

July 17, 1956

A. P. DOUGLAS ET AL

2,755,015

PORTABLE FAN UNIT

Filed April 6, 1955

3 Sheets-Sheet 1

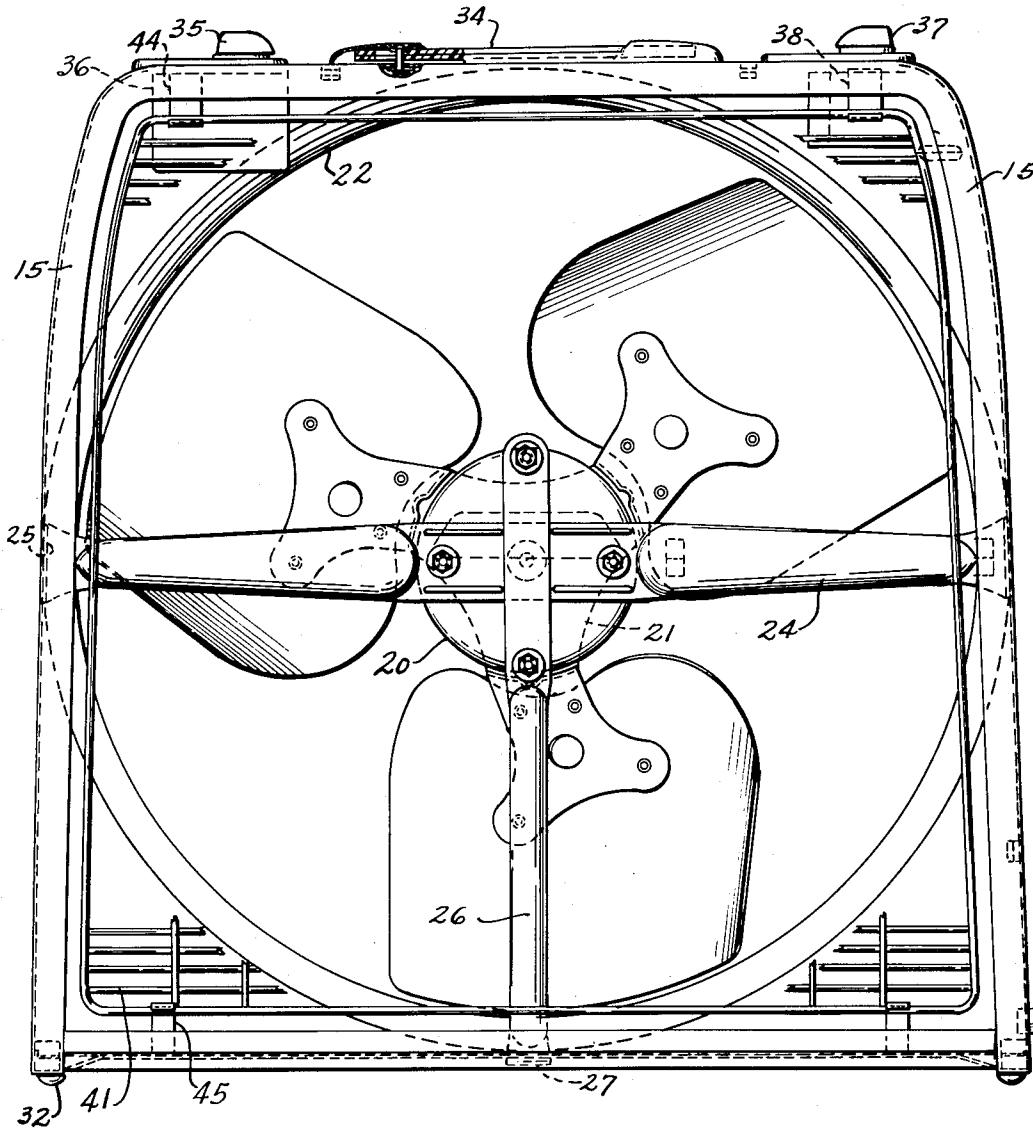


Fig. 1

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3 Sheets-Sheet 2

