

# PATENT SPECIFICATION

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## (54) PUMP

(71) We, BURMAN & SONS LIMITED, a British Company, of Wychall Lane, Kings Norton, Birmingham B38 8AB, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a pump and more particularly (but not exclusively) to an oil pump such as may be used for example as a lubricating oil pump or a pressurised oil feed pump on internal combustion engines. The object of the invention is to provide an improved form of pump.

In accordance with one aspect of the invention there is provided a method of manufacturing a pump of the kind having a housing in which is mounted a rotor supported on a spindle which extends through the housing wherein a bearing in the housing for said spindle is formed by first assembling a bush to the spindle and the housing is then formed by moulding a mouldable material containing a synthetic resin material around said bush.

The invention also resides in a pump when made by a method as above described. Preferably the synthetic resin material comprises a glass fibre reinforced polyester material and said bush comprises a carbon filled p.t.f.e. sleeve. Furthermore, the exterior of said bush is desirably shaped so that it is precluded from axial or angular movement within said housing after the latter has been moulded as aforesaid.

The invention will now be more particularly described with reference to the accompanying drawing wherein

Figure 1 is an end view and  
Figure 2 is a sectional view on the line 2-2 of Figure 1 of one example of a pump constructed in accordance with the present invention.

Referring now to the drawing the pump shown therein is intended for use as an internal combustion engine lubricating oil pump although of course it is to be understood that the present invention need not be limited to such an application alone. In the pump now described however there is provided a housing 10 having a fluid inlet 11 and a fluid outlet 12, together with a rotor 13 which is mounted for rotation within said housing. Said rotor 13 is supported on a spindle 14 which extends through the housing 10 to the exterior thereof whereby it can be drivingly connected to the engine for the purpose of rotating said rotor. There is also provided a cover 15 which closes the housing 10.

Said housing 10 is formed of a mouldable material comprising a synthetic resin material such as polyester material reinforced with glass fibre and it is necessary to provide a bearing in said housing for the spindle 14. To this end there is provided a bush 16 which is formed as a carbon filled p.t.f.e. sleeve which is formed so that it will initially be an interference fit on the spindle. Said bush is pressed on to the spindle and the assembly of the bush and spindle positioned in an appropriate mould whereafter the glass fibre reinforced polyester material is fed into the mould to form the housing 10. The exterior of said bush 16 is formed intermediate its ends with a circumferentially extending groove 17 and also with one or more longitudinally extending grooves or projections such as a groove 18 so that after the aforementioned moulding has been effected the bush will be retained in the housing in a position in which it is precluded from both axial and angular movement relative to the housing.

Assembly of the pump may then be completed and the aforementioned bush 16 will provide a bearing for the spindle 14.

By arranging that the bush 16 is an interference fit on said spindle 14 none of the polyester material used for moulding the housing 10 will be able to penetrate into the bore of the bush 16 between the bush and the spindle but at the same time when the moulding has been completed and the assembly of the pump finished the spindle will be able to turn within the p.t.f.e. bush 16 because of the low friction properties of the latter. The invention does however offer a saving over hitherto known pumps in that a cheaper synthetic resin material can be used to form the housing of the pump as opposed for example to an aluminium or aluminium alloy housing and at the same time by using a pre-assembled p.t.f.e. bush on the spindle none of the synthetic resin material used for forming the housing can penetrate into the bore of the bush as previously explained. If any such penetration did occur there may of course be problems in service since undue wear could be caused between the spindle and the bush.

25 WHAT WE CLAIM IS:—

1. A method of manufacturing a pump of the kind having a housing in which is mounted a rotor supported on a spindle which extends through the housing wherein a bearing in the housing for said spindle is formed by first assembling a bush to the spindle and the housing is then formed by moulding a mouldable material containing a synthetic resin material around said bush.
2. A pump when manufactured by a

method as claimed in Claim 1.

3. A pump as claimed in Claim 2 wherein the bush is formed from a low friction material and is arranged to be an interference fit on the spindle. 40

4. A claim as claimed in Claim 2 or Claim 3 wherein said housing is formed from a glass fibre reinforced polyester material and said bush comprises a carbon filled p.t.f.e. sleeve. 45

5. A pump as claimed in any one of Claim 2-4 wherein the exterior of said bush is shaped so that it is precluded from axial or angular movement within said housing after the latter has been moulded. 50

6. A pump as claimed in Claim 5 wherein the exterior of the bush is formed with a circumferentially extending groove and a longitudinally extending groove or projection. 55

7. A pump substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

8. A method of manufacturing a pump of the kind having a housing in which is mounted a rotor supported on a spindle which extends through the housing, said method being substantially as hereinbefore described. 60

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FIG.1.

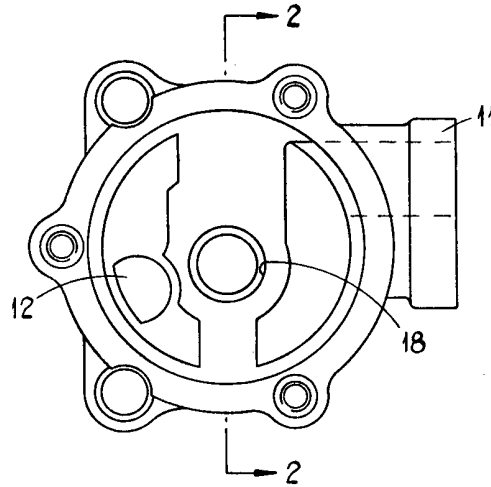


FIG.2.

