LOW FRICTION MOLDED FABRIC BEARING

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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The fabric may be impregnated with a moldable bonding resin and dried but not cured. For example, the fabric may be impregnated with a high strength phenolic bonding resin derived from the reaction product of phenol, cresol or a homologue with formaldehyde under controlled conditions. The mixture is preheated to remove the solvent and the resin content polymerized until a residual volatile content of 5% to 7% is attained. The drying temperature serves to heat shrink the cores 10 if the cores are formed of a heat-shrinkable material, or the moisture in the resin impregnant serves to shrink the cores if they are composed of a wet-shrinkable material such as cotton. This shrinking of the cores serves to compact the weave and at the same time to force the low friction wrapping 11 to the surface. Since the fillers 14, the core 10 and the outer wrapping 12 are bondable to the resin these elements are bonded together in the fabric to produce a structure wherein the exposed low friction and non-bondable plies 11 are firmly secured in place by the bondable plies.

The impregnated fabric thus dried may be stored for subsequent use or may be shipped to a distant point for molding.

For forming the bearing the fabric is then molded under heat and pressure into the form of a sheet 20 as shown in FIG. 6. The conversion of the resin into a thermostet form may be accomplished at a temperature of 350°F. to 350° F. for from thirty to sixty minutes at pressures of 10 tons to 100 tons, depending upon the area of the object being molded.

Other resin compositions may also be used as the impregnant, for example, polyvinylchloride or the epoxy resins. In the case of a liquid, such as polyvinylchloride the mold may be heated to the polymerizing temperature for polyvinylchloride i.e., 350°F. to 360°F. and immediately cooled to set the resin to solid form with the fabric embedded therein.

The epoxy resins are thermosetting and may be applied to the mold in the form of a molding powder. The mixture is cured by heating it to the proper temperature to convert the resin into the form of a solid body in which the fabric is embedded.

A bearing disc 25 is stamped out of the sheet 20. This disc 25 has low friction yarns exposed on both surfaces to constitute an anti-friction thrust bearing or seal which can be used for long periods of time without lubrication or excessive wear.

Although a specific use has been illustrated, the disc may be used generally where self-lubricating seals or thrust bearings are required.

The sheet 20 may of course be formed into other shapes as required for bearings for example into the form of a cylinder or a half cylinder from which cylindrical or segmental bearings may be cut. The sheet of the impregnated fabric may also be formed into a conical or hemispherical shape prior to curing to produce correspondingly shaped bearing elements.

What is claimed is:

1. A fabric for making a molded bearing composed of a compound yarn having a straight core of shrinkable organic material and a layer of a yarn composed of a member of the group consisting of polytetrafluoroethylene and polyvinylidifluoride wrapped around said core and exposed at least in part at the surface of said fabric, and a moldable resin in the dried but uncured state impregnating said fabric.

2. A fabric for forming molded bearings embodying a compound yarn composed of a straight core of a shrinkable organic material which is capable of bonding to a resin impregnant a layer of a yarn composed of a member
of the group consisting of polytetrafluoroethylene and polychlorotrifluoroethylene wrapped around said core in a given direction, an outer wrapping of a yarn composed of a material capable of bonding to a resin impregnant disposed around said first layer and wound in the opposite direction, yarns composed of a material capable of bonding to a resin impregnant crossing said first yarns and a resin impregnant in the dried but uncured state impregnating said fabric and bonding said bondable yarns together.

3. A molded fabric bearing comprising a heat curable thermosetting resin in the hard compacted state characteristic of a resin cured under heat and pressure, and a woven fabric embedded therein and bonded thereby, said fabric being composed of a compound yarn having a straight core formed of a shrinkable organic material which is bondable to said resin and having disposed around said core a wrapping of a yarn composed of a member of the group consisting of polytetrafluoroethylene and polychlorotrifluoroethylene which is not bondable to said resin, said wrapping forming the exposed surface of said bearing.

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