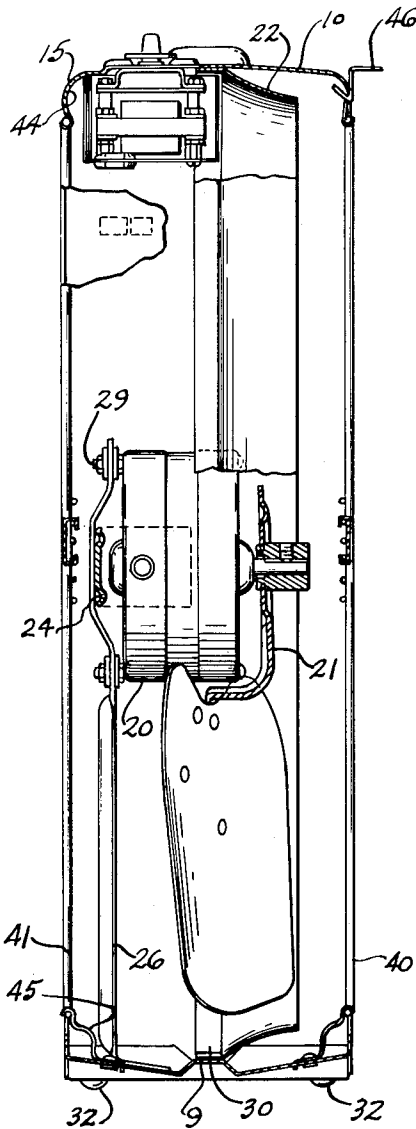


Fig. 2

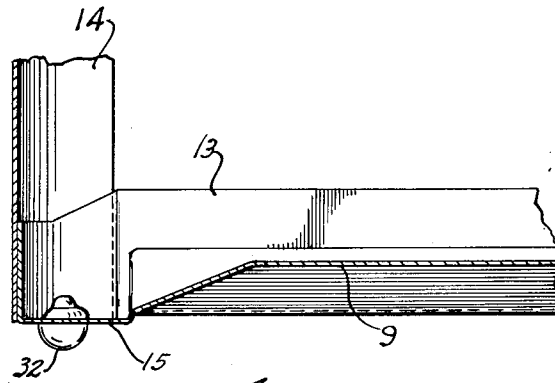


Fig. 4

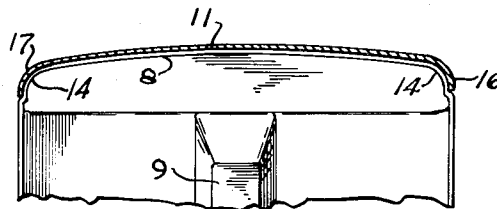


Fig. 5

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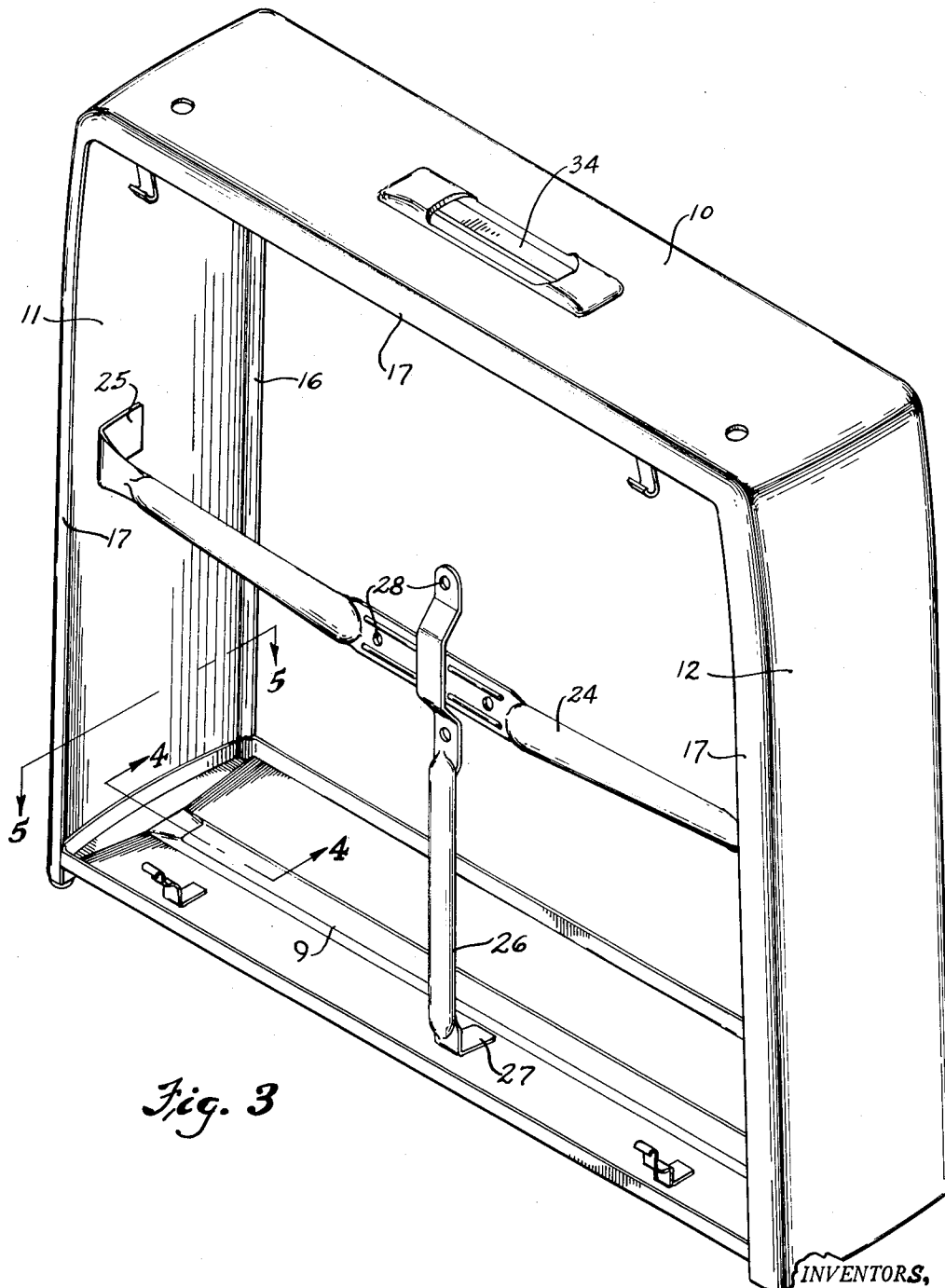


