

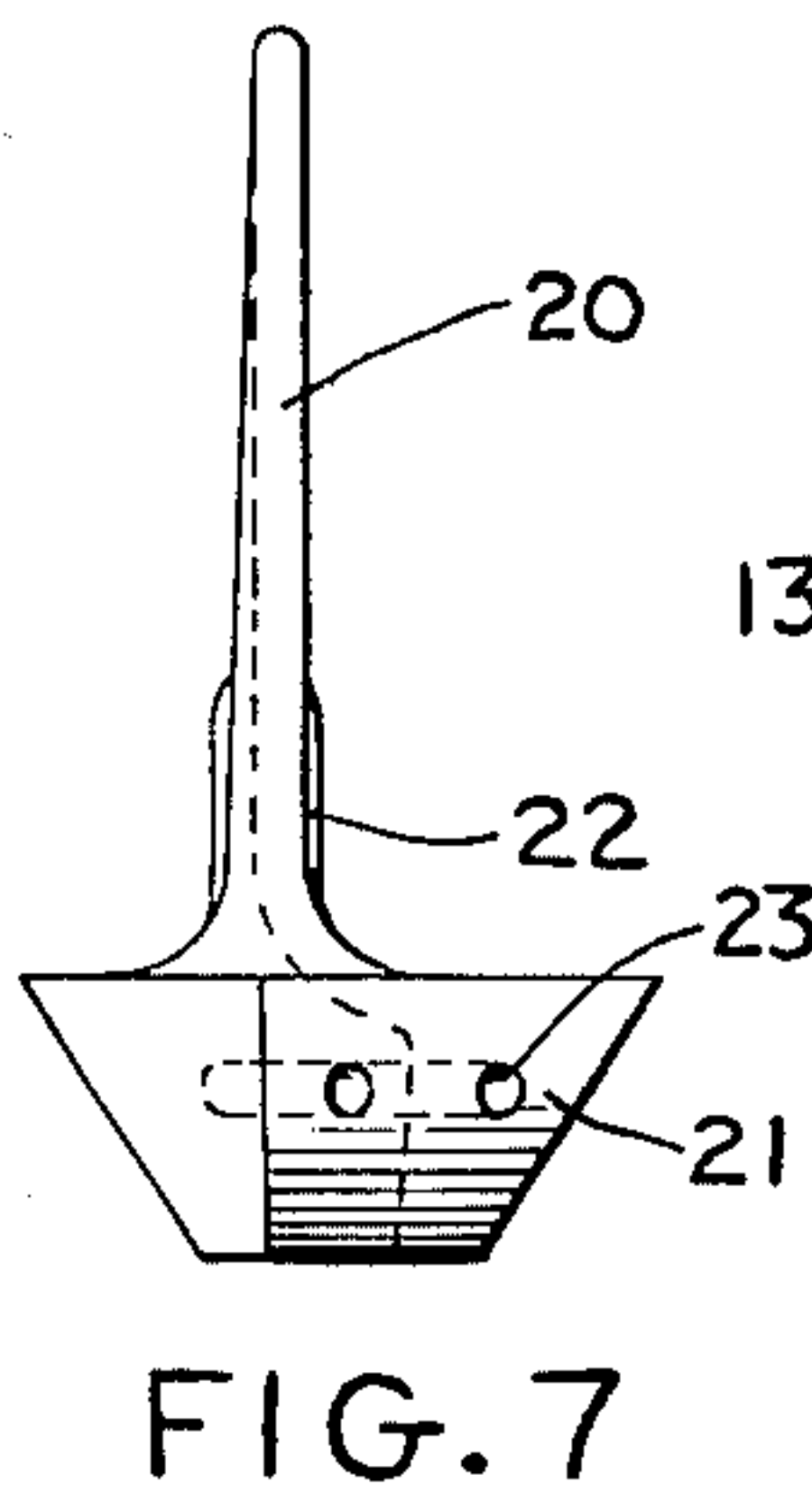
