural bearing as claimed in any of Claims 2 to 4 in which the fibres are present as a spirally wound cord.

6. A structural bearing as claimed in any preceding claim in which the elastomeric material is neoprene of polyethylene.

7. A structural bearing as claimed in any preceding claim in which the support is located between upper and lower plates.

8. A structural bearing constructed and arranged substantially as herein specifically described with reference to and as shown in any one of the accompanying drawings.
9. A method of manufacturing a support for a structural bearing which comprises forming an elastomeric core, coating a cord of KEVLAR material with an elastomeric material, and subsequently winding the cord to the core.

10. The steps or features disclosed herein or any combination thereof.

DATED THIS 13TH DAY OF JANUARY 1986
AEPLC
BY ITS PATENT ATTORNEY
DAVIES & COLLISON