Dec. 18, 1951 M. C. McDERMENT 2,579,119

AIR IMPELLER

Filed March 2, 1950

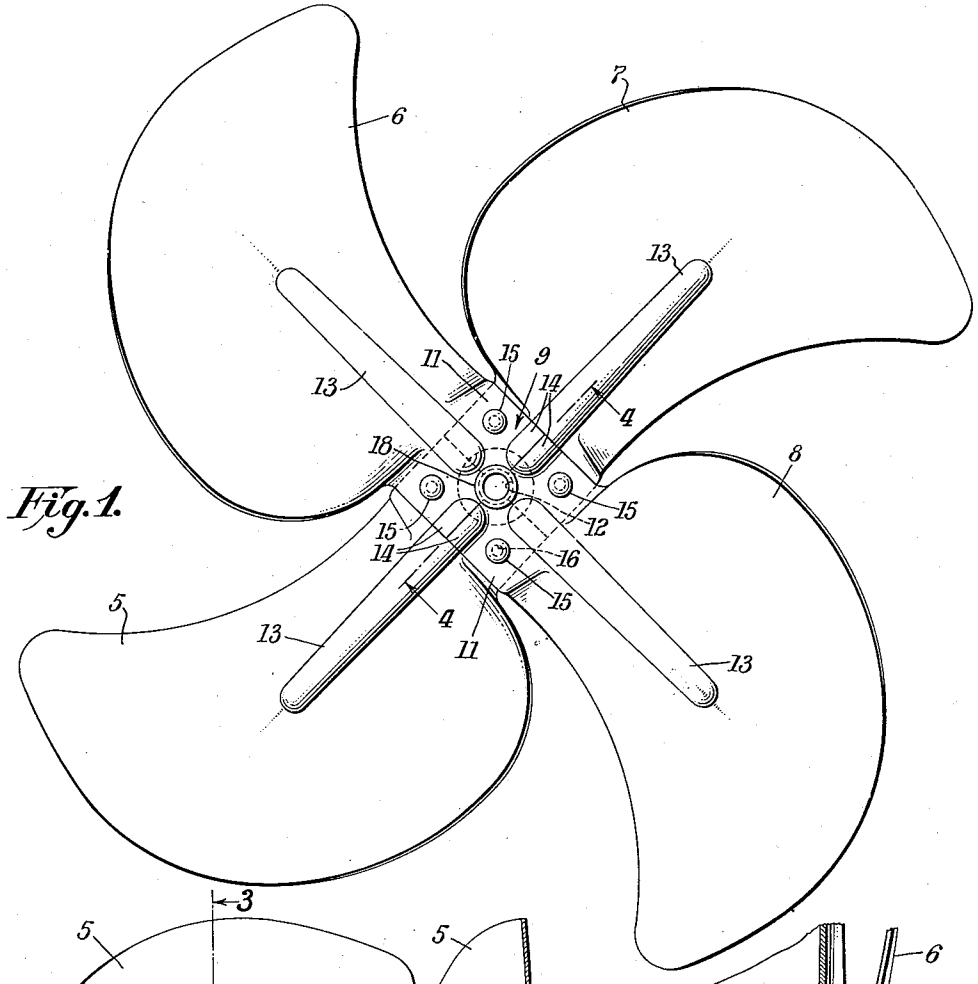


Fig. 1.

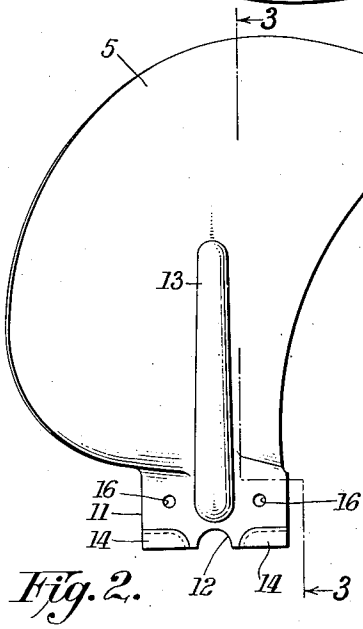


Fig. 2.

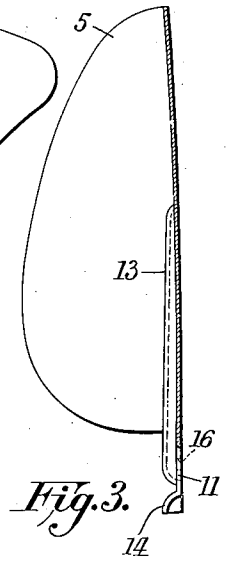


Fig. 3.

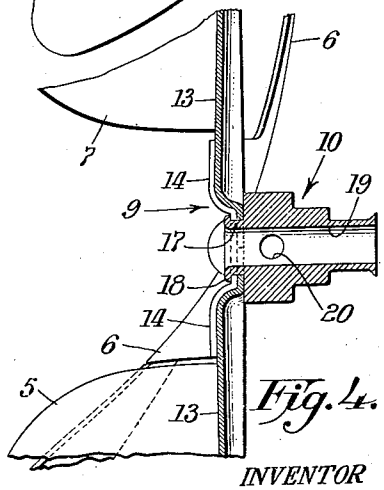


Fig. 4.