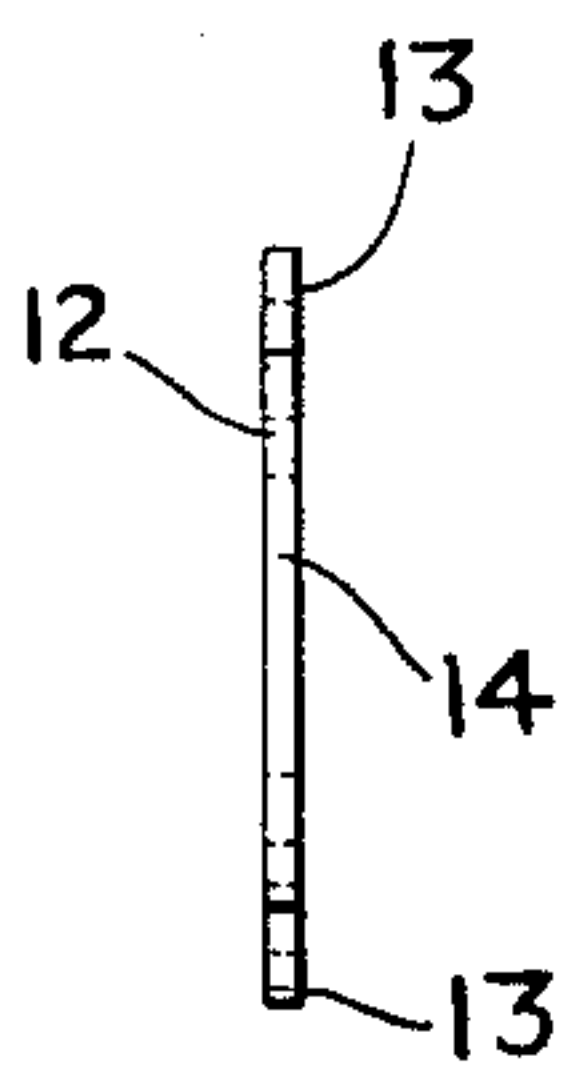
