Nov. 18, 1930. E. SCHULTZ 1,781,960

COMBINED FAN AND PULLEY

Filed May 10, 1928

Fig. 1.

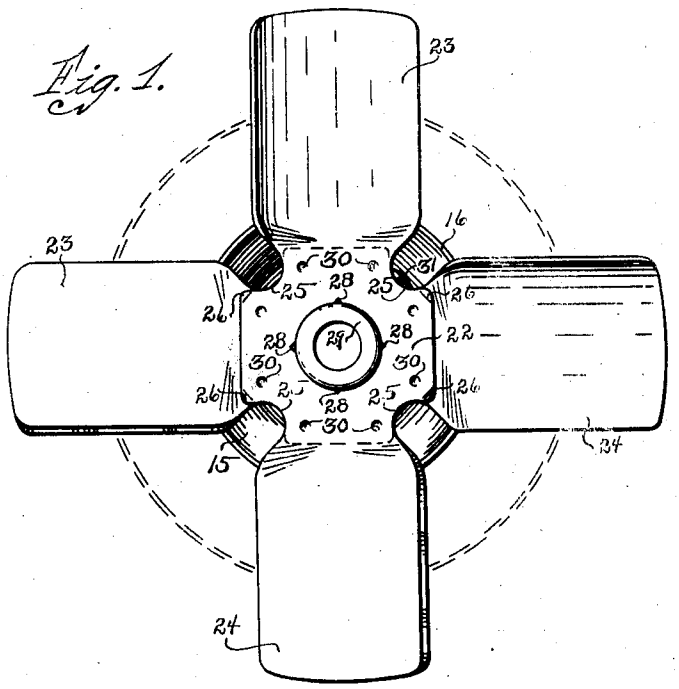


Fig. 2.

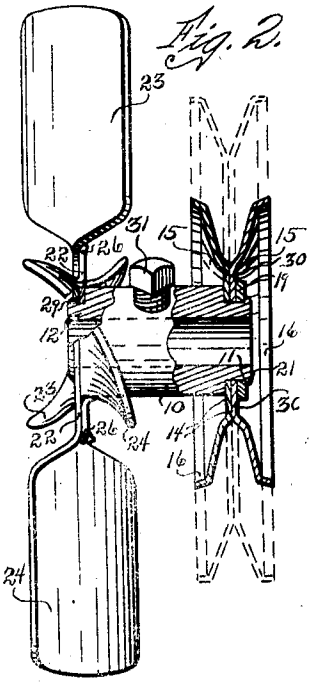


Fig. 3.

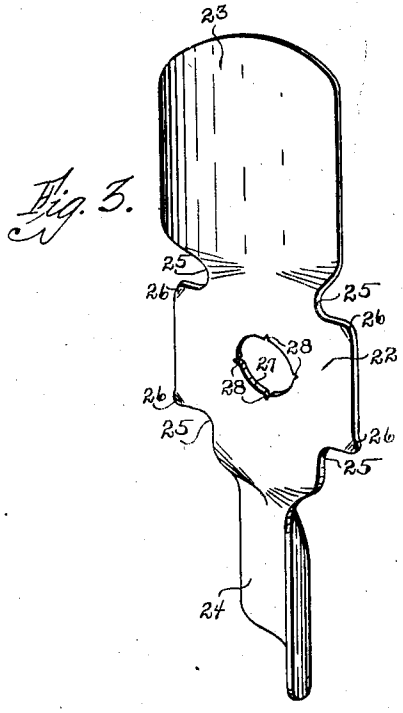
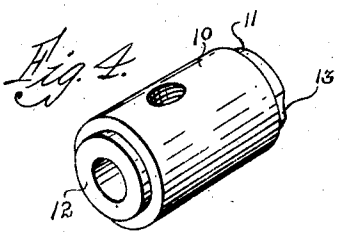


Fig. 4.



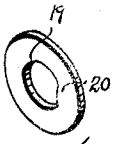


Fig. 6.

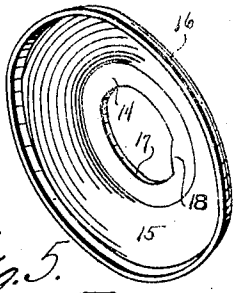


Fig. 5.