INVENTOR

Matthew C. McDerment

BY William P. Stewart

ATTORNEY

Patented Dec. 18, 1951

2,579,119

UNITED STATES PATENT OFFICE

2,579,119

AIR IMPELLER

Matthew C. McDerment, Elizabeth, N. J., assignor to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Application March 2, 1950, Serial No. 147,193

2 Claims. (Cl. 170—173)

1

This invention relates to propeller type fan blades suitable for use in free air fans such as are employed in the household and in the office. More specifically, this invention relates to a novel construction of an air impeller comprising four individual blade elements, the inner end portions of which are secured together thereby to form a unitary impeller having a rigid hub portion.

A primary object of my invention is to provide an impeller of the above noted type which will be economical of manufacture and at the same time will present a dynamically balanced structure which will produce a minimum of noise and vibration during its operation.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings,

Fig. 1 represents a front elevation view of my improved air impeller.

Fig. 2 represents a front elevation view of one of the four identical blades which make up the air impeller proper.

Fig. 3 represents a sectional view taken substantially along the line 3—3 of Fig. 2.

Fig. 4 represents, on an enlarged scale, a fragmentary sectional view taken substantially along the line 4—4 of Fig. 1.

In the embodiment illustrated, and referring to the numerals of the drawings, my improved impeller comprises four identically shaped individual wings, or blades, generally designated by the numerals 5, 6, 7 and 8, which blades are secured together at their inner end portions thereby to form a central hub structure 9 which is carried upon a hollow hub sleeve 10. The outer air-impelling surfaces of the blades may be of any conventional shape.

Each of the blades 5, 6, 7 and 8, may be formed of any suitable material, but in a preferred form of the invention they are fabricated of sheet metal. Since all of the blades are identical in shape, they may each be formed from a single die set when they are to be fabricated from sheet metal.

Each of the present blades is provided at its inner end with a flat and substantially rectangular terminal ear 11 which is provided centrally of its marginal edge portion with a semicircular

2

notch 12. Also, each blade is formed with a radially disposed rib or nodule 13 extending from a location adjacent the notch 12 to a location substantially midway between the inner and outer end portions of the blade for the purpose of strengthening the same. The terminal ear 11 of each blade is formed along its marginal edge portion at each side of the notch 12 with a curved flange or nodule 14 shaped as one-half of a rib section which is disposed at right angles to the radial blade rib 13.

In constructing the complete impeller structure, the terminal ear portions 11—11 are abutted in pairs and then the two pairs are stacked together in a manner such that the ear notches 12—12 will define a central hub aperture, and the abutting ear flanges 14—14 of half ribs will form complete short ribs which will nest with the corresponding radial wing ribs. To complete the impeller unit, the stacked ears 11—11 are secured together by a plurality of rivets 15 which pass through suitable apertures 16, and the reduced shoulder portion 17 of the centrally apertured hub element 10 is inserted into the hub aperture and spun over, as at 18, against one face of the impeller hub, thereby locking the impeller unit to the hub element. The hub element 10, being provided with a central aperture 19 and a threaded radial aperture 20, may be mounted upon the exposed portion of an impeller-actuating shaft and locked on such shaft by means of a set screw received within the threaded aperture 20.

Those skilled in the art will readily appreciate that the nested rib structure of the present impeller unit facilitates the accurate assembly of the individual blades and at the same time strengthens the hub section and locks the various blades against relative rotation. Furthermore, since all of the blades are identical in shape and are mounted together in a symmetrical fashion, there is automatically produced an impeller unit which is dynamically balanced so that it has little or no tendency to produce vibration and noise during its operation.

Having thus set forth the nature of the invention, what I claim herein is:

1. An air impeller comprising, four blades each having an outer air-impelling portion and an inner rectangular terminal ear portion being formed with a substantially straight marginal edge, a rib formed on and longitudinally of each blade and extending from a location adjacent said straight marginal edge of said ear to a location intermediate the inner and outer end por-

tions of the blade, a curved flange shaped as one-half of a rib section formed on the said marginal edge of each blade and disposed at right angles to said longitudinal rib, said blades being abutted in pairs at the said marginal edges of their terminal ears and having the two pairs of blades stacked together with the abutting ear flanges forming a complete rib which nests with a corresponding longitudinal rib, and means securing said blades rigidly together in such stacked relation.

2. An air impeller comprising, four blades each having an outer air-impelling portion and an inner rectangular terminal ear portion being formed centrally of its marginal edge with a semicircular notch, a rib formed on and longitudinally of each blade and extending from a location adjacent the notch to a location intermediate the inner and outer end portions of the blade, a curved flange shaped as one-half of a rib section formed on the said marginal edge of each blade at each side of the notch and disposed at right angles to said longitudinal rib, said blades being abutted in pairs at the said

marginal edges of their terminal ears and having the two pairs of blades stacked together in a manner such that the ear notches define a central hub aperture and the abutting ear flanges form complete short ribs which nest with the corresponding longitudinal ribs, and means securing such blades rigidly together in such stacked relation.

MATTHEW C. McDERMENT.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,121,335	Dilg	Dec. 15, 1914
1,260,562	McIntosh	Mar. 26, 1918
1,771,365	Woll	July 22, 1930

FOREIGN PATENTS

Number	Country	Date
127,627	Great Britain	June 12, 1919