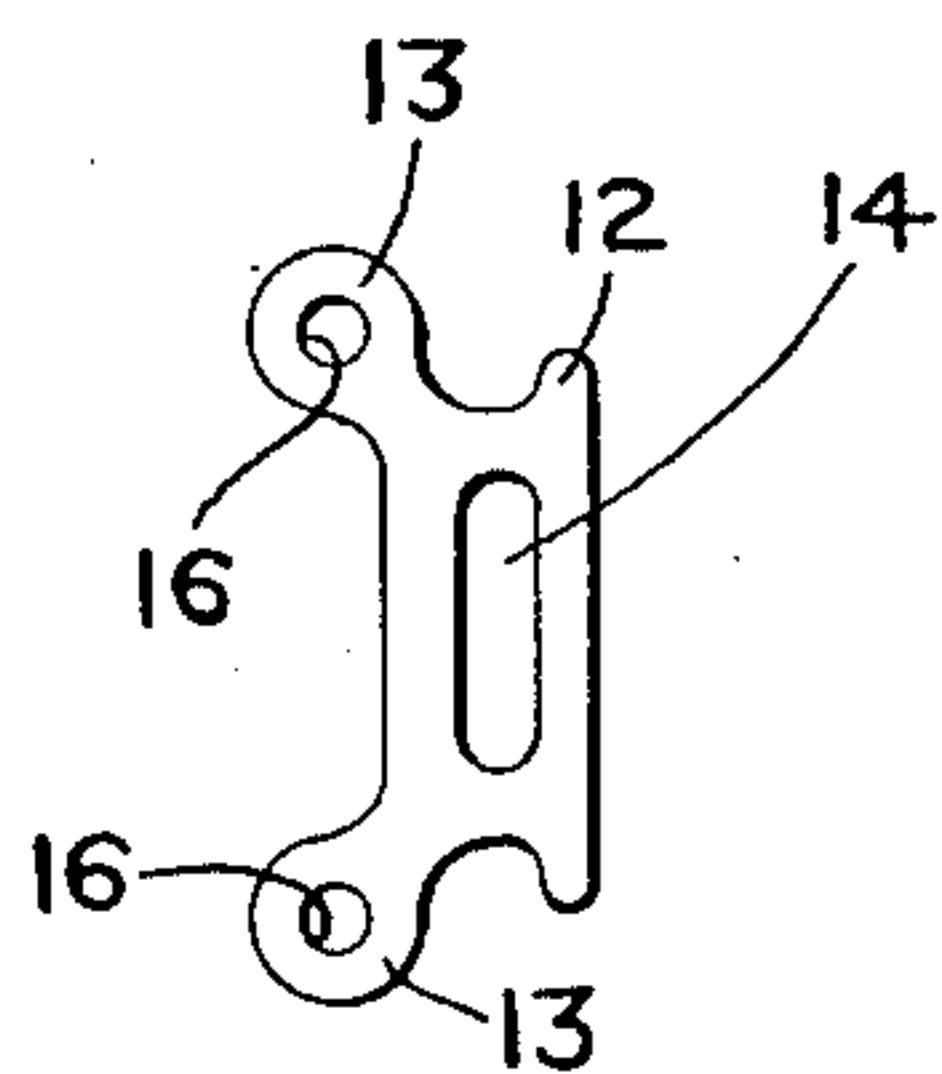
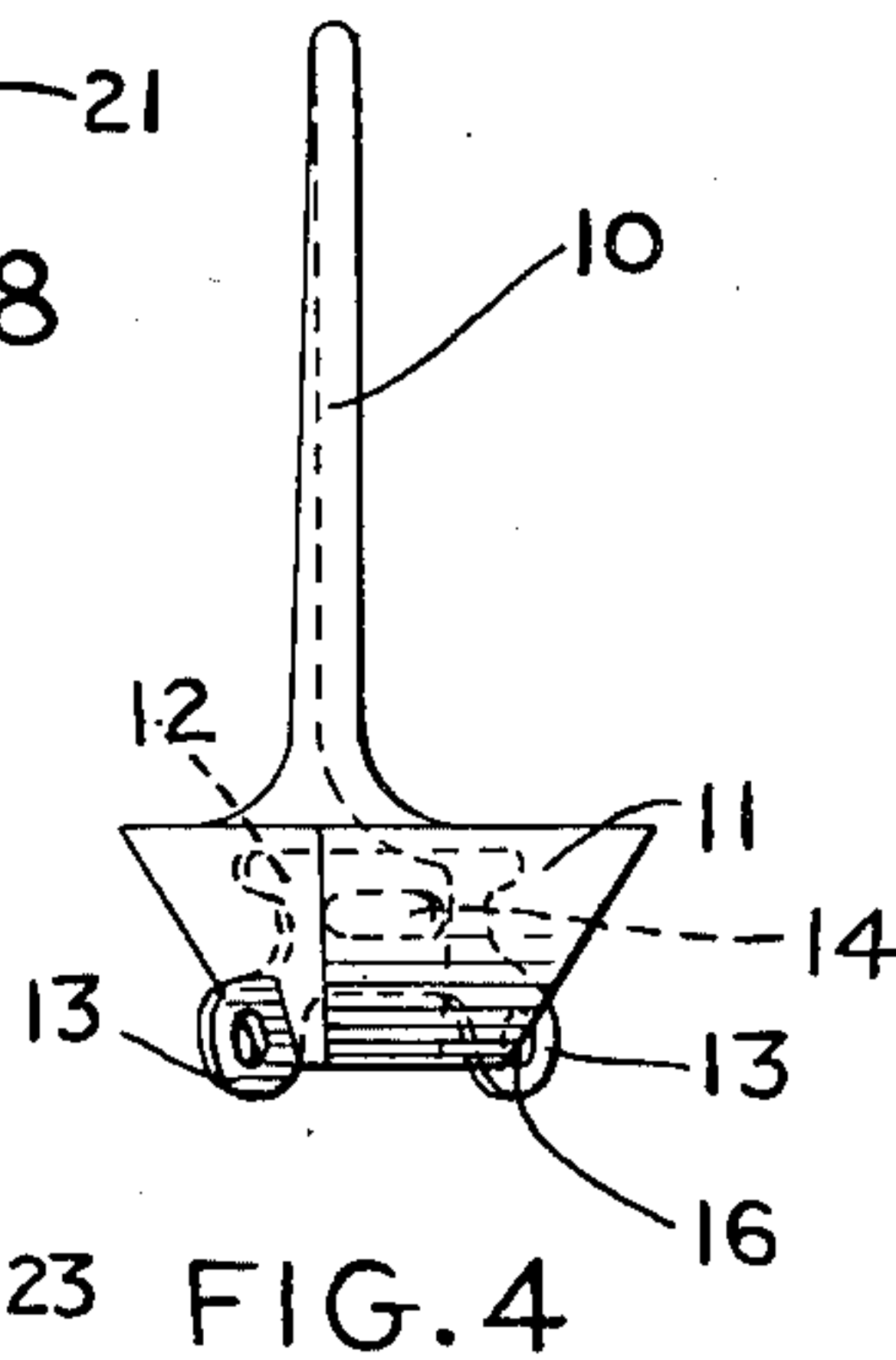