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Patented Nov. 18, 1930

1,781,960

UNITED STATES PATENT OFFICE

EDWARD SCHULTZ, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE NAGEL-CHASE MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

COMBINED FAN AND PULLEY

Application filed May 10, 1928. Serial No. 276,613.

The principal object of this invention is to provide a combined pulley and fan that may be easily secured on or detached from a shaft as a single unit.

A further object of my invention is to provide a combined fan and pulley that is economical in manufacture and durable in use.

A still further object is to provide a metal fan that is simple in construction and one that has blades that cannot easily be bent or distorted from their normal positions.

A still further object of this invention is to provide a combined fan and pulley that is of absolute uniformity and one that always runs true in operation, regardless of the load.

A still further object is to provide a combined fan and pulley that is light in weight and one that cannot be easily broken.

More specifically, the object of this invention is to provide a combined fan and pulley comprising a hub member having one of its ends secured to a steel stamped pulley composed of two identical shells and its opposite end secured to a steel stamped fan composed of two identical fan portions.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which:

Fig. 1 is a front view of my combined fan and pulley ready for use.

Fig. 2 is a side sectional view of the combined fan and pulley and more fully illustrates its construction.

Fig. 3 is a perspective view of one of the two duplicate fan portions before being assembled into a unit.

Fig. 4 is a perspective view of the cylindrical hub member before the fan and pulley have been secured to the same.

Fig. 5 is a perspective view of one of the shell members of the pulley stamped from one piece of sheet steel or other suitable material.

Fig. 6 is a perspective view of a washer used in securing the pulley to the hub member.

Belt driven fans and pulleys are a necessary part of many devices and machines now being placed on the market. The fan blades are usually cut from a single sheet of metal and riveted to a hub casting which makes them not only easily bent and broken, but cumbersome and inefficient in use. The usual method of installing them is to secure them to a rotatably mounted shaft upon which is also secured a cast iron pulley. Such a construction cannot possibly produce a uniform running assembly and therefore, lost power and rapidly wearing belts are experienced. I have overcome these disadvantages as will be appreciated by those familiar with the art by providing a durable steel stamped fan and pulley rigidly secured to a single hub member.

I have designated the cylindrical hub member of my device generally by the numeral 10, made of any suitable metal and designed to embrace in the common and well known manner, a shaft upon which the device is to be used. This hub member has its two ends reduced, as shown in Fig. 4 and designated by the numerals 11 and 12. The reduced end 11 has a flat face 13, the purpose of which will hereinafter be explained. The pulley used in my unit comprises two shell portions, which are exact duplicates of each other, stamped from one piece of sheet steel or other suitable material. By being exact duplicates, the requirement of two separate dies is eliminated, which reduces the manufacturing cost considerably and facilitates the assembling as well as standardizing the two parts and guaranteeing a true running pulley. I have designated the flat or base portion of each of the shell members by the numeral 14 at the outer edge of which is the flared portion 15 providing, when the backs of the two shells are secured together, the driving face. The peripheral flange 16 on each of the shells not only prevents sharp edges from damaging the belt running on the pulley, but also so strengthens the pulley that it is almost impossible to bend or otherwise distort the pulley from its normal shape.

Such a steel stamped pulley provides the combination of strength, light weight, low cost, and refined appearance that cannot possibly be equalled by cast iron pulleys. Another advantage of such a steel stamped pulley is its ability to reduce belt wear to a minimum, due to its smooth driving face and absence of sand or air holes, which is always present in cast iron. In assembling this portion of the device, two of the shell portions are placed with their backs together and the reduced end 11 of the hub member inserted through the hole 17 in each of the shell members, as shown in Fig. 2. On the marginal edge of each of the holes 17 is an inwardly extending segmental projection designed to engage the face 13 and thereby prevent any relative movement of the pulley to the hub 10. The washer 19 is next placed on the reduced end 11, which also has the segmental projection 20 engaging the face 13. The outer edge of the reduced end 11 is then hammered or otherwise spread to form the head 21 which permanently secures the pulley to the hub. The washer 19 engaging the outer face of one of the shell portions and the hub 10 engaging the outer face or the other shell portion, aid in providing an exceptionally rigid and well balanced pulley.

