

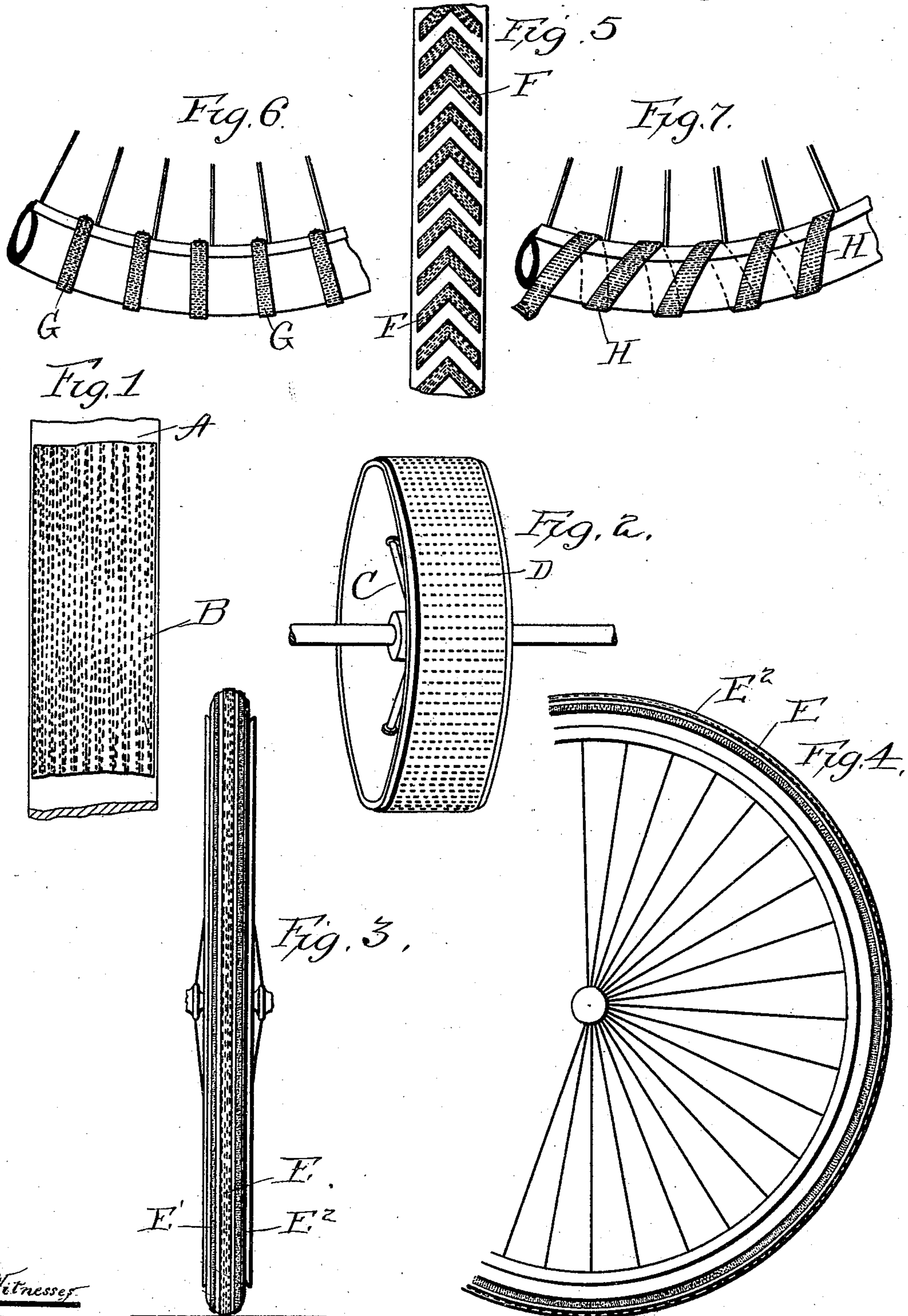
(No Model.)

A. PULBROOK.

FRICTIONAL SURFACE FOR CYCLE WHEELS, &c.

No. 544,688.

Patented Aug. 20, 1895.



Witnesses

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FRICTIONAL SURFACE FOR CYCLE-WHEELS, &c.

SPECIFICATION forming part of Letters Patent No. 544,688, dated August 20, 1895.

Application filed June 19, 1894. Serial No. 515,081. (No model.)

To all whom it may concern:

Be it known that I, ANTHONY PULBROOK, solicitor, a subject of the Queen of Great Britain, residing at 14 Victoria House, South Lambeth Road, London, in the county of Surrey, England, have invented certain new or improved means and material for obtaining grip or adhesion in cycle-wheels, machinery belting, boot and shoe soles, and other cases where a good grip or adhesion or freedom from slip is required, of which the following is a specification.

This invention relates to the utilization of the rough skin of fishes for the purpose of supplying a suitable rough surface in any case where it is desired to secure a good grip or adhesion or to prevent slip between two surfaces—as, for example, in cycle and other vehicle wheels to prevent slipping of the driving-wheels on the ground, in machinery belting to prevent slipping between the driving-belts and their pulleys, in the soles of cricketing, lawn-tennis, running, and other descriptions of boots and shoes, and in the treadles of cycles, sewing-machines, &c.