Fig. 3

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2,755,015

PORTABLE FAN UNIT

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Application April 6, 1955, Serial No. 499,685

11 Claims. (Cl. 230—117)

This invention is concerned with improvements in heavy duty portable motor-fan units and has for its general object the provision of a relatively light weight portable housing structure which will be sturdy and noiseless in use.

A more specific object of the present invention is the provision of a portable motor fan housing of the semi-venturi or bell mouth type.

A still further object is the provision of a housing which in contour may be readily portable so that the unit may serve as a window air ventilator or as an air circulator.

Other objects of the invention will be apparent from the following description referring to the accompanying drawings showing a preferred embodiment thereof. The essential characteristics of the invention are summarized in the claims.

In the drawings Fig. 1 is an elevational view of the portable unit;

Fig. 2 is a central cross sectional elevation of the unit;

Fig. 3 is a perspective view of the housing structure with the motor-fan unit and venturi elements omitted;

Fig. 4 is a cross sectional view of the bottom panel connection to a side wall of the housing taken along a plane indicated by the line 4—4 of Fig. 3; and

Fig. 5 is a cross sectional view taken along the line 5—5 of Fig. 3.

The present invention contemplates a portable housing structure which will have a maximum of stiffness and minimum weight whereby a heavy duty motor and fan may be noiselessly supported therein when the unit is hung on a frame supported in a window opening or when the unit is merely set on the floor in a room for air circulating purposes.

The construction of the housing is such that flat panel surfaces are avoided as a matter of noise prevention and sturdiness while maintaining an overall narrow construction for portability purposes. To this end the top wall 10 and side walls 11 and 12 are formed from an integral sheet of metal in the shape of an inverted U with the three walls crowned or arched outwardly. The front and rear marginal edges of the crowned walls terminate in continuous rounded flanges 16—17 which extend and terminate in vertical planes to define the inlet and outlet of the housing structure.

The housing structure is completed with a drawn sheet metal panel in the form of a pedestal having a continuous upwardly extending marginal flange formation crowned at the ends and rounded at the corners to be complementary to the cross sectional shape of the bottoms of the side walls 11 and 12 to which the flanges are attached in suitable manner such as spot welding. This connection is shown in Fig. 5 wherein the crowned side walls 11—12 fit the crowned end flange 8 and rounded corners 14 of the bottom panel 15. The rounded end flanges 16—17 of the side wall fit the rounded corners 14 of the bottom panel flange 8.

