July 24, 1951 J. C. BUSQUET 2,561,840

CENTRIFUGAL FAN

Filed June 5, 1946

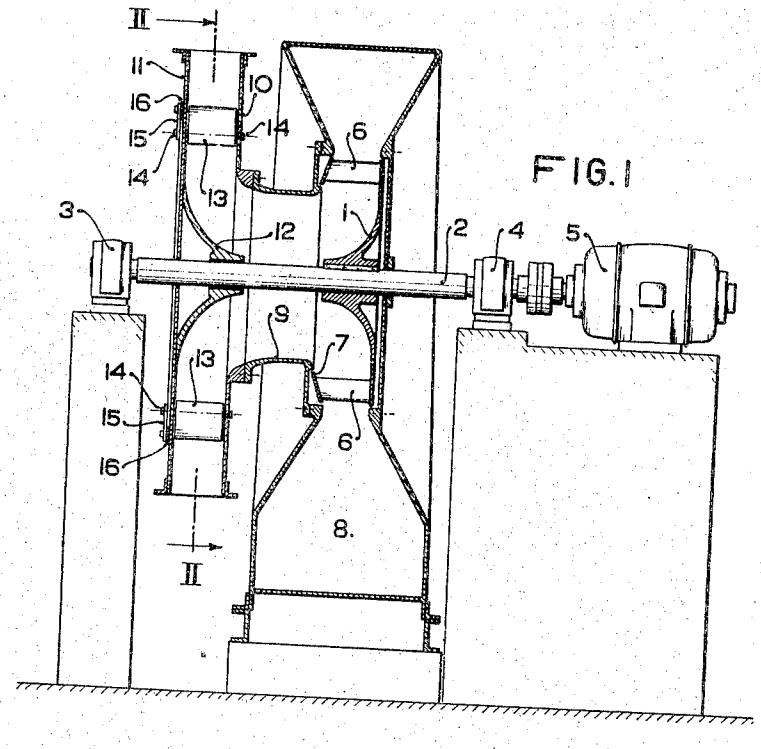


FIG. 1

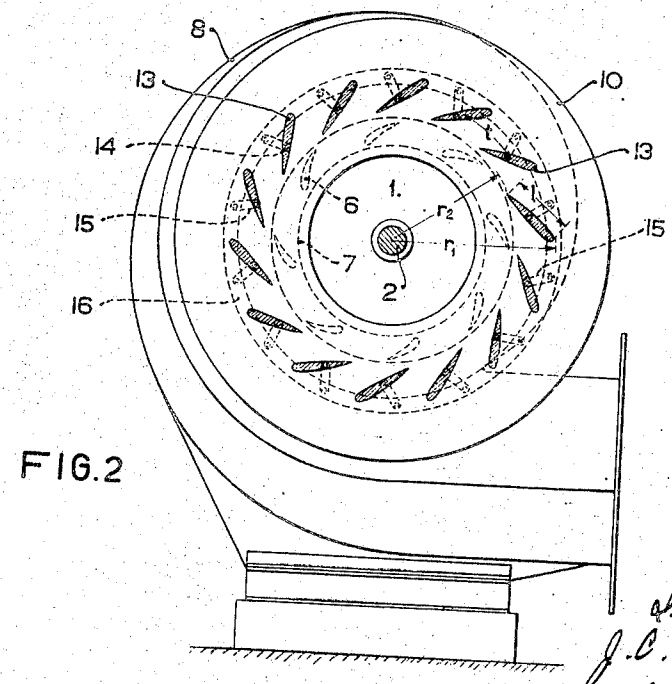


FIG. 2

Inventor:
J. C. Busquet
By E. F. Kenderdine
Atty

Patented July 24, 1951

2,561,840

UNITED STATES PATENT OFFICE

2,561,840

CENTRIFUGAL FAN

Jan C. Busquet, Hengelo, Netherlands, assignor to Machinefabriek Gebr. Stork & Co. N. V., Hengelo, Netherlands, a company of the Netherlands

Application June 5, 1946, Serial No. 674,560
In the Netherlands April 9, 1940

Section 1, Public Law 690, August 8, 1946
Patent expires April 9, 1960

1 Claim. (Cl. 230—114)

1

This invention relates to a centrifugal fan in which the fluid to be propelled enters the impeller centrally at one or both sides thereof and the inlet branch or branches of the fan casing being provided with a set of guide blades which are adjustable in such a manner that the passage area between said blades may be varied.