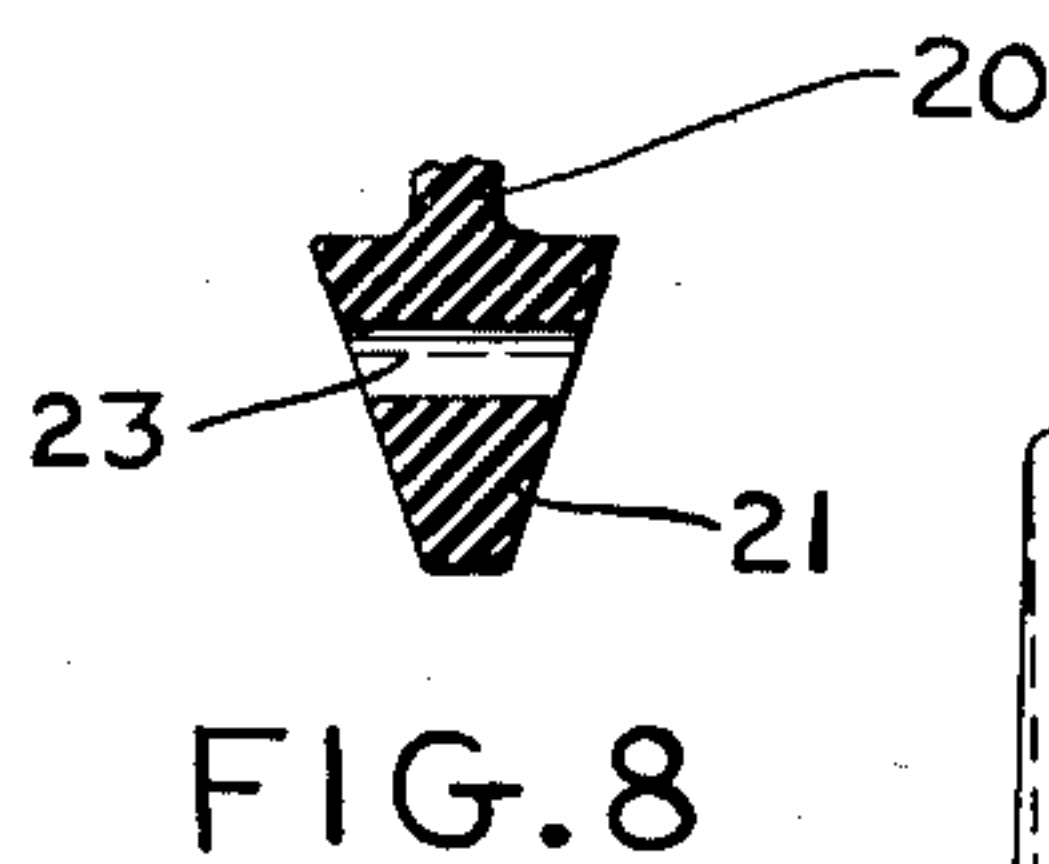
