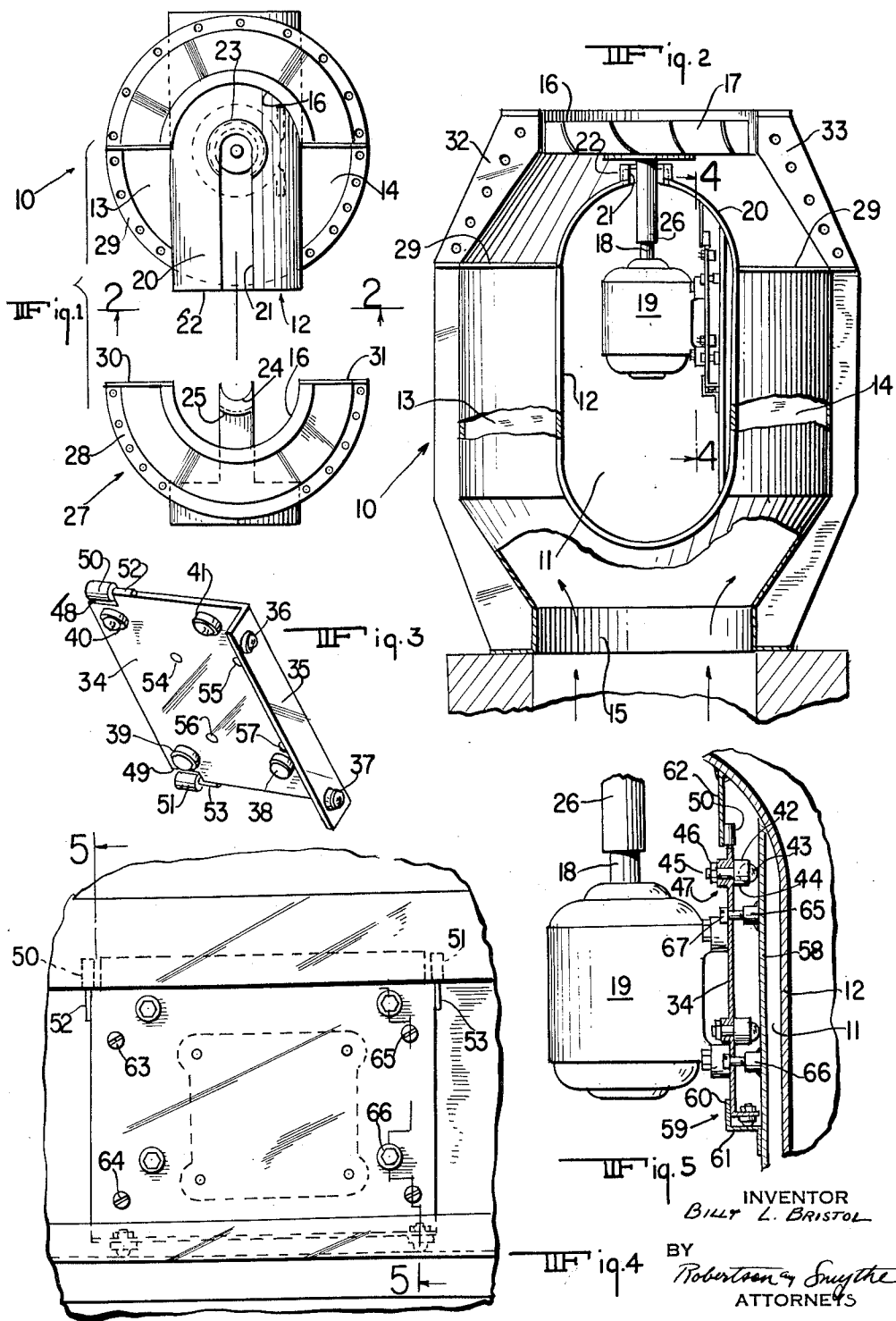


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FANS

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The present invention relates to fans of the bifurcated fan casing type for handling destructive fumes, and particularly to a new and improved mounting for the motor of such fans.

