

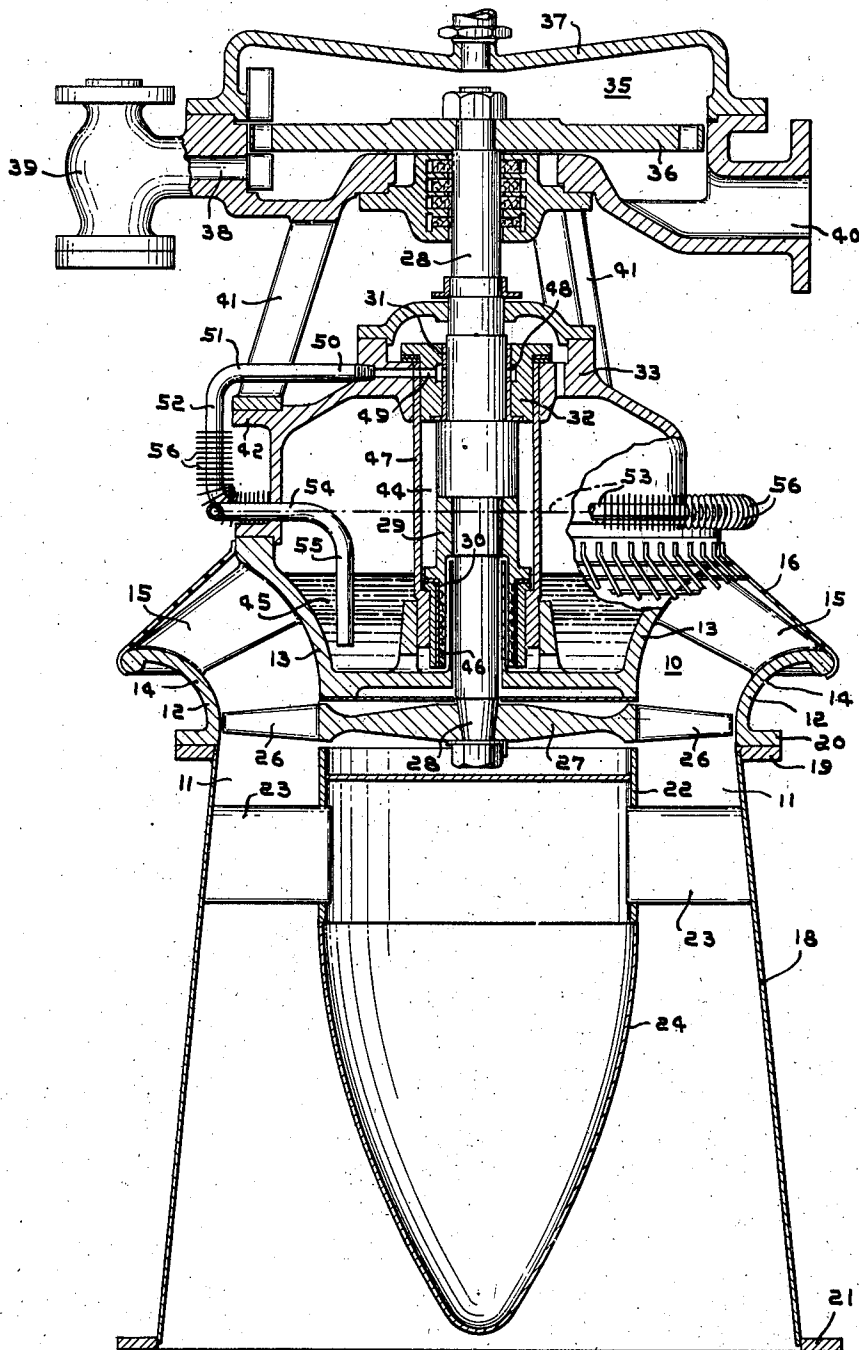
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BLOWER APPARATUS

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BLOWER APPARATUS

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2 Claims. (Cl. 230-120)

This invention relates to blowers of the propeller type, and has for an object the provision of improved lubricant cooling means therefor.

Another object of the invention is to provide, in a propeller-type blower, an arrangement of lubricant cooler whereby the lubricant will be cooled by the air drawn into the blower by the propeller.

These and other objects are effected by the invention as will be apparent from the following description and claims taken in connection with the accompanying drawing, forming a part of this application, in which the single figure is a vertical sectional view through a propeller-type blower embodying the principles of the present invention.

