June 24, 1924.

1,498,790

E. R. FIELD

VACUUM CLEANER

Original Filed March 5, 1921

Fig. 1.

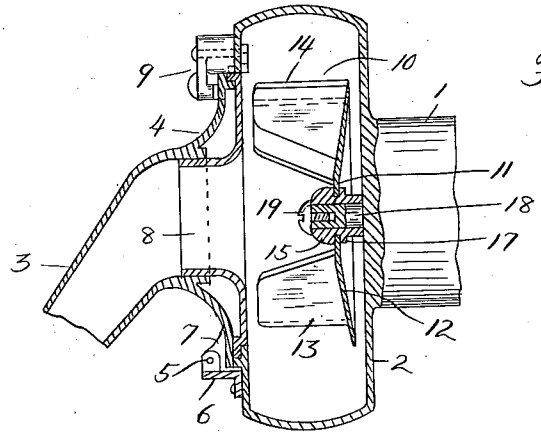


Fig. 2.

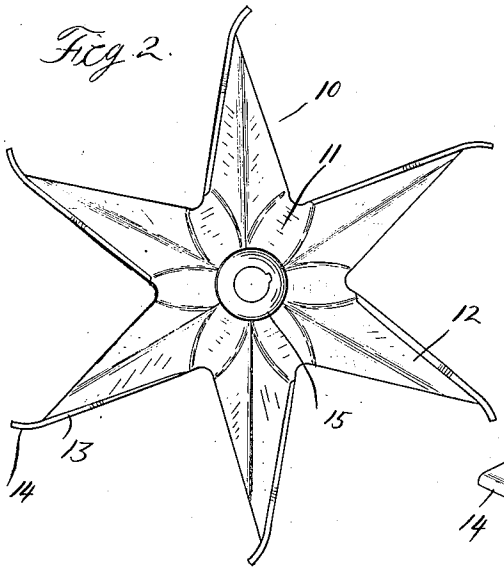
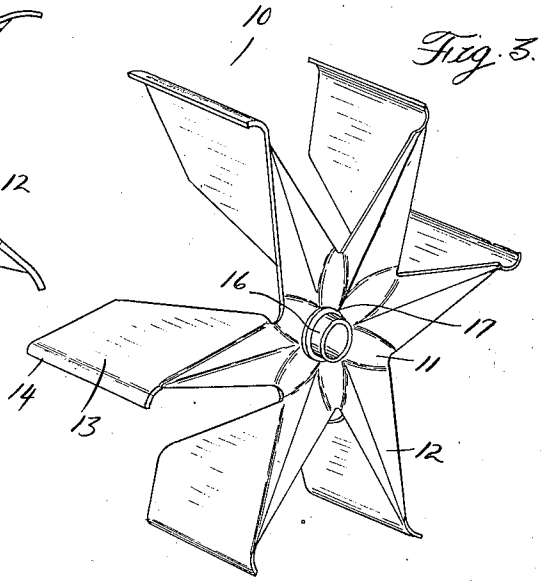


Fig. 3.



Inventor

Egbert R. Field

By Whittemore Hulbert Whittemore

& Belknap Attorneys

Patented June 24, 1924. 1,498,790

UNITED STATES PATENT OFFICE.

EGBERT R. FIELD, OF DETROIT, MICHIGAN, ASSIGNOR TO EUREKA VACUUM CLEANER COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

VACUUM CLEANER.

Original application filed March 5, 1921, Serial No. 449,779. Divided and this application filed June 27, 1921. Serial No. 480,704.

To all whom it may concern:

Be it known that I, EGBERT R. FIELD, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Vacuum Cleaners, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to vacuum cleaning apparatus and refers more particularly to the portable type which is provided with a suction tool directly connected to the fan casing.

The invention has for its object to provide an accurately balanced construction of fan to avoid vibration; and to provide a fan having a central portion into which the air is drawn through the registering inlet opening in the casing and which presents a large clearance so that comparatively large objects may be properly drawn through the fan casing. The invention has for other objects the novel features of construction and combinations and arrangements of parts as more fully hereinafter set forth.

