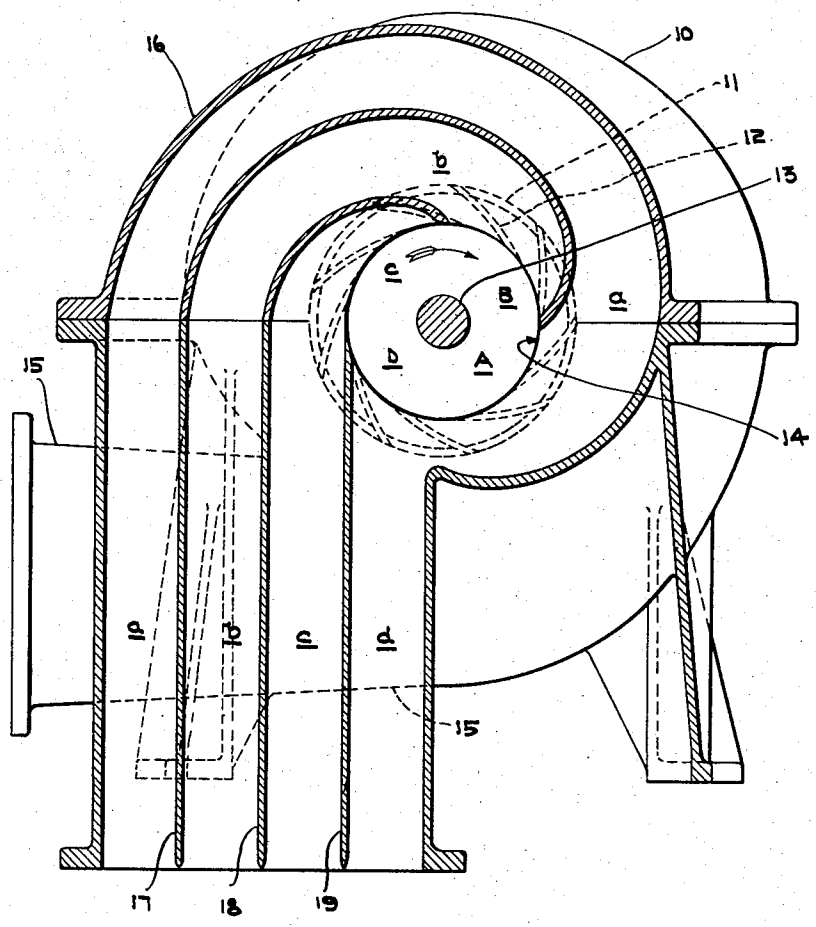
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UNITED STATES PATENT OFFICE

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My invention relates to fluid translating apparatus, and more particularly to centrifugal pumps or blowers, and it has for a broad object to improve the efficiency thereof.

In apparatus of this character heretofore known to me, it has been the practice to provide an inlet opening or eye adjacent the center of the rotor or runner, and to supply fluid to this eye by means of a spiral or volute-shaped inlet connection which extends in a plane substantially parallel to the eye and communicates at its inner end with such eye. The purpose of this arrangement is to produce a rotary effect to the fluid as it nears the eye, which effect is in the general direction of the rotation of the runner so as to minimize the amount of energy absorbed by the runner incident to contact with the fluid. Some difficulty has been experienced in this type of apparatus due to the fact that all portions of the eye are not supplied with equal amounts of fluid. This is caused by the tendency of the fluid to move to the outer side of the volute.

It is, therefore, a more specific object of my invention to provide an improved form of inlet connection for centrifugal pumps or blowers, by reason of which, a rotary motion in the direction of rotation of the runner is given to the fluid as it enters the eye, and in addition, all portions of the eye are supplied with sufficient amounts of fluid.

These and other objects are effected by my 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 transverse sectional view through portions of a centrifugal pump or blower constructed in accordance with the present invention.

According to the present invention, I provide partition means within the volute connection which conform in a general way to the shape of the connection and divide such connection into a plurality of volute-shape passages communicating at their inner end with different portions of the inlet or eye. By reason of this construction, the desired rotary effect is produced adjacent the eye and at the same time fluid is equally distributed to all portions of the eye.