In the handling of destructive fumes, fan casings are often constructed with a walled passage extending transversely through a tubular casing, forming duct means on either side of the walled passage that have a common inlet and outlet. The motor is mounted within the walled passage means and its output shaft passes through one of the walls of the walled passage, extending into the common inlet or outlet and supporting therein a fan blade.

A serious problem arises in removably mounting the motor within the walled passage, particularly in large installations.

The principal object of this invention is to provide a combined bifurcated fan casing and motor mount that will afford easy removal and reassembly of the fan wheel, motor shaft and motor.

Another object of the invention is to provide such a combined bifurcated fan casing and motor mounting in which the motor shaft and fan blade may be slid into and out of proper position within the walled passage within the bifurcated casing.

In one aspect of the invention, a generally tubular-shaped casing may have a walled passage extending transversely through it so as to provide branch conduits on each side of the transverse passage leading from a common inlet to a common outlet. There may be an axial slot or similar aperture in the wall of the walled passage that is parallel to the passage and extends from one end thereof to the center of the tubular casing. There also may be a removable section of the tubular casing including means for effectively closing and hermetically sealing said slot or aperture. The removable casing may have a portion of the walled passage integral therewith.

In another aspect of the invention, a motor, supporting a fan blade, may be mounted on a plate having a right angular ledge portion. The face of the plate opposite that to which the motor is fixed, as well as to the outer face of the ledge, may be provided with anti-friction caster means.

In still another aspect of the invention, a track supporting plate may be fixed to a wall of the walled passage and it may include a track member adapted to receive the castered ledge of the motor mounting plate. The length of the track and its supporting plate may be substantially as long as the walled transverse passage within the casing.

In still another aspect of the invention, another plate parallel to, and spaced from, the track supporting plate may depend from the walled passage and be of a width such as to overlie one longitudinal edge of the motor mounting plate when the ledge of the latter rests within the track on the track supporting plate.

In a still further aspect of the invention, rollers may be mounted on the motor mounting plate, for cooperation with the depending plate to thereby complete a track arrangement along which the motor and its mounting plate may be slid in positioning it centrally of the walled passage.

In still another aspect of the invention, fastening means may be provided between the motor mounting plate and the track supporting plate for removably attaching the

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motor mounting plate in position to locate the fan properly within the inlet or outlet of the bifurcated casing.

The above, other objects and advantages of the invention will become apparent from the following specification and accompanying drawing which is merely exemplary.

In the drawing:

FIG. 1 is an exploded top plan view of a fan casing to which the principles of the invention have been applied;

FIG. 2 is an enlarged view taken substantially along line 2-2 of FIG. 1;

FIG. 3 is a perspective view of the motor mounting plate shown in FIG. 2;

FIG. 4 is a plan view taken substantially along line 4-4 of FIG. 2; and

FIG. 5 is a sectional elevational view taken substantially along line 5-5 of FIG. 4.

Referring to the drawing, the principles of the invention are shown as applied to a fan casing 10 having a passage 11 extending transversely therethrough that is surrounded by a wall 12 which divides the casing 10 into two ducts 13 and 14 on opposite sides of the passage 11 and which ducts lead from a common inlet 15 and to a common outlet 16. In the embodiment disclosed, a fan 17 is shown as located within the outlet 16. It may be attached to the output shaft 18 of an electric motor 19. The upper portion 20 of the wall 12 may be provided with a slot 21 extending from the one end 22 of the passage 11 to the center thereof. It is adapted to receive the shaft 18 of motor 19 as the motor and fan are moved to the center of the passage 11 with the fan 17 outside of the passage 11 and within the outlet 16.

A portion of a collar 23 may be mounted at the inner terminus of the slot 21 which forms, with a portion 24 on a closure 25 for the slot 21, a seal through which the shaft 18 and a sleeve 26 on fan 17 pass and which prevents the fluid being conveyed through the casing 10 from leaking into the passage 11 and affecting the motor 19.

In order to permit assembly and removal of the motor 19 and fan 17, a portion 27 of casing 10 may be removably attached to the casing 10 by removable bolts along flanges 28, 29, 30, 31, 32 and 33.