The two fan portions that make up my four bladed fan are also each a duplicate of the other, stamped from one piece of sheet steel or other suitable material and therefore do not require separate dies for each. This, like the one set of dies for the pulley, reduces the manufacturing cost and facilitates the assembling as well as guaranteeing a fan of even balance. I have designated the rectangular body portion of each of these fan portions by the numeral 22. Integrally formed on two opposite ends of this rectangular portion are the oppositely projecting fan blades 23 and 24. In order that the fan blades will be efficient their complete length, each fan has a cut away portion 25 on both side edges at a point where they are formed on the rectangular body portion, as shown in Fig. 3. To assemble the fan, the two fan portions are placed together as shown in Fig. 1. By this arrangement, the free ends of each of the rectangular members overlap the face of the fan blade adjacent to it at a point where fan blades are most subject to bending and breakage. This double corner makes an exceptionally sturdy fan that not only is hard to bend from its normal shape when struck by some resisting force, but maintains the correct angle of the blades when the fan is in operation. In other words, the fan will be as efficient when rotating at low speeds as when rotating at high speeds. The corners 26 of the rectangular body are also bent to engage and conform to the outline of the blade adjacent to them. The reduced end 12 is placed through the hole 27 of each of the fan portions. The numeral 28 designates small notches in the marginal edge of each of the holes 27 and when the reduced end 12 is hammered or otherwise spread to form the head 29, portions of the reduced end 12 will be pressed into these notches, which will prevent any relative movement of the fan to the hub 10.

Both of the fan portions and pulley portions may be spot welded, which is designated by the numeral 30. This assures no pulling apart of the portions and makes for a combined fan and pulley of long and efficient service. If the device is to be secured to a shaft, it may easily be done by merely tightening the single set screw 31 threaded into the hub 10.

The dotted lines in Fig. 1 and Fig. 2 show the position a larger pulley would occupy if substituted for the smaller one as shown in the drawings.

Some changes may be made in the construction and arrangement of my improved fan and pulley without departing from the real spirit and purpose of my invention and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In a device of the class described, two duplicate parts, each comprising a rectangular body portion, a fan blade formed on two opposite sides of said body portion, each having a width at a point where it joins said body portion less than the edge of said body portion to which it is formed; said part so proportioned that when the two duplicate parts are placed together the remaining sides of the rectangular body portions without fan blades formed on them, each overlap and strengthen a portion of the fan blade adjacent to it.

2. In a device of the class described, a fan of two parts, each comprising a rectangular body portion, a curved fan blade integrally formed on two opposite sides of said body portion, each having a width at the point where it joins said body portion less than the width of the side of said body portion to which it is secured, said two parts so designed that when they are placed together, the corner of each of the rectangular portions conform to and engage the curved portion of the blade adjacent to it, and a means for rigidly securing said corners to said blades.

3. In a device of the class described, a hub member having a reduced end, a fan of two parts, each comprising a rectangular body portion having a hole near its center and embracing said reduced end, a curved fan blade integrally formed on two opposite sides of said body portion, a cut-away portion in each of said side edges in each blade at a point where it joins the body portion; said

parts so designed that when they are placed together on said reduced end and the corner of each of the rectangular portion conforms to and engages the curved portion of the blade adjacent to it, and a means for securing said two parts on said reduced end and preventing independent rotation of said two parts.

4. In a device of the class described, two duplicate parts each comprising a rectangular body portion having two long sides and two short sides, a fan blade integrally formed on each of the two long sides; said two parts so designed and proportioned that when they are placed together that each short side completely overlaps and strengthens the root portion of the fan blade adjacent to it.

5. In a device of the class described, two duplicate parts each comprising a rectangular body portion having two long sides and two short sides, a fan blade integrally formed on each of the two long sides having its root portion of the same width as the width of the short sides of said body portions; said two duplicate parts so designed that when they are placed together to make a fan the short sides of the same each completely over-lap and strengthen the root portion of the fan blade adjacent to it.

6. In a device of the class described, two duplicate parts each comprising a rectangular body portion having two long sides and two short sides, a fan blade integrally formed on each of the two long sides having its root portion of the same width as the width of the short sides of said body portions; said two duplicate parts so designed that when they are placed together to make a fan the short sides of the same each completely over-lap and strengthen the root portion of the fan blade adjacent to it, and a means for securing said two duplicate parts together.

EDWARD SCHULTZ.