Aug. 17, 1943. I. N. POLLINGHER 2,327,061

FAN

Filed Oct. 14, 1939 2 Sheets-Sheet 1

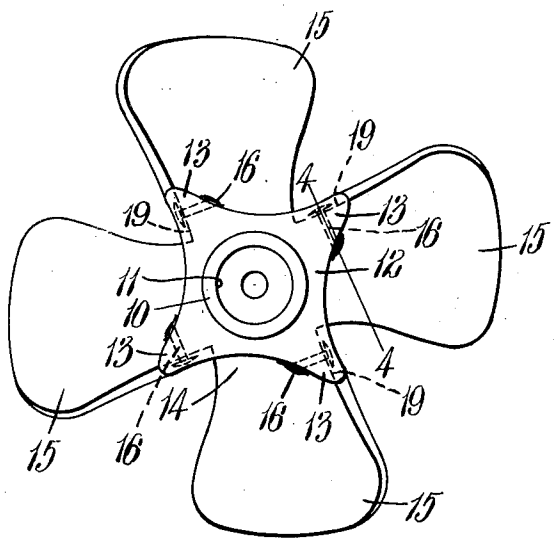


Fig. 1.

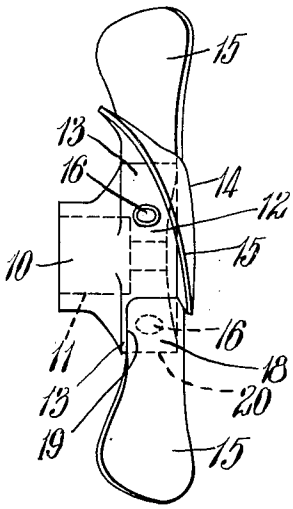


Fig. 2.

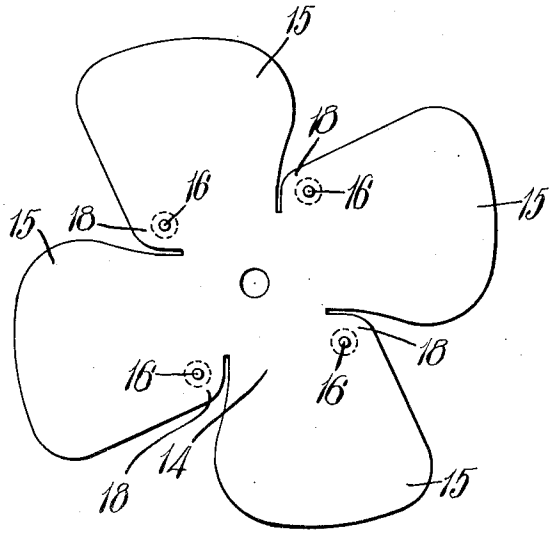


Fig. 3.

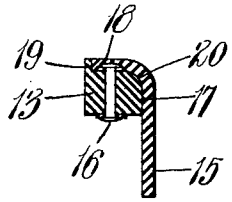


Fig. 4.

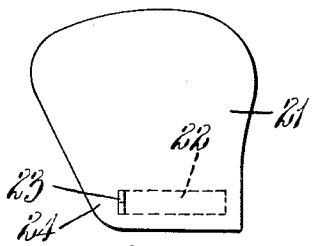


Fig. 5.

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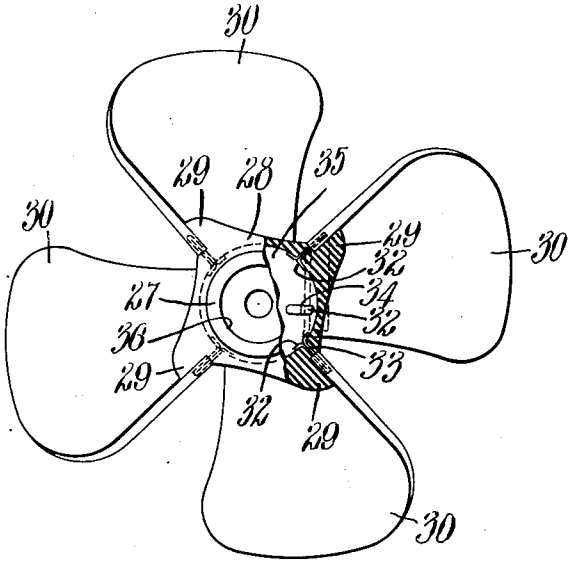


Fig. 7.

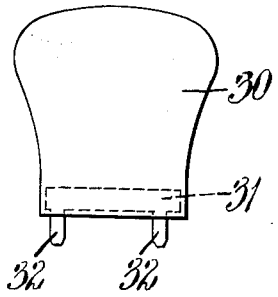


Fig. 8.

