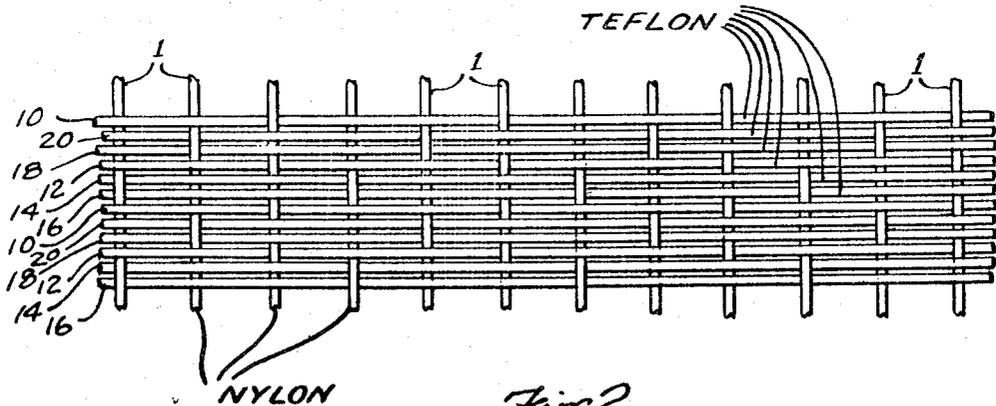
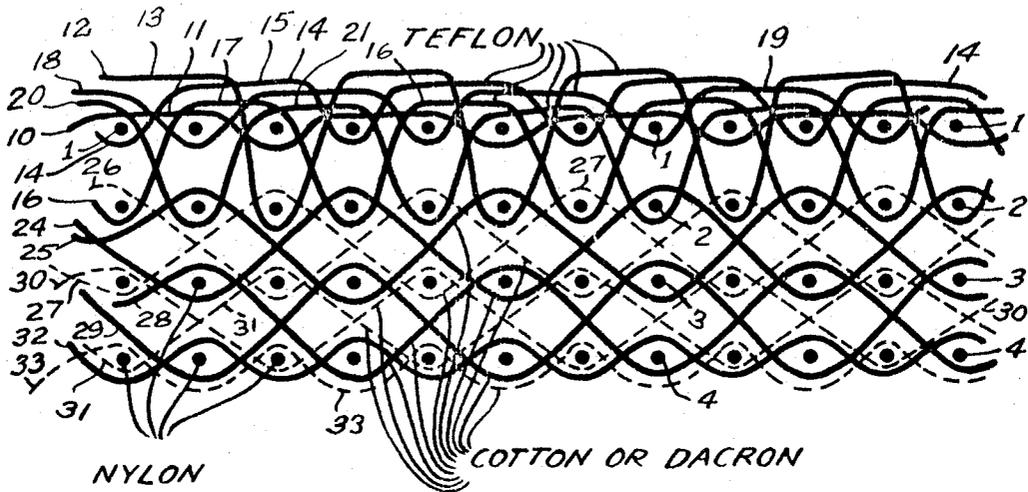


Dec. 2, 1958

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ANTI-FRICTION FABRIC  
Filed May 28, 1957

2,862,283

*Fig. 1.*



*Fig. 2.*

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**ANTI-FRICTION FABRIC**

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Application May 28, 1957, Serial No. 662,071

6 Claims. (Cl. 28—80)

This invention relates to fabrics and more particularly to a fabric having an anti-friction surface.

An object is to provide a fabric suitable for use in bearings, bushings, airplane ski liners and other parts having sliding surfaces.

Another object is to provide a fabric having anti-icing properties for such uses as air intake ducts, venturis, the leading edges of airplane wings or the like.

Another object is to provide a fabric construction wherein yarns composed of anti-friction material are bound into a backing which is adapted to be bonded by an impregnant to a supporting surface and which is moldable when impregnated with a phenolic resin or the like to form a rigid, self-sustaining product.

Other objects and advantages will be apparent as the nature of the invention is more fully disclosed.

It has been found that Teflon, a tetrafluorethylene product, has such a low coefficient of friction that it will not adhere to other materials and cannot be bonded by the usual impregnants or adhesives. For the same reason it is especially adapted to the uses above named. It forms a bearing surface which requires no lubrication. Also since it will not adhere to ice it forms a superior liner for vehicle skis or runners and for other purposes where icing is to be eliminated.

However, by reason of these characteristics it is difficult to fabricate Teflon into a surface layer which is permanent in form and can be attached by a bonding impregnant to a supporting member.

A further object of the present invention is to provide a fabric construction which overcomes the above difficulties and is capable of being physically bonded.

In a specific embodiment this is accomplished by weaving a multi-ply fabric in which the Teflon yarns are disposed as floats on one surface and are bound under spaced filler yarns in both the upper ply and the second ply. The filler yarns of the third and subsequent plies are bound by chains of a material capable of bonding to an impregnant, such as cotton or spun Dacron, and the various plies are bound together by spaced crossed chains. The filler yarns are composed of a material having a high tensile strength, such as nylon, high tenacity rayon, continuous filament Dacron or the like.