I prefer to use that kind of fish-skin where true scales are absent and are replaced by the ossified papillæ of the cutis—such as the skins of sharks, balistidæ, spotted dog-fish, and such like; also of fishes having what has been termed “placoid” scales, as rays and such like. These skins may be employed in their raw state or dried, tanned, tawed, or otherwise suitably treated, and they may be used either alone or in combination with other fish-skin, ordinary leather, india-rubber, canvas, or any kind of textile fabric or flexible material, and in one or more layers sewed, cemented, solutioned, or otherwise fixed to such material and to each other.

I sometimes coat the rough side of the fish-skin with india-rubber solution, made very thin. This I put on in layers, permitting each layer to dry before applying the next. Each successive layer finds its own level on the top of the preceding layer, and combined they surround and form a support for the papillæ or spines which project outside the layers of solution, and the fish-skin is thereby strengthened to resist wear and tear and moisture, and the papillæ are preserved firm, being flattened by use. I preferably dust a little

French chalk, flowers of sulphur, or other fine material having similar characteristics, over the top of the last layer of solution when thoroughly dry. Instead of india-rubber solution a solution of gutta-percha or of balata may be used.

When employing balata for coating the rough side of the fish-skin, I prefer to do so in the following manner: I first soak the skin for twenty-four hours in a solution composed of one ounce of borax in one quart of water. I then thoroughly cleanse it in clean distilled water, dry it in the dark, and keep it free from moisture. I then coat it on the rough side in a dry room with a solution of balata made of one part of balata to two parts of chloroform, or of one part of balata to three parts of bisulphide of carbon, or of one part of balata to seven parts of mineral naphtha. I do not bind myself to this manner of treating the skins or to the exact proportions above given of balata to chloroform, bisulphide of carbon, or mineral naphtha, as the proportions may be varied somewhat; but I have obtained satisfactory results with the means of treatment and the proportions given.

In the accompanying drawings I have shown various applications of the fish-skin above described for the purposes of preventing slipping or obtaining a grip.

In the drawings, Figure 1 shows part of a driving-belt A with rough fish-skin B cemented or sewed to the under side thereof—that is to say, to the side which comes next the pulley it is intended to drive. Fig. 2 shows a pulley C, the periphery of which is covered with rough skin D, the spines or ossified papillæ being placed outward. Fig. 3 is an end view, and Fig. 4 a partial side view, of a cycle-wheel with strips E E' E² of rough fish-skin applied to the tread part of the tire to prevent slipping. The middle strip E is preferably so disposed that the spines on it have their points directed circumferentially in a direction that will enable them to bite into the road or track and prevent slipping circumferentially, while the side strips E' E² may be so disposed that the points of the spines are directed sidewise, so as to prevent lateral slipping. Fig. 5 is an elevation of part of the tire of a wheel with V-shaped pieces F of rough fish-skin fixed thereto, so as to pre-

vent slipping both circumferentially and laterally. Fig. 6 shows part of the rim and tire of a cycle-wheel with separate strips G of rough fish-skin secured transversely round the same, and Fig. 7 shows part of the rim and tire of a cycle-wheel with a strip H of rough fish-skin wound helically round the same for the purpose of preventing slipping.

In applying this fish-skin material to the tire of a cycle-wheel, for example, I cement with india-rubber solution or other suitable adhesive material one or more strips of it longitudinally round the outer tread of the tire, so that the sharp points of the ossified papillæ bite into the road or track as the wheel revolves and prevent slipping and thereby loss of power, or the material may be cemented, sewed, or otherwise attached to leather, canvas, webbing, silk, or other suitable substance, which may be fastened by cement, buckles, hooks, laces, or otherwise to the tire or to the outer cover thereof. These arrangements prevent the slip of the wheel circumferentially. In order to prevent slipping or skidding sideways strips or pieces of the fish-skin may be attached to the tire so that their ossified papillæ point outward—that is to say, in the direction in which slipping or skidding might take place. Sometimes I wind the skin, or the skin and the substance to which it is attached, obliquely or otherwise, around the tire and rim of the wheel, taking care to place the ossified papillæ so that they point as nearly as possible in the best direction to perform their function of preventing slipping.

In order to attach the fish-skin to the india-rubber or other material by india-rubber solution or cement, I find it advantageous to

rub the inside surface of the skin with sand-paper, emery-paper, or pumice-stone before putting the solution on it.

In applying this fish-skin material to driving-belts for machinery it may be sewed or cemented thereto with the rough side next the pulley, and in some cases the pulley itself may be covered with such skin, the rough side being outside toward the belt.

In applying this fish-skin material to other objects it may be used in any way best suited for the particular purpose in view, care being taken to place the ossified papillæ so that their points face in the direction best suited to produce the required grip or adhesion.

I claim—

1. In combination with a friction surface, a fish skin covering applied to such surface, with the scales outward for the purpose of preventing slipping, substantially as described.

2. In combination with a driving surface, a fish skin covering applied thereto, with the scales outward, said scales having a strengthening or protecting covering, substantially as described.

3. The process of coating the scaly side of fish skins for friction purposes, consisting in first soaking the skin in a solution of borax, then cleansing and drying the same, and finally coating it with a solution of gutta percha or the like substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ANTHONY PULBROOK.

Witnesses:

WILLIAM HENRY BECK,
STEPHEN EDWARD GUNYON.