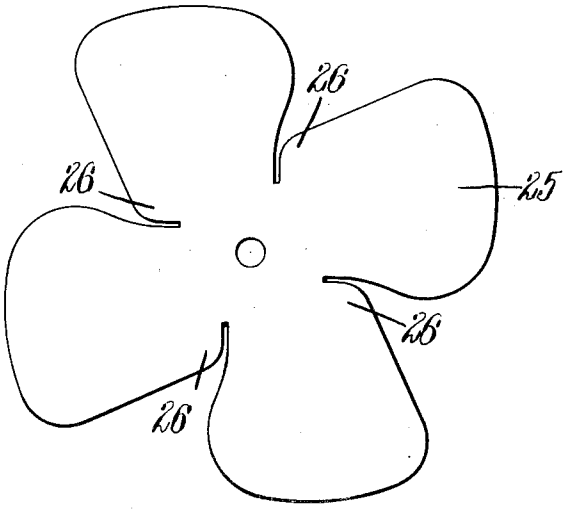


Fig. 6.

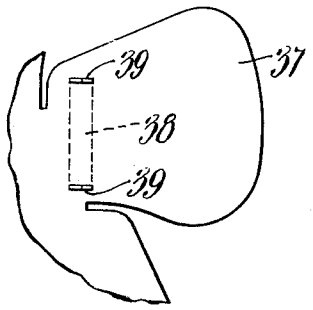


Fig. 9.

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UNITED STATES PATENT OFFICE

2,327,061

FAN

Isidor N. Pollingher, Boston, Mass.

Application October 14, 1939, Serial No. 299,419

7 Claims. (Cl. 170—173)

This invention relates to fans and has for its primary object to provide a fan of simple, inexpensive construction, preferably constructed of flexible material, as, for example, rubber or equivalent material, and having soft, flexible blades which do not require a protecting guard structure, and which upon being accidentally contacted by the body of a person or other objects will not cause injury to said person or objects.

Another object of the invention is to provide a fan having a hub member formed as a single piece of moulded rubber and provided with ears around which the blades of the fan are bent and formed and to which said blades are secured in a manner to twist the blades and, therefore, provide a pitch for the blades; the shape of the ears determining the degree of said pitch and curvature of said blades.

Still another object of the invention is to provide a combined stiffening member and securing means whereby the blades may be strengthened and secured to the hub portion of the structure.

The invention consists of a fan as set forth in the following specification and particularly as pointed out in the claims.

Referring to the drawings:

Fig. 1 is a front elevation of a fan embodying the teachings of my invention.

Fig. 2 is a side elevation of the fan.

Fig. 3 is a front elevation of a moulded unitary blade structure for the fan.

Fig. 4 is a detail section taken on the line 4—4 of Fig. 1.

Fig. 5 is a front elevation of a modification of an individual blade embodying the teachings of the invention.

Fig. 6 is a front elevation of another modified type of unitary blade structure cut from a piece of sheet material.

Fig. 7 is a front elevation, partly in section, illustrating another modified type of fan embodying the teachings of this invention.

Fig. 8 is a front elevation of another modified type of individual blade.

Fig. 9 is a front elevation illustrating a portion of another unitary blade structure embodying the teachings of this invention.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, referring particularly to Figs. 1, 2, 3 and 4, 10 represents a hub member constructed of a moulded material, preferably flexible rubber or equivalent material, recessed at 11 for expanded application to a driving member, as, for example, a driving shaft, or, the cylindrical portion of a rotatable member to which it may be secured by expanded frictional contact or any other suitable means. Formed integral with the hub member 10 is a flanged portion 12 having ears 13 embodied therein to which a unitary blade member 14 having a plurality of blades 15 is secured by means of rivets 16 and a suitable adhesive applied to adjacent contacting surfaces at 17. The blade member 14 is preferably moulded as one piece of soft, flexible rubber, and the head portions of the rivets 16 are embedded in said rubber, while the shank portion of the rivet projects outwardly through portions 18 of the blades which are bent or formed around the ears 13 as illustrated in Fig. 4. The ears 13 are recessed at 19 and provided with a curved corner portion 20, and when the blade member 14 is attached to the hub member 10 the portions 18 of the blades are seated in the recesses 19 and the curved corner portion 20 of the ear creates a twist in the blade 15 and provides the necessary pitch for the blade. The tip portions of the blades 15 are preferably thinner than the central portion of the blade member.

It is evident that the hub member 10 may be formed of material other than rubber if it is so desired, and that different grades of rubber may be utilized for the hub member and for the blade member. The important consideration is that the blades shall be soft and flexible in order that they will not injure objects which may accidentally come in contact therewith.