The bottom panel 15 has end pedestal formations and a centrally extending land 9 struck up which comprises

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a stiffening rib to prevent drum noises otherwise produced by the bottom panel and this rib also affords a land for one of four points of connection of a semi-venturi or bell mouth air tube 13.

The motor-fan unit 20—21 is suspended within an air tube 13 of the venturi formation by a three legged bracket structure consisting of a horizontally disposed bracket beam member 24 extending between the interior of the crowned side walls 11—12. This bracket member has securing pads 25 formed at the ends thereof which may be spot welded or riveted securely to the crowned side walls 11—12. A vertically extending column or bracket leg 26 has a foot 27 secured to the bottom panel and the legs of the bracket structure have bolt hole openings 28 through which extend sound or vibration insulator sleeves and the motor casing bolts 29.

As will be observed the side walls of the housing slope slightly outwardly from top to bottom but it will be noted by observing the circular air tube that the distance between the top and the bottom panel land 9 relative to the motor center are equal and the distance between the feet 25 of bracket 24 and the motor center are equal. Thus the air tube cylindrical part 30 is tangential to these points thus affording four equally spaced tangential points of connection between the housing structure and the bell mouth air duct.

As shown in Fig. 4 the central land rib 9 of the bottom panel does not extend completely across the bottom panel and the end regions of the bottom panel from pedestals 15 for the portable housing. The bottom panel is perforated at these pedestal formations adjacent the rounded corners 14 to receive and retain rubber buttons or cushions 32.

A leather handle 34 for carrying the unit about is attached to the top wall 10 of the housing structure in a suitable manner.

The disclosed fan motor 20 is of the shaded pole type and a manual switch 35 and starting mechanism 36 are mounted on the top wall 10 at one side of the handle structure. At the other side of the handle structure are mounted a manually settable timer handle 37 and timer mechanism 38. Both electrical mechanisms are disposed beneath the top wall 10 and are supported thereby in the top region of the housing structure. The wiring connections between these mechanisms and between them and the motor are not shown but may be clipped to the inner faces of the housing walls and to the bracket beam 24.

The front and the rear openings of the housing structure are closed by grill panels 40—41 that are held suspended substantially in the planes of the terminal edges of the rounded margins of the housing members 10—11—12 by spring clip members 44 and 45. The spring clips are secured to the inside wall faces of the top wall 10 and to the bottom panel and the grill structures are spaced around the margins thereof as shown in Fig. 1 whereby the entire unit may be suspended on hooks 46 (see Fig. 2) which are part of a window adaptor frame (not shown) when the unit is used as a ventilator.

The construction disclosed while being of light weight nevertheless is of sufficient ruggedness to prevent vibrations and harmonic build ups with resulting noise. The particular motor supporting bracket comprising a single beam fixed at its ends to the crowned side walls and a vertical column attached to the ribbed bottom panel, have proved to be non-transmitters of vibrations from the fan.

The unit may be used as an air circulator and carried from room to room or it may be mounted in a window by the use of a suitable adaptor and for either inflow or outflow of air. The capacity of the displacement rela-

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tive to the cubic contents of the average home is such that a ten or twelve minute period of operation serves to replace all of the air. Hence when serving as a ventilator on the upper floor of a dwelling the unit timer may be set for any period of operation desired without additional attention.

We claim:

1. A portable motor and fan housing unit comprising an open housing frame consisting of an outwardly crowned sheet metal member forming the top and side walls of the housing, a drawn sheet metal bottom panel, said crowned member having a continuous marginal flange integrally formed throughout the front and back margins thereof, said flanges being rounded and the bottom panel having end flanges shaped to fit the rounded edges and crown of the housing member and a round semi-venturi member within the housing of a diameter to be substantially tangential to the inner faces of the top, sides and bottom panel of the housing and connected to the top, sides and bottom at the said points of tangency.

2. A portable motor and fan housing unit comprising an open housing frame consisting of a drawn sheet metal member forming the top and side walls of the housing, a drawn sheet metal bottom panel, said member having a continuous marginal flange rounded and integrally formed at the front and back margins thereof and said bottom panel having end flanges shaped to fit the rounded edges of the housing member and a round semi-venturi member having a cylindrical diameter and of a size to be substantially tangential to the inner faces of the top, sides and bottom wall of the housing.