Referring now in detail to the construction illustrated, the reference numeral 10 indicates a pump casing, within which is rotatably mounted a runner 11 having impeller blades 12. The runner is fixed to a rotating shaft 13 which may be operated from any suitable source of power, not shown. The direction of rotation of the runner is indicated by an arrow. The casing 10 is provided with an inlet or eye 14 disposed in a plane normal to the axis of rotation of the runner and adjacent the center of the latter. An outlet 15 serves to convey the fluid away from the casing.

Fluid is supplied to the eye 14 by means of a spiral or volute-shaped inlet connection 16. The connection 16 is disposed in a plane substantially parallel to the plane of the eye 14, and communicates at its inner end with the eye. The connection 16 is so arranged that the fluid adjacent the eye is given a rotary effect in the direction of rotation of the runner 11 so that the losses due to change in direction of flow incident to contact with the impeller blades are minimized. The above construction and operation is well known in the art and further description is therefore deemed unnecessary.

As pointed out above, the entering fluid will tend to travel to the outside of the volute and starve certain portions of the eye. In order to remedy this difficulty, I provide a plurality of partitions 17, 18 and 19 which conform to the general contour of the connection 16, and divide such connection into passages *a*, *b*, *c* and *d*. The inner ends of the partitions 17, 18 and 19, in conjunction with the outer walls of the connection 16, divide the periphery of the eye 14 into equal segments indicated at A, B, C, and D, which communicate, respectively, with the inner ends of the passages *a*, *b*, *c* and *d*.

The passages supply their respective segments of the eye with equal amounts of fluid, and are so formed at their inner ends as to cause the fluid to flow in the general direction of rotation of the runner. Furthermore, the partitions, in dividing the fluid into

separate strata and in guiding the strata to the eye 14, produce a more uniform pressure and velocity condition across the curved portions of the connection 16 and, in addition, eliminate turbulence or eddy currents.

While I have shown my invention 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 I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

What I claim is:

1. In centrifugal pumping or blowing apparatus, the combination of a runner mounted to rotate about a fixed axis, means defining a fluid inlet opening adjacent the center of the runner; a spiral or volute-shaped conduit means extending in a plane substantially parallel to the inlet opening and communicating with such opening at the inner end thereof; the conduit means being so arranged with respect to the eye as to direct the flow of fluid in the general direction of rotation of the runner; and partition means dividing such conduit into a plurality of spiral or volute-shape passages communicating at their inner ends with different portions of the inlet opening.

2. The combination with a centrifugal pump or blower comprising a rotary impeller, an outlet, and an inlet opening or eye disposed in a plane normal to the axis of rotation of the impeller and adjacent the center thereof; of a volute-shape inlet connection disposed in a plane substantially parallel to the plane of the eye and communicating at its inner end with said eye; the said connection being so arranged as to direct the flow of fluid in the general direction of rotation of the impeller; and partitions disposed transversely of the connection to divide such connection into a plurality of separate, longitudinally-extending passages, said partitions being curved to conform in a general way to the contour of the volute, whereby the entering fluid is divided into a plurality of streams which are conducted to different portions of the eye.

3. In centrifugal pumping or blowing apparatus, the combination of a runner mounted to rotate about a fixed axis; means defining an inlet opening or eye adjacent the center thereof; volute-shape conduit means communicating at its inner end with the eye for supplying such eye with fluid, and so arranged with respect to the eye and runner as to cause the fluid adjacent the eye to flow in the general direction of rotation of the runner; and partition means disposed transversely of the conduit means and conforming to the same general contour of the conduit means to divide such conduit means into a plurality of passages communicating at their inner ends with the eye; the inner ends of the partition means being so arranged with respect to the conduit means and the eye as to divide such eye into a plurality of segments.

In testimony whereof, I have hereunto subscribed my name this 27th day of March, 1930.

JOSEPH P. LIDIAK.