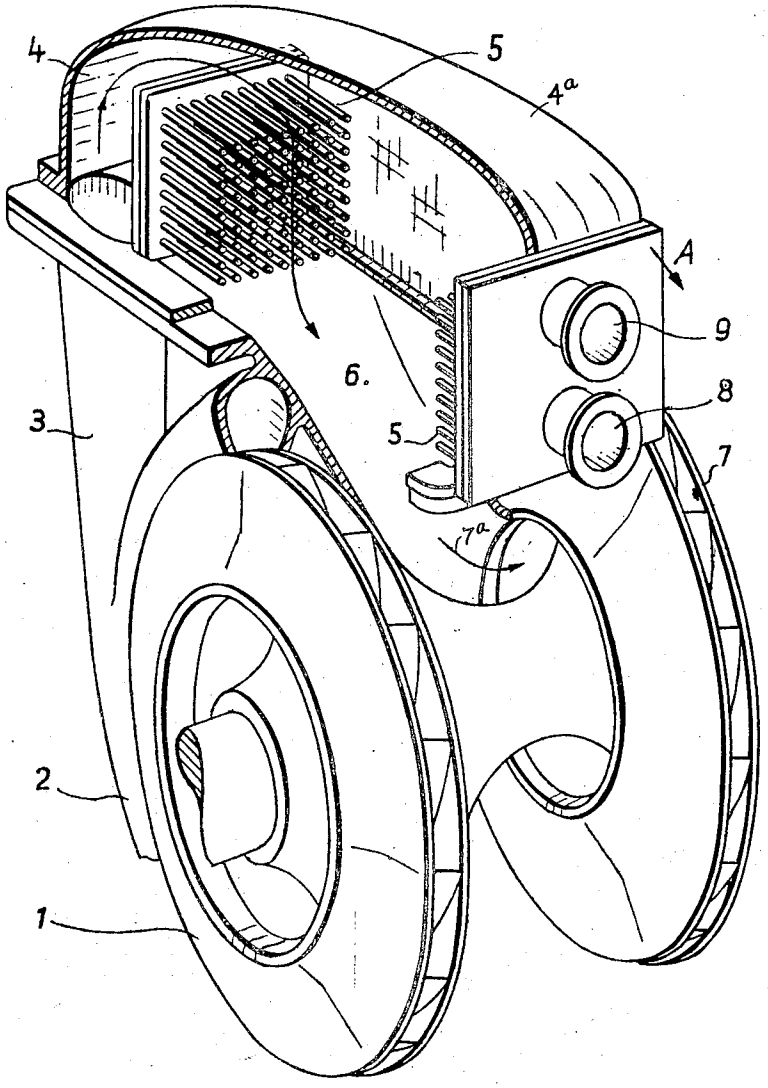
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INTERMEDIATE COOLER FOR MULTISTAGE ROTARY COMPRESSORS

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INTERMEDIATE COOLER FOR MULTISTAGE ROTARY COMPRESSORS

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For improving efficiency and providing for greater output in a multistage rotary compressor a known method exists by which the air temperature is lowered in an intermediate cooler between two stages so as to come as close as is possible to an isothermal condensation. For this purpose the flowing medium is in most cases conducted in one or several parallel streams through one or several coolers. Now if the outlet from one stage is in several spirals it is advisable to arrange a cooler after each spiral section after the conversion of pressure so that the number of coolers is equal to the number of spiral sections is an intermediate stage. However, these known designs exhibit the disadvantage of occupying too much room; the occupied space is moreover badly used.

This drawback may be eliminated by placing the packet of coolers in a specially appropriate position and providing for a suitable guiding of the flowing medium.

According to the present invention the flowing medium is deflected for an angle greater than 90° before entering the cooler elements, and the flow in the cooler elements proceeds toward the center of the compressor.

The attached drawing illustrates in perspective view and partly in section a form of embodiment of the subject matter of the invention.

The flowing medium discharged from the leading impeller wheel 1 reaches the spiral 2 and passes from there into the diffuser 3 connected to the cooler space 4, in the rear end portion of an elongated housing 4a extending tangentially to the circumferential direction of the impeller wheel 1 the conversion of the velocity of the flow medium into pressure taking place in said space 4. The flowing medium is then deflected from said space and passes into the packet of cooler tubes 5 situated tangentially to a circumferential direction of the compressor. Said packet of cooler tubes may be disassembled in the direction A. From the packet of coolers the flowing medium passes into the second stage 7 as shown by arrow 7a through a collecting chamber 6. The cooling water enters the cooler tubes 5 at 8 and is discharged at 9.

As the arrangement shown is repeated for example four times in a four-diffuser blower, nearly the entire surface of the compressor is covered with cooling tubes, which admits of a very low construction in a radial direction. Smooth tubes or riffled tubes may be used or cooling elements of any other form.

Having thus described my invention I claim:

1. A multi-stage centrifugal compressor having the combination of a leading and a succeeding rotatable fluid impeller, the peripheral region of each of said impellers having therein a spiral casing, each of said casings receiving fluid from its impeller for therethrough evolving a high velocity of the fluid, the spiral casing of said leading impeller having a diffusor for converting the velocity of its fluid into pressure, an elongated housing having one end thereof joined to the outlet of said diffuser extending from said diffusor tangentially to the circumferential direction of said leading impeller, said housing having thereunder a collecting chamber joined to the inlet of the suction chamber of said succeeding impeller for conveying the fluid from said diffusor through said housing and chamber and to said succeeding impeller, and said housing having therein a cooling device for the fluid passing therethrough.

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2. A multi-stage centrifugal compressor having the combination of a leading and a succeeding rotatable fluid impeller, the peripheral region of each of said impellers having therein a spiral casing, each of said casings receiving fluid from its impeller for therethrough evolving a high velocity of the fluid, the spiral casing of said leading impeller having a diffusor for converting the velocity of its fluid into pressure, an elongated housing having one end thereof joined to the outlet of said diffusor extending from said diffusor tangentially to the circumferential direction of said leading impeller, said housing having thereunder a collecting chamber joined to the inlet of the suction chamber of said succeeding impeller for conveying the fluid from said diffusor through said housing and chamber and to said succeeding impeller, said housing having therein cooler tubes extending tangentially to the circumferential direction of said leading impeller for cooling the fluid passing through said housing, and said cooler tubes having an inlet and outlet projecting exteriorly of said housing for feeding cooling medium to said tubes.

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