(12) UK Patent Application (19) GB (11) 2 224 809 (13) A

(43) Date of A publication 16.05.1990

(21) Application No 8826570.7

(22) Date of filing 14.11.1988

(71) Applicant
Davy McKee (Sheffield) Limited

(Incorporated in the United Kingdom)

Prince of Wales Road, Sheffield, Yorkshire, S9 4EX, United Kingdom

(72) Inventors
Bernard Harold Barber
Leslie Richard Morton

(74) Agent and/or Address for Service
Batchellor Kirk & Eyles
2 Pear Tree Court, Farringdon Road, London, EC1R 0DS, United Kingdom

(51) INT CL⁴
F16D 1/06

(52) UK CL (Edition J)
F2U U224 U272 U276 U392

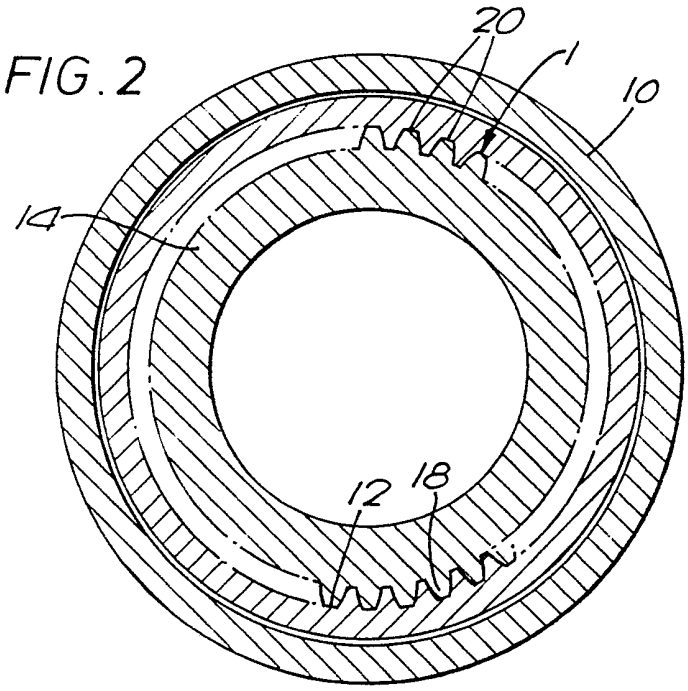
(56) Documents cited
GB 2165620 A GB 1128750 A GB 1116791 A
GB 0583940 A

(58) Field of search
UK CL (Edition J) F2U
INT CL⁴ F16D 1/00

(54) Gear coupling

(57) A gear coupling is disclosed wherein an inner externally toothed gear (14, 18) engages inside an annular internally toothed gear (10) to co-axially couple two shafts together. To reduce the wear caused by backlash as the torque which the coupling is intended to transmit is repeatedly applied to and withdrawn from the shaft, a layer of material, preferably in the form of a lattice (1) is provided in the valleys between the teeth of at least one of the gears.