3. A portable motor and fan housing of generally rectangular shape with motor and fan unit suspended therein, the fan housing comprising a single inverted U-shaped member forming the top and side walls of the housing and with the front and back side margins rounded to terminate in vertical planes, a bottom panel member draw shaped to have a continuous marginal flange formed thereabout with the corners of the flange rounded to fit the rounded margins of the U-shaped member, a three-armed bracket structure for supporting the motor fan unit attached to the bottom panel and to the side walls of the housing and a semi-venturi tubular ring structure tangentially attached to the top and bottom panel and to the side walls.

4. A portable motor and fan housing of generally rectangular shape with motor and fan unit suspended therein, the fan housing comprising a crowned single piece inverted U-shaped member forming the top and side walls of the housing with the front and back side margins rounded to terminate in vertical planes, a bottom panel member draw shaped to have a continuous marginal flange formed thereabout with the corners of the flange rounded to fit the rounded margins of the U-shaped member, said bottom panel having a struck up land rib formation, a three-armed bracket structure for supporting the motor fan unit attached to the bottom panel and to the side walls of the housing and a semi-venturi ring structure tangentially attached to the top and bottom panel and to the side walls.

5. A portable motor and fan housing unit comprising an open housing frame consisting of a drawn sheet metal member forming the top and side walls of the housing, a drawn sheet metal bottom panel, said member having a continuous marginal flange integrally formed at the front and back margins thereof, said flanges being rounded and terminating in vertical planes and said bottom panel having a continuous flange shaped to fit the rounded edges of the housing member, front and back grill panels disposed in the front and back openings of the housing structure and spring clips secured to the inner faces of the housing members extending outwardly over said flanges and supporting the grill panels in the vertical planes of the edge terminals of said housing member in spaced relation to marginal edges.

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6. A portable motor and fan housing of generally rectangular shape with motor and fan unit suspended therein, the fan housing comprising a single inverted U-shaped member forming the top and side walls of the housing with the front and back side margins rounded to extend in vertical planes and a bottom panel member draw shaped to have a continuous marginal flange formed thereabout with the end corners of the flange rounded to fit the rounded margins of the U-shaped member.

7. A portable motor and fan housing of generally rectangular shape with motor and fan unit suspended therein, the fan housing comprising a single inverted U-shaped member forming the top and side walls of the housing with the front and back side margins rounded to extend in vertical planes, a bottom panel member draw shaped to have an upwardly extending continuous marginal flange formed thereabout with the corners of the flange rounded to fit the rounded margins of the U-shaped member, a three armed bracket structure for supporting the motor fan unit attached to the bottom panel and to the side walls of the housing and a semi-venturi ring structure tangentially attached to the top and bottom panel and to the side walls.

8. A portable motor and fan housing unit comprising a frame structure open at the back and front and formed by an inverted U-shaped member and a bottom pedestal member connected to the lower ends of the legs of the U-shaped member, a motor and fan mounting comprising a beam member connected at the ends thereof to the legs of the U-shaped member, a vertical column secured to the pedestal member and extending above the beam member, there being openings in the beam member and the column member and a motor casing mounted on the beam and column members by the motor casing bolts extending through said openings.

9. A portable motor and fan housing unit comprising a frame structure open at the back and front and formed by an inverted U-shaped member and a bottom pedestal member connected to the lower ends of the legs of the U-shaped member, a motor and fan mounting comprising a beam member connected at the ends thereof to the legs of the U-shaped member, a vertical column secured to the pedestal member and extending above the beam member, there being openings in the beam member and the column member, a motor having threaded extensions on the casing bolts thereof, insulator means in the openings of the beam and column and said motor casing bolts extending through the insulators and constituting the sole mounting for the motor.

10. A portable motor and fan housing unit of generally rectangular shape with a motor-fan unit suspended therein, the fan housing comprising a crowned top and side walls and an upwardly flanged bottom pedestal panel, the end portions of the bottom panel flange being crown shaped to fit the bottom regions of the crowned side walls and said bottom panel having end pedestal formations extending thereacross connected by an elevated rib formation extending between the pedestal formations.

11. A portable motor, fan and housing unit comprising a generally rectangular frame structure open at the back and front and formed to have top and side walls channel shaped in cross section with the flanges of the channel extending inwardly and a bottom pedestal formation, a motor and fan mounting comprising a beam member connected at the ends thereof to the interior of the side walls, a vertical column secured to the interior of the pedestal formation and extending above the beam member, there being openings in the beam member and the column member, a motor having threaded extensions on the frame bolts thereof, insulator means in the openings of the beam and column and said motor frame bolts extending through the insulators and constituting the sole mounting for the motor.