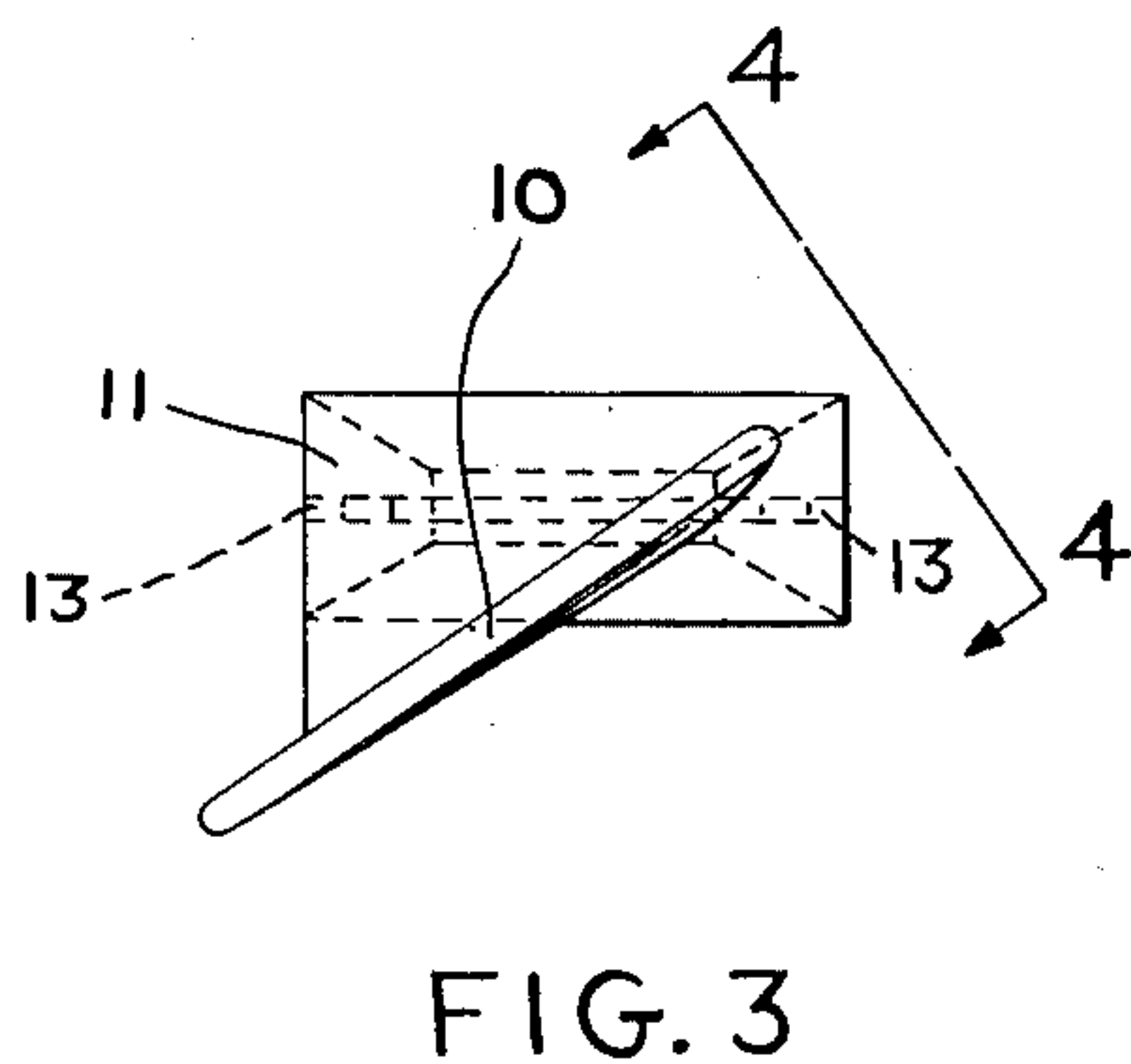
