Aug. 2, 1955 A. D. GOETTL 2,714,485

BLOWER ROTOR CONSTRUCTION

Filed June 28, 1951

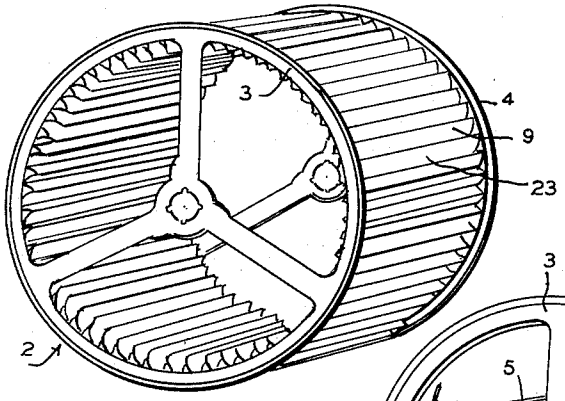


FIG. 1.

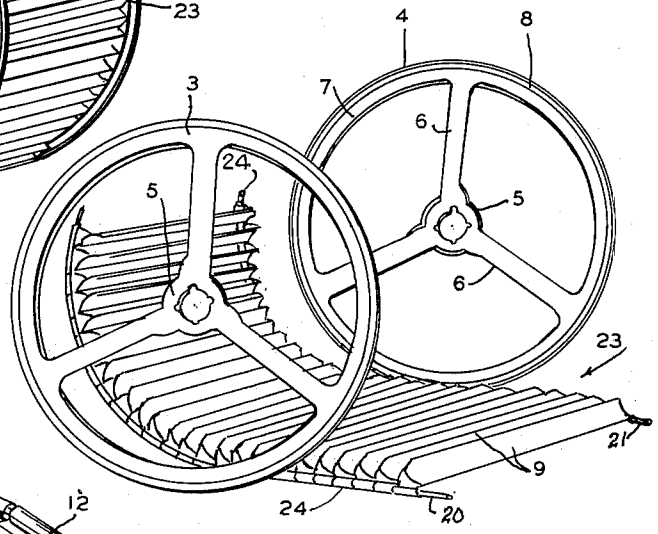


FIG. 2.

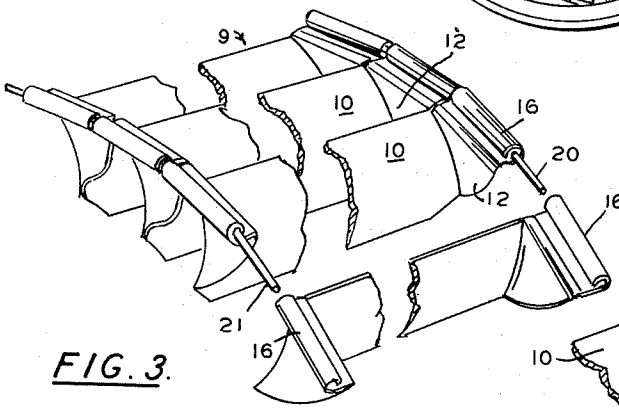


FIG. 3.

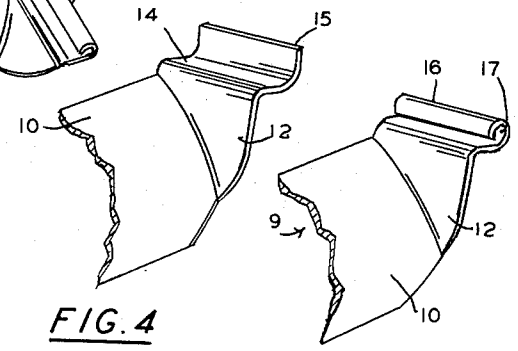


FIG. 4

FIG. 5.

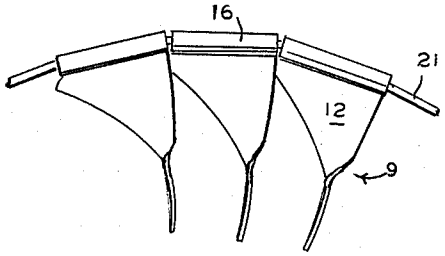


FIG. 6.

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2,714,485

Patented Aug. 2, 1955

2,714,485

BLOWER ROTOR CONSTRUCTION

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Application June 28, 1951, Serial No. 234,001

4 Claims. (Cl. 230—134)

This invention pertains to the construction of rotors for blowers commonly used in cooling and ventilating apparatus.

One of the objects of the invention is to provide a structure composed of end pieces and a blade element arranged so that the blade element can be formed into a substantially cylindrical shape which will include a plurality of fan blades and to which the end pieces can be quickly and accurately applied.

A second object is to provide a composite structure which can be formed into a blower rotor by a simple curling, rolling and beading process and will produce thereby a substantial blower rotor having a large number of axially parallel blades accurately spaced and positioned at the correct angle to secure optimum results when applied to a properly fitting blower casing.

Another object is to provide a blank which may be formed by a stamping process to provide a blower rotor blade which may be attached to wires at each end and thereby form a structure which may be rolled into a cylindrical shape and applied to end pieces and attached thereto by a simple beading operation.

A still further object is to provide a form and shape for blower rotor blades which may be attached together chainwise by tabs properly formed on each blade by spot welding; these blade units being arranged so that when assembled the blades may be formed into a cylindrical form and attached to rotor end pieces by a simple rolling and beading structure.