FIG. 2



GB 2 224 809 A

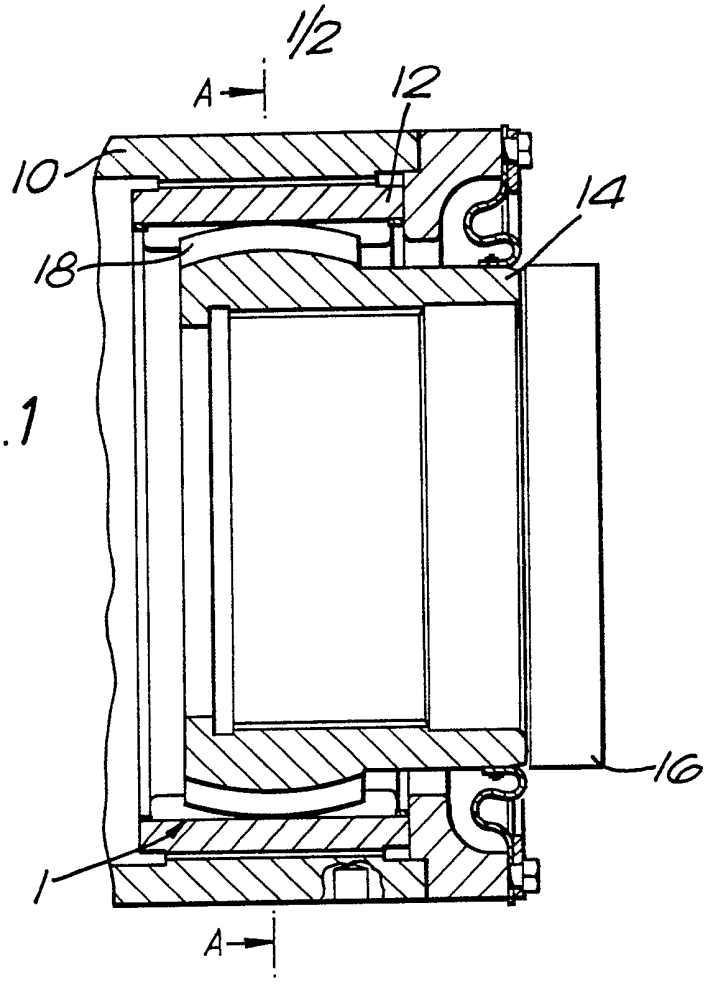


FIG. 1

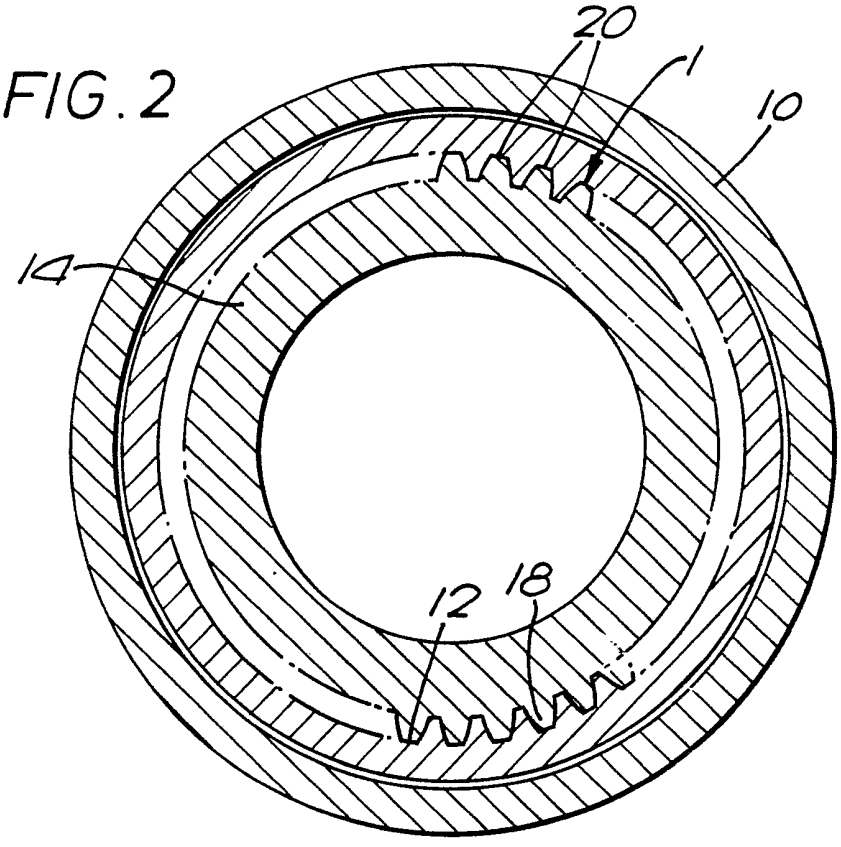


FIG. 2

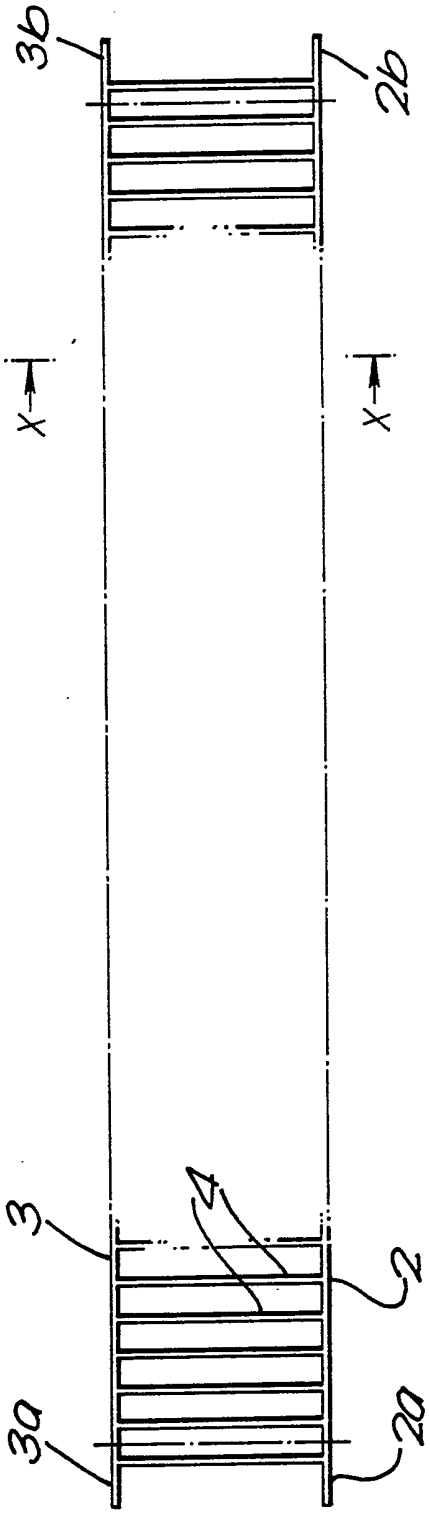


FIG. 3

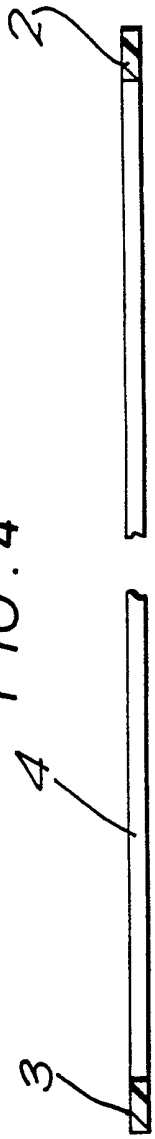


FIG. 4

REDUCTION OF WEAR IN GEAR COUPLINGS

The present invention relates to gear couplings and, in particular, though not exclusively, to splined couplings.

In a gear coupling, inner and outer gear units mesh together in order to transmit power between the shafts to which the gears are fixed. The teeth are cut to provide an optimum profile for transmitting power between the gears. This profile gives an optimum contact position between the gears. The teeth of the inner gear will rapidly "ride-up" the surface of the teeth on the other outer gear as load is applied to reach the optimum contact position and, conversely, when the load is removed, the inner gear will settle on to the outer gear. The apices of the uppermost teeth of the inner gear will rest in the bottom of the valleys between the lower teeth on the outer gear. Subsequently, when the gear coupling is again rotated there will be "knocking" between the gears as the teeth on the inner gear ride up to the teeth on the outer gear until the gears take up their operating position. This knocking damages the gear teeth and causes undesirable wear.

The present invention seeks to provide a means whereby the wear of the teeth of a gear coupling can be reduced.

The present invention provides a gear

coupling wherein either one or both of the gears of the coupling have a layer of material provided at the bottom of the valleys between the teeth so that settling of the gears on to one another is limited thereby.

In an aspect of the invention, a lattice of plastics material conforming to the pattern of the teeth and valleys of a gear is provided to fit into the valleys between the teeth to provide a support layer which can limit the settling of the gears of a gear coupling on to one another,

Preferably, the lattice is of polyurethane.

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 is a schematic axial cross-sectional view of an inner gear of a toothed coupling;

Figure 2 is a diametral cross-section on the line A-A of Figure 1;

Figure 3 is a plan view of support lattice for a gear of a toothed coupling of this preferred embodiment; and

Figure 4 is a cross-section along line X-X of Figure 3.

Referring now to Figures 1 and 2, a conventional gear coupling has an outer member 10 of generally cylindrical form which is connected to a drive shaft (not shown). The member is provided with

internal teeth 12. Fitted within the outer member there is an inner cylindrical member 14 which is arranged to receive the end 16 of a roll. The inner member 14 is provided with teeth 18 on its periphery. The teeth 18 mesh with the teeth 12.