With this construction the fabric retains an impregnant and can be bonded to a supporting surface or molded. The Teflon is mechanically bound to the fabric plies and is retained in place thereby.

The nature of the invention will be better understood from the following description, taken in connection with the accompanying drawing in which a specific embodiment has been set forth for purposes of illustration.

In the drawing:

Fig. 1 is an expanded sectional view of an enlarged scale, illustrating a fabric embodying the present invention; and

Fig. 2 is a top plan view of the fabric.

Referring to the drawing more in detail the fabric is

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shown as comprising four plies or rows of filler yarns 1, 2, 3 and 4, respectively.

In each dent the warpwise yarns comprise a first Teflon yarn 10 which passes over two filler yarns 1 and under a third filler yarn 1 to form floats 11 on the upper surface of the fabric. A second Teflon yarn 12 passes over two filler yarns 1 to form floats 13 and under a third filler yarn 1 of the upper ply and also under a filler yarn 2 of the second ply which lies directly beneath the third filler yarn 1 of the upper ply so as to bond the first ply to the second ply.

The second dent includes a Teflon yarn 14 which is woven over two filler yarns 1 to form floats 15 and under a third filler yarn 1, and a third Teflon yarn 16 passing over two filler yarns 1 to form floats 17 and then under a third filler yarn 1 and under a filler yarn 2 of the second ply. The weave of the second dent is similar to the first dent but is displaced by one filler shot.

The third dent includes a pair of Teflon yarns 18 and 20 woven to form floats 19 and 21 and bound under the filler yarns of the first and second plies as above described but displaced by one filler shot from the Teflon yarns 14 and 16, the surface appearance being similar to a twill weave.

Of course the length of the floats and the sequence of the Teflon yarns may be varied as desired. The weave provides exposed Teflon yarns on the surface which are mechanically bound in place by the filler yarns of both the upper and the second plies.

The second and third plies are bound in one dent by warps 24 and 25 which pass under and over every second filler yarn 2 and 3, crossing between the plies. Other warp yarns 26 and 27 of a second dent, shown by dotted lines for clarity, are similarly disposed but are displaced by one filler shot from the warp yarns 24 and 25. The warp yarns of the third and subsequent dents will repeat the pattern of the first two dents above described.

The third and fourth plies are bound together by crossed warp yarns 28 and 29 which pass under and over every second filler yarn 3 and 4, respectively. Similar warp yarns 30 and 31 in a second dent are displaced by one filler shot from the warp yarns 28 and 29. Warp yarns of the third and subsequent dents will be disposed to repeat the pattern of the first and second dents above described. The filler yarns 4 are bound by a single yarn 32 and 33 in the respective dents which cooperate with the yarns 28 to 31 to form chains.

The filler yarns 1 to 4 are preferably composed of a material having a high tensile strength such as nylon or high tenacity rayon. The warp yarns 24 to 31 and chains 32 and 33 may be composed of a material capable of being bonded to an impregnant, such as cotton or spun Dacron.

While four plies have been shown it is to be understood that the number of plies may be varied in accordance with the required thickness of the product.

In use the fabric is impregnated with a phenolic resin or the like which is moldable under heat and pressure into a rigid structure. When the fabric is so impregnated and cured under heat and pressure the various yarns and plies will be secured in place but as the impregnant will not bond to the Teflon, the Teflon surface remains exposed.

The fabric can be used as a bearing surface, or as a liner for air ducts or venturis which are subject to icing, as a liner for airplane wings, as a liner for vehicle skis or as bushings or bearings or for various other purposes as will be apparent to a person skilled in the art.

What is claimed is:

1. A fabric having an anti-friction surface comprising a plurality of plies or layers of filler yarns, warpwise yarns having anti-friction characteristics woven over at least two adjacent filler yarns of the upper ply to form

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surface floats, certain of said warpwise yarns being bound between floats under upper ply filler shots and other of said warpwise yarns being bound between floats under filler shots in the second ply to bind said upper ply and second ply together, and other warpwise yarns binding the filler yarns of said second ply and a third ply.

2. A fabric as set forth in claim 1 in which said anti-friction yarns are composed of Teflon.

3. A fabric as set forth in claim 2 in which said filler yarns are composed of nylon.

4. A fabric as set forth in claim 3 in which said other warpwise yarns are composed of a material capable of bonding to an impregnant.

5. A fabric as set forth in claim 4 having a heat set phenolic resin impregnant bonding said plies into a rigid structure with said Teflon yarns exposed at the surface thereof.

6. A fabric composed of filler yarns disposed in at least three plies, Teflon warp yarns woven as surface floats spanning a plurality of upper ply filler shots and bound under other upper ply filler shots, other Teflon warp yarns woven as floats spanning a plurality of upper ply filler

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yarns and bound under spaced second ply filler yarns, other warp yarns forming chains extending between second ply filler yarns and third ply filler yarns to bond said plies together, other chain yarns bonding the filler yarns of the bottom ply, said other warp yarns and said chain yarns being composed of a material capable of bonding to an impregnant, and a heat set phenolic type resin impregnating said fabric and bonding the same in a rigid structure with said floats of Teflon yarn exposed at the upper surface thereof.

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