Other objects will appear hereinafter.

I obtain the foregoing objects by means of the devices, and the particular construction and shaping the individual parts and the composite structure shown in the accompanying drawings in which—

Figure 1 is a perspective view of a blower rotor made according to my invention and embodying the features of my improved construction;

Figure 2 is an exploded view of the three main parts which compose the rotor;

Figure 3 is a fragment of the blower blade chain drawn on an enlarged scale.

Figure 4 is an end portion of one of the rotor blades as it appears in an intermediate stage of its forming, drawn on a further enlarged scale;

Figure 5 is a similar view of a blade end completely formed; and

Figure 6 is an end view of a portion of the rotor blade assembly drawn on substantially the same scale as Figure 3.

Similar numerals refer to similar parts in the several views.

As illustrated in Figures 1 through 6, the rotor consists generally of two end pieces, 3 and 4. These each have hub pieces 5 from which spokes 6 extend to rims 7.

The rims as first formed provide annular grooves 8 adjacent their peripheral edges and opening on their inner juxtaposed faces. The peripheral edges of each end piece rim are then beaded over, when the parts are

assembled, closing the grooves 8 on the edges 24 of the blade assembly.

The blades 9 are formed by a metal stamp to have a mid portion 10 which has the proper curvature for the type of fan rotor desired. At the ends of each blade there is a struck up portion 12 which lies in a radial plane relative to the axis of the rotor. The upper edge of this struck up portion is then bent outward at 14 as shown particularly in Figure 4, and an upwardly (or radially) extending tab 15 formed at its outer edge. A subsequent operation of the stamping die closes this tab to form the rolled bead 16, as shown particularly in Figure 5, which has a hollow tubular interior 17. This formation is made at each end of each blade 9.

Blades made according to this construction are then strung on wires 20 and 21 as shown in Figures 3 and 6 to form a composite louver-like structure 23. The rolled portion 16 at the end of each blade also acts as a spacer so that each blade is equally and properly spaced on each wire.

After a number of blades have been strung upon wires 21 and 22, an assembly of blades, indicated by numeral 23, is formed which has sufficient length to form a cylindrical structure having a diameter the same as that of the rims 7 of the end pieces 3, and such that beads 16 will fit into annular grooves 8 of rotor ends 3 and 4. In doing this the wires and blades are rolled to form a cylindrical-like structure and the edges 24 of this composite structure 23 including wires 20 and 21 within blade beads 16 are pressed into grooves 8 of the end pieces 3 and 4. The two rotor ends 3 and 4 are then held in place with the assembly 23 between them and the edges of grooves 8 rolled down so that they grip the edges 24 of the composite blade assembly 23. The result of the foregoing produces the rotor as shown in Figure 1.

The above described parts and assembled structure make it possible to stamp the blades, form and shape them, and then string them on the wires 20 and 21 in correct position so that they automatically assume the angular position desired when the assembly of blades 23 is rolled to the proper diameter. The individual positioning and spacing of blades by means of a jig, or otherwise, is thus eliminated and spot welding, or other fastening, such as riveting or the like, of the blade ends to the rotor is entirely eliminated. It is, therefore, possible to speed up assembly of blower rotors and produce a better product than has heretofore been made.

I claim:

1. A blower composed of circular end pieces of sheet metal having annular grooves adjacent their peripheral edges receiving and retaining the edges of an interpositioned substantially cylindrical blade assembly consisting of a plurality of blades extending parallel to the axis of said rotor, each having struck up end portions lying substantially in radial planes relative to the rotor axis; radial tabs at the ends of said struck up portions having rolled beads along the outer edges of said tabs, wires at each end extending through said beads at each end of each blade, and the edges of said blade assembly being retained in the annular grooves of said end pieces.

2. In the construction of blower rotors, the method of forming a cylindrical rotor consisting of, forming circular blower end pieces with annular grooves on their inner faces adjacent their peripheral edges forming individual rotor blades with beads roller at each end adapted to be pressed into said annular groove in said end pieces, stringing said end beads on assembly wires at each end to form a blade assembly; rolling said blade assembly to form a substantially cylindrical blade assembly and inserting the edges of said cylindrical blade assembly into the annular grooves in said end pieces; and

closing the edges of said annular grooves on to the blade beads along the edges of said blade assembly.

3. In the construction of blower rotors, the method of forming a composite cylindrical rotor by first, forming circular end pieces with inner and outer faces and annular grooves adjacent their peripheral edges on their inner faces; second, forming individual rotor blades with arcuate central portions, struck up portions at each end and rolled beads formed at the outer ends of said struck up portions to receive assembly wires; third, stringing said beads at each end of each of said blades on assembly wires forming a blade assembly; fourth, rolling said blade assembly into a substantially cylindrical blade assembly with each of its ends conforming to said annular grooves on said end pieces; and fifth, fitting the annular grooves on the inner faces of said end pieces on to the ends of said cylindrical blade assembly and rolling the peripheral edges of said annular grooves over the blade beads at the ends of said assembly.

4. A cylindrical blower rotor composed of circular end pieces having inner and outer faces and annular grooves on their inner faces adjacent their peripheral edges, in combination with a substantially cylindrical

blade assembly consisting of a plurality of blades, each having a central portion, struck up positioning end portions, beads at the ends of said struck up portions and circular assembly wires at the respective ends of each of said blades extending through the said beads; said blade assembly including its blade beads and the wires therein fitting into the annular grooves of said end pieces.

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