AXIAL FLOW FANS OR AXIAL FLOW PUMPS

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1 Claim. (Cl. 230—120)

This invention relates to an axial flow fan or an axial flow pump, having a casing which is conically widened behind the impeller and connected to a discharge conduit.

For obtaining access to the impeller in a fan or a pump of this type and for removing the impeller, if necessary, the casing in the region of and behind the impeller is made in two halves. Such a construction, however, requires much labour and is, therefore, rather expensive.

The invention has for its object to make the impeller of an axial flow fan or pump accessible in a simple manner.

According to the invention the widened section of the casing is adapted to be moved through some distance in axial direction into the discharge conduit connected to said section of the casing, said movable section of the casing being provided with a cylindrical outer face at its end facing the discharge conduit. Said cylindrical outer face of the movable section of the casing preferably is sealed with respect to the wall of the adjacent part of the discharge conduit by means of a resilient sealing ring. With said arrangement the widened section of the casing may freely expand in axial direction, so that when pumping hot gases and hot liquids heat stresses of the casing are avoided.

The accompanying drawing shows a sectional elevation of an axial flow fan according to the invention.

The casing has in the region of the impeller 1 a cylindrical section 2 to which the inlet mouth 3 is secured by means of a flanged joint 17. Within the inlet mouth 3 of the casing a stationary, hollow conical body 4, in which a bearing 5 for the shaft 6 of the impeller is mounted.

At the discharge side of the impeller a stationary, hollow conical body 7 is mounted adjacent the hub of the impeller. Secured to the cylindrical section 2 of the casing of the fan is a conically widened diffuser 8, the upper edge of which is reinforced by a ring 9 having a cylindrical outer periphery. The diffuser-shaped section 8 of the fan casing is sealed at the ring 9 by a resilient ring 10 which, by means of a clamp ring 11, is urged against the periphery of ring 9 and the flange 13 of the discharge conduit 12.

The cylindrical section 2 of the casing is provided with two or more lugs 14, to which cables or chains 15 are respectively secured and subsequently passed around pulleys 16, so that after disconnecting the flanged joint 17 between the section 2 and the inlet mouth 3, the sections 2, 8 of the casing may be raised with its upper edge and reinforcing ring 9 sliding into the discharge conduit 12. Upon raising the sections 2, 8 the impeller 1 is completely uncovered and freely accessible.

With the embodiment shown in the drawing the impeller is provided with adjustable blades 18 supported by stems 31 rotatably journaled in the impeller hub. The adjusting means for the blades comprises a cylinder 19, in which a sleeve 20 is rotatably supported by bearings 33 and to said sleeve is secured an adjusting disc 21 which is connected by levers 32 to the stems 31 of the blades 18. The cylinder 19 can be displaced axially by means of an actuating rod 22 having an end projecting outside the movable section 8 of the fan casing and said rod may be rotated by said projecting end. The axially movable cylinder 19 displaces the sleeve 20 and its disc 21. The rod 22 has an arm 26 pivoted to a coupling member 27 the lower part of which comprises a clamping shoe 24 that is cooperative with a shoe 34 carried by a lever 28 pivoted to an arm 30 on a hollow rod 23 surrounding the rod 22 and controlling the coupling constituted by the shoes 24, 34. A projection 29 on the top of the cylinder 19 is releasably clamped by the shoes 24, 34. When said coupling 24 is engaged the impeller blades 18 may be adjusted during operation of the fan.

If for inspecting the impeller 1 the sections 2, 8 of the casing are to be raised, the coupling shoes 24, 34 are first disengaged from the projection 29 by rotating the hollow rod 23, so that the connection between the actuating rod 22 journalled in the casing and the adjusting cylinder 19 supported on the impeller shaft 6 is interrupted.

For inspecting the impeller blades 18 the circumferential wall of the section 2 of the casing is provided with a removable door 25.

What I claim is:

An axial flow machine comprising a casing, an impeller journalled in said casing, said casing including an inlet section in fixed relation to said impeller with a conical exhaust section behind said impeller and widening toward its exhaust end and a discharge section slidably surrounding the exhaust end of said exhaust section, said exhaust section being detachably connected with said inlet section and slidable axially into said discharge section, said impeller having adjustable blades, means for adjusting said blades and including actuating means mounted in said exhaust section, and coupling means releasably connecting said actuating means with said adjusting means and enabling disengagement of said adjusting means to permit axial movement of said exhaust section.

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