In Fig. 5 I have illustrated a modified type of individual blade 21 which may be applied to the hub member 10. The blade 21 is moulded of soft flexible rubber and has a flat metal stiffening member 22 embedded therein provided with a spur 23 at one end thereof which projects outwardly through a face of the blade and is utilized to secure a portion 24 of the blade to an ear 13 in the recess 19 therein in lieu of a rivet. The blade 21 is also secured to the hub member 10 by a suitable adhesive applied to adjacent contacting surfaces of the blade and hub member. The member 22 acts to stiffen and shape that portion of the blade that is located adjacent to the hub member and where it is bent and formed around the ear 13.

In Fig. 6 I have illustrated another modified type of blade member 25. This blade member is of the same general shape as the blade illustrated in Fig. 3 but is cut from a single piece of soft, flexible sheet material, preferably rubber, and is of uniform thickness throughout. The blade

member 25 is attached to a hub member 10 by means of a suitable adhesive and by means of rivets or other fastening members which may be inserted through portions 26 of said blade member that are seated in the recesses 19 of the ears 13.

In Figs. 7 and 8 I have illustrated another modified embodiment of my invention in which a fan has a hub member 27 embodied therein preferably formed of moulded rubber flanged at 28 to provide ears 29 of substantially the same formation as the ears 13 previously described. Blades 30 illustrated in detail in Fig. 8 are moulded of soft flexible rubber or equivalent material and have a metal fastening and stiffening member 31 embedded therein provided with spurs 32. The blades 30 are secured to a face of the hub member 27 and to the ears 29 by means of a suitable adhesive and by means of the spurs 32 which are inserted through perforations 33 and 34 provided in the hub member and clinched against the surface of an annular groove 35 formed as a part of a cylindrical recess 36 which is utilized as the means for securing the fan to a rotary driving member as in the case of the fan illustrated in Fig. 1. The ears 29 are shaped to provide the necessary pitch for the blade 30 as is the case of the ears 13 previously described.

In Fig. 9 I have illustrated still another modified type of unitary blade structure 37 moulded in a single piece of soft, flexible rubber having stiffening members 38 embedded therein provided with spurs 39 which project outwardly through the material of the blade, said spurs being adapted to be inserted through a hub member and clinched thereagainst in a manner to firmly secure the blade member to the hub member. The member 38 acts to stiffen the blades when the latter are formed around the ears of a hub member.

It is evident that any number of ears 13 and 29, and any number of blades 15, 21 and 30 may be provided for the fans of this invention, and that the shape of the ears where the blades are bent or formed therearound will determine the pitch for said blades. It is also evident that a cheaper and possibly a harder grade of rubber may be utilized for the hub portions of the fans, while a better and a softer grade of rubber may be utilized for the blades.

I claim:

1. A fan comprising a hub member formed entirely of flexible rubber for expanded frictional application to a driving member, said hub having a plurality of ears formed integral therewith, and a plurality of soft flexible blades secured to said hub member and formed around said ears whereby said blades are twisted while being applied to the ears to provide a pitch therefor.

2. A fan comprising a hub member formed entirely of rubber and having a plurality of ears formed integral therewith, and a plurality of soft flexible blades constructed in one piece and secured to said hub member and formed around said ears whereby said blades are twisted automatically during assembly while being applied to the ears to provide a pitch therefor.

3. A fan comprising a hub member having a plurality of ears formed integral therewith, a plurality of soft flexible blades positioned against a face of said hub member and bent around said ears whereby said blades are twisted to provide a pitch therefor, and means moulded into said blades and projecting therefrom to secure the blades to said face of the hub member and to the ears thereof.

4. A fan comprising a hub member formed of moulded flexible material and having a plurality of ears moulded integrally therewith, a blade member having a plurality of blades embodied therein and formed as a single piece of soft flexible material positioned against a face of said hub member and formed around said ears whereby said blades are twisted automatically when applied to said ears to provide a pitch therefor, and means embedded in the blade member to secure said blade member to said hub member.

5. A fan comprising a hub member formed of a material having the characteristics of rubber and having a plurality of ears formed integral therewith, a plurality of soft flexible blades positioned against a face of said hub member and bent around said ears whereby said blades are twisted to provide a pitch therefor, and a flexible stiffening member embedded in said blades and having spurs projecting therefrom to secure the blades to a face of the hub member and to the ears thereof.

6. A fan comprising a hub member formed of moulded flexible material and having a plurality of ears formed integral therewith, a blade member having a plurality of blades embodied therein and formed as a single piece of soft flexible material positioned against a face of said hub member and formed around said ears whereby said blades are twisted to provide a pitch therefor, and means embedded in the blade member to stiffen the blades thereof adjacent to the hub member and secure said blade member to said hub member.

7. A fan comprising a hub member formed entirely of moulded rubber and having a plurality of ears formed integral therewith, said hub member being recessed for expanded frictional application to a driving member, and a plurality of blades of soft flexible rubber secured to said hub member, each blade being bent somewhat spirally upon itself around an ear while being applied thereto to provide a pitch therefor.

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