In relatively large installations, the sizes of motor 19 and fan 17 are relatively large, and the distance to the midpoint of passage 11 is also large. Since the fan 17 and motor 19 are assembled and removed from the casing 10 with ducts leading upwardly from the casing 10, and with only portion 27 removed, it appears quite evident that the mounting of motor 19 in proper position within passage 11 becomes a substantial task.

Referring to FIG. 3, a motor mounting plate 34 may be provided with a flange forming a ledge 35. Ball bearing casters 36 and 37 may be attached to the ledge 35, and similar casters 38, 39, 40 and 41 may be attached to the one face of the plate 34, preferably with the balls thereof extending from the face of plate 34 from which ledge 35 extends. Each of the ball casters may comprise a housing 42 within which a ball 43 is rotatably mounted, with a substantial portion thereof extending outwardly from a collar 44. The housing 42 may have a threaded stud 45 extending from housing 42 oppositely from ball 43, and it may receive a nut 46 that abuts against the top of a frame 47 on plate 34 within which housing 42 is received.

The edges of plate 34, at points opposite the ledge 35, may be notched at 48 and 49 for the reception of rolls 50 and 51. These rolls may be metal sleeves impregnated with lubricant through which may extend headed rivets 52 and 53, the shanks of which may be welded or otherwise fastened to the edges of plate 34. Four holes 54, 55, 56 and 57 may extend through plate 34 through which

bolts may pass for attaching the motor 19 to plate 34 on the face thereof opposite that from which the ball bearing casters extend.

Referring to FIG. 5, within the passage 11 and spaced a small distance from one wall 12, a plate 58 may be rigidly mounted. A member 59 may be fixed to plate 58 and it may extend along a line parallel to a longitudinal axis of passage 11. The member 59 may include a flange 60 forming a trough 61 within which the ledge 35 of plate 34 is adapted to be received. Another short plate 62 may fixedly depend from wall 12 in spaced relation to plate 58 and in alignment with the flange 60 of member 59.

The construction and arrangement of the parts are such that the plate 34 with motor 19 mounted thereon may have its edge containing ledge 35 fed into the trough 61 with the ball bearing casters 36, 37 on the ledge contacting the bottom wall of trough 61. The top edge of plate 34 may be received between plates 62 and 58 with rolls 50 and 51 contacting the one face of plate 62. The ball bearing casters 38, 39, 40 and 41 will then contact plate 58 so that the assembly can, with facility, be slid into the passage 11 to the center thereof with shaft 18, sleeve 26 and fan 17 located along the centerline of outlet 16.

Referring again to FIGS. 4 and 5, threaded bosses 63, 64, 65 and 66 may be rigidly attached to plate 58 in position to correctly locate motor 19 within passage 11. Cap screws 67 may extend through the plate 34 to thereby fix the motor 19 and plate 34 in the proper position within passage 11.

From the foregoing it is evident that removal of portion 27 of casing 10 and the removal of cap screws 67 will permit sliding plate 34, motor 19 and fan 17 outwardly of passage 11 to facilitate maintenance of motor 19 and replacement of the fan 17 if necessary.

Although the various features of the fan and motor mounting have been shown and described in detail to fully disclose one embodiment of the invention, it will be evident that changes may be made in such details and certain features may be used without others without departing from the principles of the invention.

What is claimed is:

1. Apparatus comprising in combination, a hollow tubular casing with a walled passage extending transversely therethrough; a first plate attached to a passage wall in parallel spaced relation thereto; a horizontally disposed member parallel with a through axis of said passage, fixed to said first plate and forming a first trough-like track along said first plate; another plate attached to said passage wall in spaced relation to said first plate and forming an inverted trough-like track aligned with said first trough-like track; a plate having a motor fixedly mounted thereon and arranged so that its longitudinal edges are received within said trough-like tracks; and anti-friction means between said motor mounting plate and said trough-like tracks.