Referring to Figures 3 and 4, a lattice 1 of polyurethane has side members 2, 3 and cross-members 4, all of rectangular section, arranged in a ladder-like manner. The profiled teeth 12 of the coupling have valleys 20 between them and the lattice 1 is fitted inside the outer member 10 with the cross members 4 lying in the valleys 20. The free ends 2a, 2b; 3a, 3b of each of the side members 2 and 3 are secured to each other by fusing them together. The lattice of polyurethane provides a support layer at the base of each valley on the outer toothed gear so that settling of the teeth of the inner gear into the valleys of the outer gear will be limited by engagement of those teeth with the polyurethane support layer and, because settling is limited, the knocking of the gear teeth when the coupling is rotated is also limited.

Variation may be made to the shape, construction and cross-section of the lattice. It is also envisaged that the lattice could be in the form of a plastics material applied in a malleable state in to the grooves to form the supporting layer.

CLAIMS

1. A gear coupling wherein either one or both of the gears of the coupling have a layer of material provided at the bottom of the valleys between the teeth so that settling of the gears on to one another is limited thereby.

2. A gear coupling according to claim 1 wherein the layer of material is provided by a lattice deposited on at least one of the gears.

3. A gear coupling according to claim 2 wherein the lattice comprises a pair of substantially parallel elongate longitudinal members joined by a plurality of regularly spaced lateral members disposed such that the gear teeth of one gear are received in the vacancies bounded by the members.

4. A gear coupling according to claim 3 wherein free ends of the longitudinal members are joined to form endless members.

5. A gear according to any preceding claim in which the layer of material is polyurethane.

6. A lattice to provide a layer of material in the valleys between the teeth of the gears in a gear coupling

comprising at least one elongate longitudinal member and a plurality of regularly spaced lateral members joined thereto to define spaces between the members for the reception of the gear teeth of one of the gears of the coupling.

7. A gear coupling as herein described with reference to the accompanying drawings.

8. A lattice to provide a layer of material in the valleys between the teeth of the gears in a gear coupling, as herein described with reference to the accompanying drawings.

Published 1990 at The Patent Office, State House, 66/71 High Holborn, London WC1R 4TP. Further copies may be obtained from The Patent Office.