Nov. 15, 1927. 1,649,161

J. E. FOSTER

FAN

Filed Jan. 14, 1927

Fig. 1.

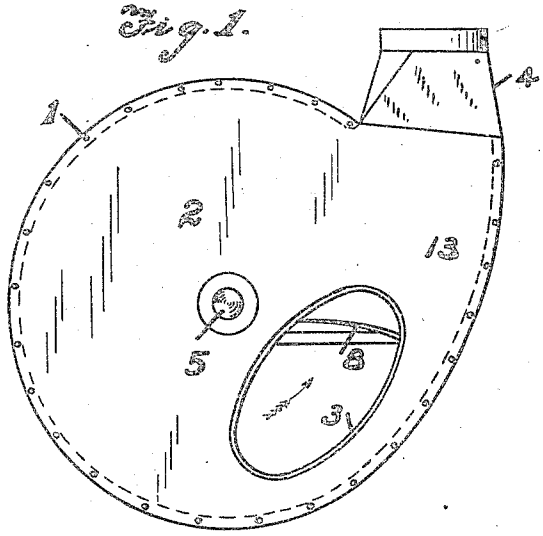


Fig. 4.

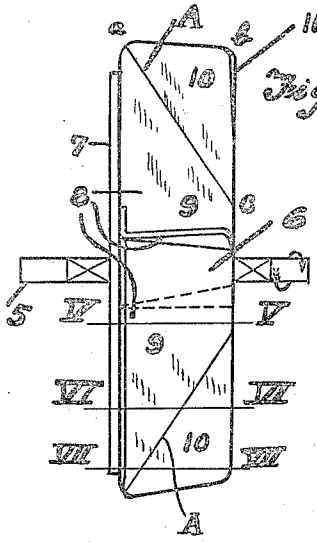


Fig. 2.

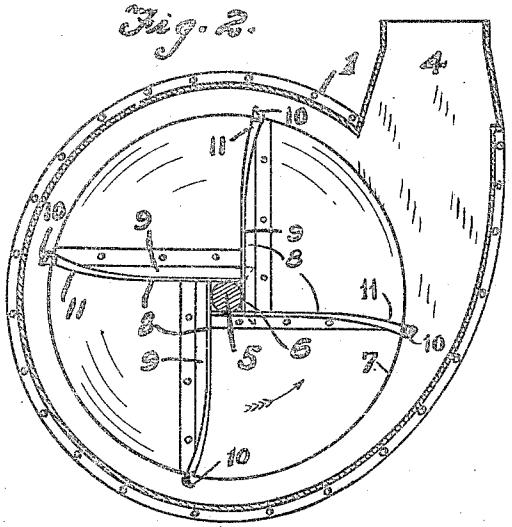
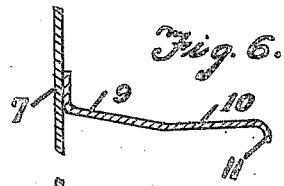


Fig. 6.



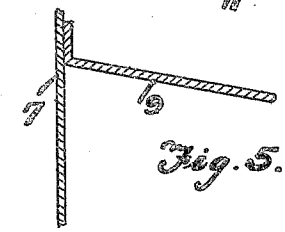


Fig. 5.

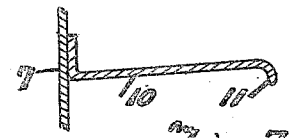


Fig. 7.

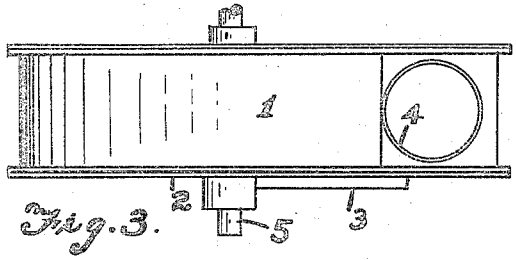


Fig. 3.

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Patented Nov. 15, 1927.

1,649,161

UNITED STATES PATENT OFFICE.

JAMES E. FOSTER, OF CLARKSBURG, ONTARIO, CANADA.

FAN.

Application filed January 14, 1927, Serial No. 161,090, and in Canada January 21, 1926.

The invention relates to improvements in fans as described in the present specification and shown in the accompanying drawings which form part of the same.

Whilst the invention appertains more particularly to fans for pneumatic stackers of grain separators, it might equally well be employed for fans used for other purposes.

In a patent granted to me Number 1,149,904 for a blower fan dated August 10th, 1915, I disclosed a fan which I termed a non-centre suction fan, which was provided with an inlet situated to one side of the impeller axis, the blades of which impeller radiated from a tapering hub; the face of each blade inclined forwardly in order to produce axial and radial suction.

In practice it has been found that this fan is possessed of very considerable lifting power in comparison with the small ratio of driving force consumed.