2. Apparatus comprising in combination, a hollow tubular casing with a walled passage extending transversely therethrough; a slot in one end wall of said passage and extending in a direction lengthwise of said passage; a first plate attached to a passage wall in parallel spaced relation thereto; a horizontally disposed member parallel with a through axis of said passage, fixed to said first plate and forming a first trough-like track along said first plate; another plate attached to said passage wall in spaced relation to said first plate and forming an inverted trough-like track aligned with said first trough-like track; a plate having a motor fixedly mounted thereon and arranged so that its longitudinal edges are received within said trough-like tracks and the shaft of said motor registers with said slot; anti-friction means between said motor mounting plate and said trough-like tracks; and a removable portion of said casing adapted to close said slot after said motor is in position within said passage.

3. Apparatus comprising in combination, a hollow tubular casing with a walled passage extending trans-

versely therethrough; a slot in one end wall of said passage and extending in a direction lengthwise of said passage; a first plate attached to a passage wall in parallel spaced relation thereto; a horizontally disposed member parallel with a through axis of said passage, fixed to said first plate and forming a first trough-like track along said first plate; another plate attached to said passage wall in spaced relation to said first plate and forming an inverted trough-like track aligned with said first trough-like track; a plate having a motor fixedly mounted thereon and arranged so that its longitudinal edges are received within said trough-like tracks and the shaft of said motor registers with said slot; anti-friction means between said motor mounting plate and said trough-like tracks; a removable portion of said casing adapted to close said slot after said motor is in position within said passage; and means for removably fixing said motor mounting plate to said first mentioned plate.

4. In a fan unit having a hollow tubular casing with a walled passage extending transversely therethrough, a slot in one end wall of said passage and extending in a direction lengthwise of said passage, a first plate attached to a passage wall in parallel spaced relation thereto; a horizontally disposed member parallel with a through axis of said passage, fixed to said first plate and forming a first trough-like track along said first plate; another plate attached to said passage wall in spaced relation to said first plate and forming an inverted trough-like track aligned with said first trough-like track; a plate having a motor fixedly mounted thereon and arranged so that its longitudinal edges are received within said trough-like tracks, and such that the shaft of said motor registers with said slot; a fan attached to said shaft and located within said casing; anti-friction means between said motor mounting plate and said trough-like tracks; and a removable portion of said casing adapted to close said slot after said motor is in position within said passage and said fan is within said casing.

5. In a fan unit having a hollow tubular casing with a walled passage extending transversely therethrough, a slot in one end wall of said passage and extending in a direction lengthwise of said passage; horizontally disposed track means within said passage including vertically spaced track means; a vertically disposed plate adapted to have mounted on it a motor having a shaft, and having one edge for disposition within one of said track means such that the motor shaft registers with said slot; anti-friction means on at least one of said plate and track means; a fan for connection to said shaft and disposition within said casing; and a removable portion of said casing for closing said slot means when the motor is in position within said passage.

6. In a fan unit having a hollow tubular casing with a walled passage extending transversely therethrough, a slot in one end wall of said passage and extending in a direction lengthwise of said passage; spaced trough-like track means mounted within said passage and extending in a direction lengthwise of said passage; a plate having anti-friction means thereon disposed within said track means; a motor mounted on said plate and having a shaft located in said slot; a fan connected to said shaft and located within said casing; and a removable portion of said casing adapted to close said slot when the motor is in position within said passage.

7. In a fan unit having a hollow tubular casing with a walled passage extending transversely therethrough, a slot in one end wall of said passage and extending in a direction lengthwise of said passage; horizontally disposed track means within said passage including vertically spaced track members; a vertically disposed plate adapted to have mounted on it a motor having a shaft, and having one edge for disposition within one of said track members such that the motor shaft registers with said slot; anti-friction means on at least one of said plate and track means; a fan for connection to said shaft and disposition

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within said casing; a removable portion of said casing for closing said slot means when the motor is in position within said passage; and means for removably fixing said motor mounting plate to said walled passage at a predetermined location along said track means.

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References Cited in the file of this patent

UNITED STATES PATENTS

2,464,473	Wessel	Mar. 15, 1949
2,898,030	Hull	Aug. 4, 1959
2,932,441	Harp	Apr. 12, 1960