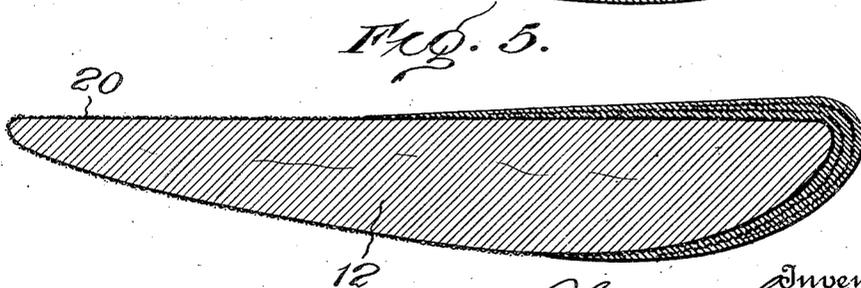
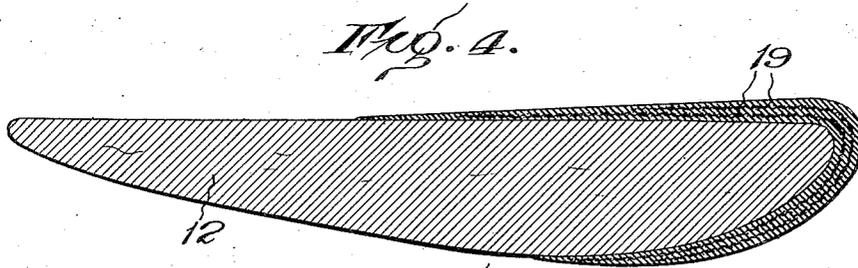
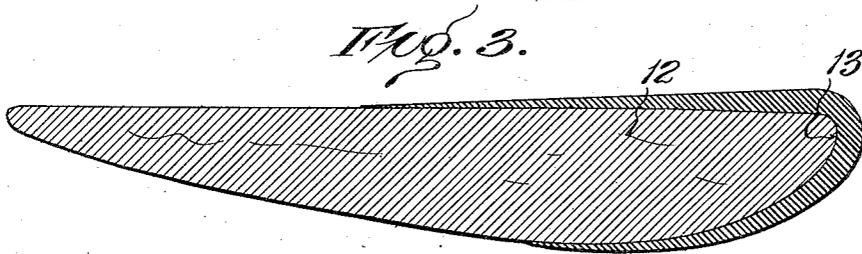
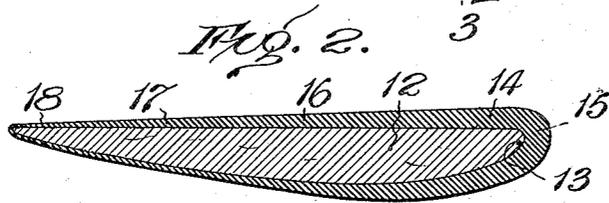
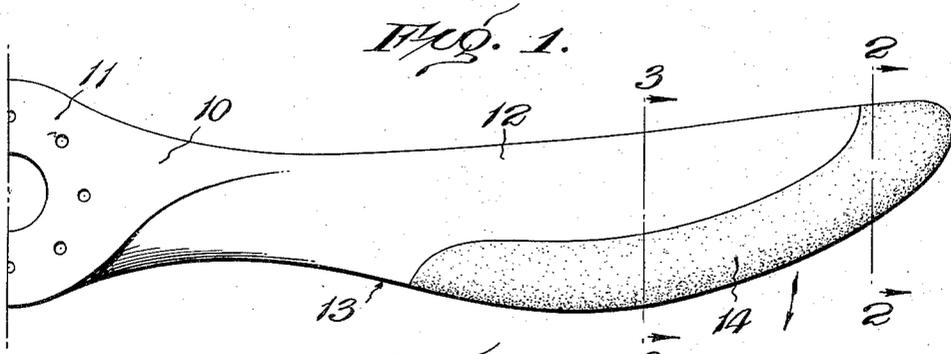


S. HEATH.
HIGH SPEED PROPELLER.
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1,364,197.

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UNITED STATES PATENT OFFICE.

SPENCER HEATH, OF BALTIMORE, MARYLAND.

HIGH-SPEED PROPELLER.

1,364,197.

Specification of Letters Patent.

Patented Jan. 4, 1921.

Application filed October 7, 1918. Serial No. 257,232.

To all whom it may concern:

Be it known that I, SPENCER HEATH, a citizen of the United States, residing at Baltimore, State of Maryland, have invented new and useful Improvements in High-Speed Propellers, of which the following is a specification.

My invention relates to propellers, and particularly high-speed propellers for aeronautical purposes. Such propellers, whether constructed of wood or of any other material sufficiently light and strong for aeronautical service, are subject to damage and wear on the leading edge and adjacent surfaces of the blades owing to the action of water and also the dirt, sand and gravel entrained when running along the surface of the ground.

In carrying my invention into effect I provide the leading edges and adjacent faces of the blades with protective covering of resilient yielding material such as rubber, this covering being applied and arranged as hereinafter indicated.