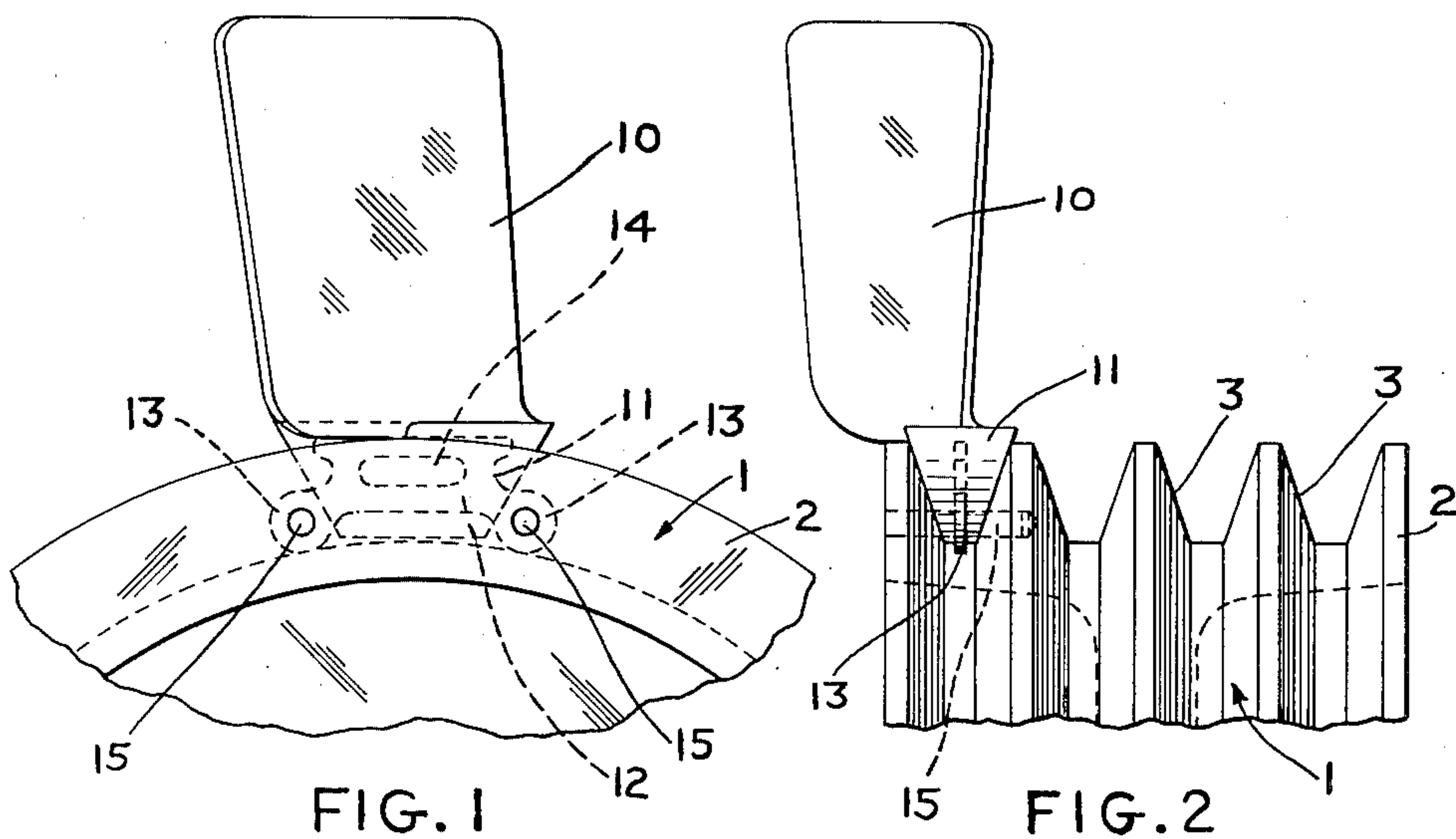
Feb. 24, 1953