Furthermore, in addition to its other uses of general utility, this fan has been found to be particularly adaptable for the handling of grain since it does not destroy or in any way injure the same on account of the blades never actually contacting or striking the grain whilst it is passing through the fan; again, in handling straw and hay it has been demonstrated in actual practice that commodities of this nature will not tend to choke or clog the fan as has been experienced with fans of other designs.

However, by reason of the forward inclination of its blades, as shown in the aforesaid patent, a tendency has manifested itself to concentrate the material being delivered, this being consequent upon the fan's failure to spread the material uniformly as it passes through the outlet duct.

The main object of the present invention, therefore, is to provide for the uniform distribution of whatsoever material this fan may be engaged in handling.

Referring to the drawings, Figure 1 is a side elevation of the fan depicting its inlet side.

Figure 2 is a vertical sectional view of the fan.

Figure 3 is a plan view thereof.

Figure 4 is a side elevation of the fan wheel removed from the casing.

Figure 5 is a transverse sectional view of one of the blades taken on the line 5—5 of Figure 4.

Figure 6 is a further sectional view of the blade taken on the line 6—6 of the same figure.

Figure 7 is a still further sectional view taken on the line 7—7 of such figure.

Like numerals of reference indicate corresponding parts in each figure throughout the drawings.

In the drawings, the reference numeral 1 indicates generally the fan casing which has an inlet side 2 removable as customary in fan construction.

On one side of this impeller axis is the segmental inlet 3 and slightly beyond this inlet is the outlet duct 4.

The fan wheel comprises a shaft 5 carrying a tapering hub 6 in the form of the frustrum of a cone, the base of which rests against a substantial disk 7.

Radiating from the hub at a tangent therefrom are a plurality of fan blades 8, these blades being forwardly inclined so as to form an acute angle with the disk 7, the forward inclination of the blades inducing axial suction in order to force the material as it is drawn through the inlet 3 against, or in the region of, the disk 7, thus exhibiting a decided tendency to crowd or concentrate it thereabout as heretofore recounted; to overcome which the present invention provides for the bending of the outer part of each blade backwardly so as to offset its forward inclination.

It is preferred to bend the blades backwardly from a diagonal line A, shown in Figure 4 of the drawings, so as to divide each blade into a pair of approximate triangles, the inner triangular portion retaining its forward inclination, while the outer triangular portion is the one which is bent backwardly.

In the drawings, the reference numeral 9 represents the inner triangular, or forwardly inclined, and 10 the outer, or backwardly inclined, piece. In the same figure the upper blade shows its outer portion 10 outlined by the characters *a*, *b* and *c*, thus clearly defining the triangular formation in question. 11 indicates the forwardly turned flange of the blade.

Whereas it is preferable to bend the blades triangularly as recounted, it will be clearly evident that this is purely a matter of choice and that the invention is not confined in this regard as to shape.

Having now described the preferred form of the invention capable of carrying the

same into practical operation, it is understood that changes in shape and general assemblage of the parts may be resorted to without departing from the spirit and scope of the invention, and the right is accordingly reserved by the inventor of making such changes and modifications as may fairly come within the spirit of his invention and the claims hereinafter following.

What I claim is:—

1. In a fan of the class described, a fan wheel having a substantial portion of each blade forwardly inclined at an angle to the axis of rofation and the remainder backwardly inclined with respect to said forward inclination substantially the full width of the outer portion of each blade.

2. In a fan of the class described. a fan wheel having the major portion of each blade forwardly inclined at an angle to the axis of rotation and the minor portion thereof bent oppositely in said forward inclination to offset said forward inclination of the blades.

3. In a fan of the class described, a fan wheel having the major portion of each blade forwardly inclined at an angle to the axis of rotation and the minor portion thereof bent oppositely in said forward inclination to offset said forward inclination of the blades, said oppositely bent portion of the blade being located at the outer end of the fan wheel.

4. In a fan of the class described, a fan wheel comprising a tapering hub, blades radiating therefrom, the said blades being substantially inclined forwardly at an angle to the axis of rotation and being oppositely bent in said forward inclination at their outer ends.

5. In a fan of the class described, a fan wheel comprising a tapering hub, a disc at right angles thereto, blades tangentially radiating from said hub and attached at their rear edges to said disc, said blades forwardly inclining at an angle to the axis of rotation and having their outer ends bent rearwardly at a slight angle to their forward inclination.

6. In a fan of the class described, a fan wheel comprising a tapering hub, a disc at right angles thereto, blades tangentially radiating from said hub and attached at their rear edges to said disc, said blades forwardly inclining at an angle to the axis of rotation and having their outer ends bent rearwardly on an oblique line.

7. In a fan of the class described, a fan wheel comprising a tapering hub, a disc at right angles thereto, blades tangentially radiating from said hub and attached at their rear edges to said disc, said blades forwardly inclining at an angle to the axis of rotation and having their outer ends bent rearwarldy at a slight angle to their forward inclination, the frontal edges of said blades being forwardly curved.

Signed at Toronto, Canada, this twelfth (12th) day of January, 1927.

JAMES E. FOSTER.