Referring now to the drawing more in detail, the reference 10 indicates, in its entirety, a double-walled casing, providing an annular passage 11 for flow of air through the blower. The double-walled casing includes an upper inlet casting 12, comprising an inner wall 13 and outer wall 14, joined by a plurality of radially-extending supporting vanes 15, the inlet to the passage being closed by a suitable screen 16. The lower or discharge portion of the annular passage 11 is formed by the diverging outer wall 18, having at its upper edge the flange 19, secured by suitable means to a mating flange 20 at the lower edge of the inlet casting 12. The casing 18 is provided at its lower edge with flange 21, by which the entire blower may be secured to suitable supporting structure, for example, the deck of a ship.

The inner wall of the outlet portion of the passage is formed by an annular member 22, secured to the outer wall 18 by a plurality of discharge guide vanes 23, extending radially between the walls 22 and 18. A fairing member 24 is joined at its upper edge to the lower edge of the annular member 22, and provides a streamlined terminus for the exit portion of the air passage.

A plurality of propeller blades 26 are positioned in the throat portion of the passage 11, between the inlet and outlet portions thereof, and are carried by a hub structure 27, secured to the lower terminal portion of the vertical shaft 28.

The shaft 28 has fixedly secured thereto a journal sleeve 29, mounted in a combined radial and thrust bearing 30. An upper radial bearing 30 and is carried by the bearing housing 32, secured in the bearing casing 33. The shaft 28 is driven by suitable motor means, such as the turbine 35, and comprising a rotor 36 disposed

within a stator or casing 37, to which motive fluid may be admitted through the inlet passage 38 controlled by the valve 39, the motive fluid exhausting from the casing 37 through the outlet 40. The casing 37 is supported by a plurality of legs 41, bolted or otherwise suitably secured to a flange 42 on the bearing casing 33.

The inner wall 13 of the inlet casing 12 forms the outer wall of a lubricant reservoir 45, in which a sufficient quantity of lubricant is kept to maintain the lower bearing 30 partially submerged. The journal sleeve 29 is provided on its external surface with a spiral groove forming a viscosity pump 46, which forces lubricant through the bearing 30 under pressure and upwardly therefrom through an annular passage 44, formed between the shaft and the surrounding sleeve 47, to the upper bearing 31, where the lubricant is discharged to the lubricant groove 48, from which it flows through the radial passage 49 to the conduit 50, through which it returns to the reservoir 45.

The conduit 50 comprises a radially-extending section 51 merging into a vertical section 52 which, in turn, merges into an arcuate section 53, extending substantially completely around the lower edge of the bearing casing 33 in close proximity to the inner periphery of the inlet of the annular air passage 11. This arcuate section 53 merges into a radial section 54 terminating in a vertical section 55, disposed within the reservoir 45. The arcuate section 53 of the conduit 50 is preferably provided with a plurality of disc-like fins 56, providing for a high degree of heat exchange between the lubricant passing through the conduit section 53 and the air flowing through, and in contact with, the fins 56 as it enters the annular air passage 11.

It will be obvious that this type of cooling conduit, disposed in the path of the air drawn into the annular passage by the propeller blades 26, provides for maximum cooling effect with the use of minimum length of cooling conduit.

While the invention has been shown in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and it is desired, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What is claimed is:

1. In a vertical propeller-type blower, a double-walled casing providing an annular passage for flow of air; a propeller in the passage and having

a hub; a vertically-disposed shaft carrying the hub and propeller; a pair of vertically-spaced bearings for the shaft, the lower of said bearings being a combined radial and thrust bearing and the upper of said bearings being a radial bearing; a lubricant reservoir; means for supplying lubricant from the reservoir to said bearings; and means for returning lubricant from the bearings to the reservoir, said means comprising a conduit having an intermediate finned portion of arcuate form disposed adjacent a major portion of the inner periphery of the annular air passage inlet and in the path of air entering the latter, whereby lubricant flowing through said conduit from the bearings to the reservoir is cooled by said entering air.

2. In a vertical propeller-type blower, a double-walled casing providing an annular passage for flow of air; a propeller in the passage and having a hub; a vertically-disposed shaft carrying the hub; a pair of vertically-spaced bearings for the

shaft, the lower of said bearings being a combined radial and thrust bearing and the upper of said bearings being a radial bearing, housings for said bearings; a lubricant reservoir surrounding said combined radial and thrust bearing and adapted to maintain said bearing supplied with lubricant; a viscosity pump associated with the lower bearing and adapted to force lubricant therethrough and therepast to the upper bearing; and means for returning lubricant from the upper bearing to the reservoir; said means including the upper bearing housing formed with a lubricant-receiving groove, a conduit connecting said groove with the reservoir, and said conduit having an arcuate intermediate portion disposed in close proximity to the inner periphery of the annular air passage inlet, whereby lubricant flowing through said conduit is cooled by air drawn into the annular passage by the propeller.

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