W. A. STEWART

2,629,545

COMBINED FAN AND POWER TRANSMISSION SHEAVE

Filed Nov. 12, 1949



WARREN A. STEWART
INVENTOR.

BY *Robert M. Meyer*
Attorney

UNITED STATES PATENT OFFICE

2,629,545

COMBINED FAN AND POWER TRANSMISSION
SHEAVEWarren A. Stewart, Granby, Mass., assignor to
Worthington Corporation, a corporation of
Delaware

Application November 12, 1949, Serial No. 126,904

4 Claims. (Cl. 230—241)

1

This invention relates to fans and an object of the invention is to provide a combined fan and power transmission sheave for use on relatively small machines such as air or gas compressors and others employing a driving sheave and which require air circulation for cooling to prevent overheating of the machine during operation.

Another object of the present invention is to employ rubber fan blades in lieu of metal fan blades to remove possibility of damage to the blades by bending or other disfigurement and also to eliminate liability of injury to persons working near the machine.

A further object of the present invention is to provide individual blades, individually attached to a sheave, whereby fan capacity, blade pitch diameter and direction of rotation of fan can be changed to meet specific conditions without requiring expensive pattern and tooling costs.

A still further object of the present invention is to provide individual fan blades wherein the blade portion is offset from the base or bottom portion.

With these and other objects in view, as may appear from the accompanying specification, the invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawings, showing a combined fan and power transmission sheave of a preferred form embodying the invention, and the features forming the invention will be specifically pointed out in the claims.

In the drawings:

Figure 1 is a fragmentary side elevation of a sheave showing a fan blade attached thereto.

Figure 2 is a fragmentary edge elevation of a sheave showing a fan blade attached thereto.

Figure 3 is a top plan of one of the fan blades.

Figure 4 is an edge elevation of one of the fan blades looking in the direction indicated by the arrows in Figure 3.

Figure 5 is an elevation of a metal attaching member embedded in the rubber fan blade and serving to connect the blade to a sheave.

Figure 6 is a top plan of the metal attaching member.

Figure 7 is an edge elevation of a modified form of the fan blade.

Figure 8 is a fragmentary view partly in section of the modified form of fan blade.

Referring more particularly to the drawings 1 indicates a fragment of a sheave having a V-grooved rim; that is, the rim 2 of the sheave 1 is provided with a plurality of annular V grooves

2

3 in which V belts travel for the transmission of power to or from the machine with which the sheave is associated.

It is the custom, as shown by the prior art to use fans to cool various types of machines by circulation of air, and such fans have been attached in various manners to the machines; the present invention, however, comprehends the use of the power transmitting sheave as an element of the fan structure, by the attachment of fan blades in an extra annular V-groove of the sheave so as to provide a relatively inexpensive fan structure.

Figures 1 to 6, inclusive, of the drawings show one form of such fan blades.

The blade 10 is made of rubber of sufficient rigidity to provide fan operation, but sufficient flexibility to yield when contacted by a foreign object, so as to prevent mutilation of the fan blade, or injury to a person should some part of his body come in contact with the fan blades during operation of the fan.

The rubber fan blade 10 has a substantially V-shaped extension 11 formed on its inner attaching end, which is shaped to fit snugly in one of the V-grooves 3 of the sheave 1. The rubber fan blade 10 is formed in an angled offset position substantially diagonal to the longitudinal axis of the V-shaped extension 11. The object of offsetting the blade from the base member or extension 11 is to prevent the fan blade from extending into the V-groove adjacent the one that receives the fan blade all of which is clearly shown in Figure 2 of the drawing but will be pointed out in addition hereinafter.

A substantially rectangular metal attaching bracket 12 is imbedded in the inverted V-shaped extension 11, provided with perforated ears 13 formed therein which project out of the V-shaped extension as shown in Figures 1, 3, and 4 of the drawings.

The medial portion of the attaching bracket 12 is provided with a slot 14. Slot 14 facilitates the firm connection of the bracket 12 with the fan blade, in that during the moulding of the blade the rubber passes through the slot 14 and bonds with the rubber on the other side of the bracket. It will be understood that an extension or head (not shown) may be integrally formed with the attaching portion of the bracket to extend up into and be formed with the blade 10 so as to increase the rigidity and stiffen the blade at its junction with the inverted V-shaped extension 11.