As in centrifugal fans of this kind the adjustable guide blades in a more closed position impart a greater swirl to the incoming air than in a more open position the blades should have a different shape for each position of adjustment. The entrance part of the blades must always be radially directed whereas their outlet portion at full load should be radially and at zero load should be tangentially directed, so that in said first case the blades have to be straight throughout their length and in said second case must be bent across an angle of 90°. In practice, therefore, an intermediate form between both said blade-forms is chosen, which is slightly curved and is the exact shape of the blades for one position of adjustment only.

In order to avoid said drawback and to obtain greater efficiency in connection with the deflection of the flow of the fluid in the guide apparatus according to the invention the adjustable guide blades as well as the impeller blades are of aerofoil form.

The invention will be described with reference to the accompanying drawings, Fig. 1 of which shows a longitudinal section of a fan according to the invention and Fig. 2 of which is a cross section taken on line II—II of Fig. 1.

The impeller 1 is keyed to the shaft 2 which is supported in bearing 3, 4 and is driven by an electric motor 5 directly coupled therewith. The impeller has eight blades 6 of aerofoil section which are welded to the backwall of the impeller and a supporting ring 7.

As appears from Fig. 2 the length of the blades 6 is considerably smaller than their mean pitch and the blades are relatively thick.

The casing 8 of the fan is provided with a cylindrical inlet branch 9 to which a wall 10 is secured extending perpendicularly to the impeller shaft 2. Parallel to the wall 10 a wall 11 is provided which carries a cone-shaped piece 12 bounding the guide channel formed between the walls 10, 11 and merging said channel into the axial portion 9 of the inlet branch of the fan casing. Between the walls 10, 11 guide blades 13 are pivotally mounted by means of trunnions 14.

The trunnions 14 projecting out of the wall 11 each carry an arm 15 connected to a ring 16 so that upon rotation of said ring the blades 13 are adjusted about an axis extending parallel to the impeller shaft 2 and the passage area between the blades is varied.

2

As shown in Fig. 2 the guide blades 13 on both sides are bounded by convex faces. The length l of the blades 13 is nearly equal to their mean pitch measured at the mean radius

$$\frac{r_1+r_2}{2}$$

in which r_1 denotes the largest radius and r_2 is the smallest radius of the rim of blades. The blades 13 are relatively thick and their greatest thickness is at least 10% of their length l. Said form of the blades presents the advantage that the flow of the fluid not under any condition is released from the blade surface so that a very favourable efficiency is obtained.

The invention may also be applied to a fan in which the fluid enters at both sides and which has a set of adjustable guide blades in each inlet branch.

What I claim is:

A centrifugal fan comprising a fan casing, a rotatable shaft journalled in said casing, an impeller secured to said shaft in said casing and having a backwall, a supporting ring in said casing, a series of impeller blades secured to said backwall and said supporting ring adjacent the periphery of said impeller, a cylindrical member secured to said casing providing an inlet branch to said impeller centrally thereof, a first wall secured to said cylindrical member perpendicular to said rotatable shaft, a second wall spaced from said first wall and forming therewith a guide channel, guide blades adjustably mounted between said walls and attaching said walls together, a cone shaped member secured to said second wall and merging said guide channel into said inlet branch of said casing, said impeller blades and said guide blades being of aerofoil form.

JAN C. BUSQUET.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
Re. 20,394	Anderson	June 8, 1937
1,892,303	Hagen	Dec. 27, 1932
1,906,180	Reese	Apr. 25, 1933
1,978,129	Downs	Oct. 23, 1934
1,997,506	Adamcikas et al.	Apr. 9, 1935
2,201,437	Kice	May 21, 1940

FOREIGN PATENTS

Number	Country	Date
302,953	Great Britain	Dec. 21, 1928