In the drawings:—

Figure 1 is a vertical central section, partly in elevation, through a portion of a vacuum cleaner embodying my invention;

Figure 2 is a front elevation of the fan;

Figure 3 is a perspective view thereof.

This application is a division of my copending application Serial No. 449,779 filed March 5, 1921, upon vacuum cleaner.

The vacuum cleaner has the motor casing 1, the fan casing 2, and the suction tool 3. The suction tool has the cap 4 which is pivotally connected at its lower part to the fan casing 2 by the pin 5 engaging in cooperating brackets 6 and 7 respectively upon the fan casing and cap, the arrangement being such that the suction tool may be swung down to permit of engagement of another suction tool over the nipple 8 extending axially outward from the fan casing 2. To detachably hold the cap 4 against the fan casing, there is a suitable fastener 9 upon the fan casing.

It is very important to have an accurately balanced construction of fan to avoid vibration as well as striking of the fan against its casing. As shown my fan 10 is formed of one-piece and comprises the central circular web 11 registering with the nipple 8, 12 extending radially from the web and of progressively decreasing width from their inner to their outer ends, and the transverse flanges 13 extending from corresponding edges of the arms. These flanges are formed by bending and are of a width such that they substantially extend across the fan casing 2, and their inner edges are preferably inclined toward the arms and terminate near the points of intersection of the arms, so that a very large clearance space is secured in the fan in registration with the nipple 8. The outer ends of the flanges are preferably curved as at 14. This fan is preferably formed of a stamping and to reinforce the radial arms 12 they are longitudinally corrugated. The fan is tempered to make the same resilient as well as strong, so that upon striking an obstruction the parts may yield and after passing the obstruction will resume their normal positions.

The hub of the fan has the enlarged portion 15 abutting the outer side of the web 11 and the portion 16 of reduced diameter extending through the web. To secure this hub to the web, the portion 16 has its outer surface upset inwardly to form the integral flange 17 abutting the inner face of the web. The fan is keyed upon the motor shaft 18 and is secured from outward longitudinal movement by the screw 19 overlapping the outer end of the hub 13 and threadedly engaging in the outer end of the shaft 18.

From the above description, it will be seen that my fan, being of one-piece construction is simple, and furthermore, is more accurately balanced than those formed of a number of pieces, due to the fact that the thicknesses of the material forming the different pieces of a fan vary. In the present instance, this thickness of material is the same throughout since the blank is of comparatively small area. Furthermore, by having the air impelling flanges formed with their inner inclined edges terminating at the points of intersection of the arms, the maximum amount of clearance in the fan is obtained registering with the inlet nipple so that any bulky articles being drawn up through the suction tool will readily pass through the fan and its casing into the dust bag. Another very important

consideration is that the parts of the fan may yield upon striking some obstruction and after passing the same, return to their original positions, this being due to the fact that the fan is tempered and also made of one piece.

What I claim as my invention is:—

1. In a vacuum cleaner, the combination with a fan casing and an axial inlet opening, of a fan within said casing comprising a web in substantial registration with said inlet opening, radial arms extending from said web, and transverse flanges extending longitudinally of said arms, said transverse flanges extending across the fan casing and terminating short of one wall thereof, the inner edges of said transverse flanges being inclined toward the arms and terminating near the points of intersection of the arms whereby a relatively large clearance space is provided in the fan in registration with the inlet opening.

2. A fan for vacuum cleaners and the like comprising a hub, a web mounted on the hub, radially extending arms projecting from the web, and radially extending flanges projecting freely laterally from said arms whereby said flanges are free to yield when striking an obstruction, the outer peripheral edge of each flange being curved transversely toward the adjacent flange, the hub being formed of one metal and the flanges, arms and web being formed from one piece of light gauge tempered metal whereby the flanges will return to normal position after striking an obstruction.

3. A fan for vacuum cleaners and the like comprising a hub, a web mounted on the hub, radially extending arms projecting from the web, and radially extending flanges projecting freely laterally from said arms whereby said flanges are free to yield when striking an obstruction, the flanges, arms and web being formed from one piece of light gauge tempered metal whereby the flanges will return to normal position after striking an obstruction.

In testimony whereof I affix my signature.

EGBERT R. FIELD.