In assembling the fan blades and sheave, the

inverted V-shaped extension 11 of the blade is inserted in a V-groove in the rim of the sheave and attaching pins 15 are driven through suitable holes in the sheave and the holes 16 in the ears 13. As many fan blades as desired or necessary may be attached to the sheave at properly spaced perimetrical points on the sheave, and it is to be understood that when they are so attached to a sheave, one with one more annular V-groove than is required for receiving belts is employed.

It is obvious that if the blade portion 10 is not offset in suitable fashion from the V-shaped extension 11 that it would extend over into the adjacent V-groove. This would nullify the use of this adjacent V-groove as the belt would interfere with the fan blade and in effect would require a sheave with two additional V-grooves. Accordingly, the present preferred form of construction as clearly shown in Figures 1 to 6 has been chosen.

The modified form of the invention shown in Figures 7 and 8 of the drawings utilizes the same principle as that shown in Figures 1 to 6, inclusive, of the drawings differing therefrom in the elimination of the metal attaching bracket.

In the modified form of the invention the rubber fan blade 20 has a V-shaped in cross section, extension 21 formed thereon which is the same as the extension 11, and this V-shaped extension is disposed angularly to the angle or pitch of the blade 20 the same as the extension 11 and as shown in Figure 3 of the drawings. The angular relation of the V-shaped extensions and fan blades, is provided so that the V-shaped extensions may fit properly and snugly in the V-groove in the sheave and the blade have the proper pitch for fan action and for clearance of the adjacent V-groove as above described.

The blade 20 is reinforced or increased in thickness, as shown at 22 to increase its rigidity at the joint of the blade 20 and extension 21.

The V-shaped extension 21 is provided with a plurality of transversely extending holes or openings 23 through which attaching pins (not shown) such as the pins 15 may be inserted for attaching the blade to a sheave.

It will be understood that the invention is not to be limited to the specific construction or arrangement of parts shown, but that they may be widely modified within the invention defined by the claims.

What is claimed is:

1. In combination with a power transmission sheave having an annular V-groove in its perimenter, of a fan blade, said fan blade having a V-shaped extension formed on its inner end for fitting in said groove, and means embedded in said V-shaped extension for attaching said V-

shaped extension to said sheave, said fan blade being thickened at and near its junction with said V-shaped extension and being disposed in acute angular relation to said V-shaped extension.

2. A fan blade for attachment in a V-groove of a power transmission sheave comprising a semi-flexible rubber blade, a substantially V-shaped extension formed upon the inner end of the blade, and a metal attaching member embedded in said blade and said V-shaped extension for attaching the blade to a sheave, ears formed upon said metal attaching member and provided with attaching pin receiving openings.

3. A fan blade for attachment in a V-groove of a power transmission sheave comprising a semi-flexible rubber blade, a substantially V-shaped extension formed upon the inner end of the blade, and a metal attaching member embedded in said blade and said V-shaped extension for attaching the blade to a sheave, said metal attaching member having an opening cut therein so that the material of which the blade and extension are formed will flow through the opening and form a bond to hold the attaching member in place.

4. A fan blade for attachment in a V-groove of a power transmission sheave comprising a semi-flexible blade, a substantially V-shaped extension formed upon the inner end of said blade, and a metal attaching member embedded in said V-shaped extension for attaching the blade to a sheave, said metal attaching member having an opening cut therein so that the material of which the extension is formed will flow through the opening and form a bond to hold the attaching member in place, said attaching member having ears formed thereon and provided with attaching pin receiving openings.

WARREN A. STEWART.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,638,648	Trotter et al.	Aug. 9, 1927
2,123,146	Preston	July 5, 1938
2,142,370	Parkoff	Jan. 3, 1939
2,183,891	Newnham	Dec. 19, 1939
2,251,887	Larsh	Aug. 5, 1941

FOREIGN PATENTS

Number	Country	Date
1,306	Great Britain	Jan. 20, 1908
619,913	Great Britain	Mar. 16, 1949
623,557	Great Britain	May 19, 1949