The invention consists in the novel construction and arrangement of parts of a protected propeller hereinafter described and claimed, and shown in the accompanying drawings, in which drawings,—

Figure 1 is a face view of a propeller made in accordance with my invention, one blade only of the propeller being shown;

Fig. 2 is a cross section of the same taken on line 2—2 of Fig. 1, but on a larger scale.

Fig. 3 is a cross section of the same taken on the line 3—3 of Fig. 1, also on a larger scale.

Figs. 4 and 5 are views similar to Fig. 3 showing further details of the construction.

Referring to the drawings 10 indicates a propeller which may be of any preferred design and which may have any desired number of blades. In the one illustrated the propeller is of the two blade type, only one blade being shown. 11 indicates the hub of the propeller and 12 indicates the blade, the latter having a leading edge 13.

The propeller may be constructed of any suitable material having sufficient lightness and strength, but the material preferred is wood which is now generally employed for high-speed aeronautical propellers. In the use of such propellers it is found that there

is considerable bending of the blades owing to wind pressure, and it is also found that there is considerable wear and tear on the blades, particularly the leading edges thereof and the face portions adjacent said edges, owing to action of water and also the dirt, sand and gravel entrained when running along the surface of the ground. The efficient protector for these leading edges of the blades therefore must be flexible or resilient so as to accommodate itself to the flexure of the blade, and it must also be of sufficient toughness to withstand the necessary wearing effects to which it is subjected. For this purpose I provide a coating 14 of rubber or other yielding resilient material which is applied to the blade so as to cover the entire end portion, the leading edge, also the face portions of the blade adjacent said edge. This coating is preferably thicker at the edge, as indicated at 15, and is of decreasing thickness gradually at increasing distances progressively from said edge, as shown at 16, 17 and 18. Also, in the same proportion, or in any other desired proportion, I may increase the hardness of the resilient material progressively upon the blade at increasing distances from the leading edge, the portion shown at 18 being harder than that at 17, for instance.

The coating is applied to the blade either in the unvulcanized form and is then vulcanized *in situ*, or it may be completely formed in the first instance and then applied to the blade by cementing or in any other suitable way.

As shown in Figs. 4 and 5 the coating may be reinforced by one or more layers of fabric embedded in the rubber or other material so as to increase the toughness and strength of the layer.

In some classes of blades it is desirable to wrap the blade with fabric for the purpose of increasing its strength, and in such instances I first apply said wrapping as indicated at 20 in Fig. 5, and then apply my protecting coating, as before indicated.

In the use of a propeller as constructed in accordance with my invention it will be seen that the tough and resilient rubber coating readily accommodates itself to the bending of the blades, and also resist wear by cushioning the shock of sand, gravel, etc., which contact with the blade during its rapid

revolution, thereby avoiding injury to the blade and providing a structure which will last for a long time.

While I have described a specific embodiment of my invention, it will be understood that many modifications and changes may be made without departing from the invention, and all such I intend to include within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. The combination with an aerial propeller blade, of an edge protector therefor comprising a coating of yielding resilient material covering the edge of the blade and face portions adjacent thereto.

2. The combination with an aerial propeller blade, of a leading edge protector therefor comprising a coating of yielding resilient material covering the edge of the blade and face portions adjacent thereto.

3. The combination with an aerial propeller blade, of an edge protector therefor comprising a coating of yielding resilient material covering a leading edge of the blade and face portions adjacent thereto, said protector being thickest at said edge.

4. The combination with a flexible aerial propeller blade, of an edge protector therefor comprising a coating of yielding resilient material covering the edge of the blade and face portions adjacent thereto.

5. The combination with an aerial propeller blade, of an edge protector therefor comprising a coating of yielding resilient material covering a leading edge of the blade and face portions adjacent thereto, said protector being thickest at the edge, and of gradually decreasing thickness upon the blade surfaces.

6. The combination with an aerial pro-

pellor blade, of an edge protector therefor comprising a coating of yielding resilient rubber covering the edge of the blade and face portions adjacent thereto.

7. The combination with an aerial propeller blade, of an edge protector therefor comprising a coating of yielding resilient material covering the entire end of the blade and the leading edge, and portions of the blade faces adjacent thereto for a distance along said edge toward the inner end of the blade.

8. The combination with a propeller blade, of an edge protector therefor, comprising a coating of rubber having fabric embedded therein and covering a leading edge of the blade and face portions adjacent thereto.

9. A propeller blade comprising a wooden body portion of suitable shape, a reinforcing fabric covering for said blade, and an edge protector for said blade comprising a coating of yielding resilient material applied over said fabric and covering the edge of the blade and face portions adjacent thereto.

10. The combination with a propeller blade, of an edge protector therefor, comprising a coating of yielding resilient material covering a leading edge of the blade and face portions adjacent thereto, said material being of gradually increasing hardness or stiffness from said edge at increasing distances therefrom upon said blade.

11. The combination with a propeller blade, of an edge protector therefor, comprising a coating of vulcanized rubber covering a leading edge of the blade and face portions adjacent thereto, said rubber being vulcanized to increasing degrees of hardness at progressively increasing distances from said edge.

SPENCER HEATH.