Fig. 1

Fig. 2
1. VALVE-LIFTING MECHANISMS FOR COMPRESSORS

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Filed Mar. 4, 1957, Ser. No. 645,602

Claims priority, application Denmark Mar. 6, 1956

1. Claim. (Cl. 74—110)

In many cases it is desirable to be able to regulate the performance of a compressor. Thus, in a cooling plant the production of cold must preferably keep up with consumption, and if the latter is greatly varying, e.g. when milk is cooled in a dairy, measures are often taken to regulate the performance of the compressor. This is particularly so in the case of direct evaporisation plants, and especially in the case of fully automatic plants, which are not constantly supervised.

Among measures directed to vary the performance of the compressor may be mentioned changing the rotative speed of the compressor, altering the noxious space of the cylinders or disengaging one or several inlet valves. The present invention is based on the last-mentioned measure and relates to a valve-lifting mechanism for compressors, the inlet valves of which are maintained in abutment against their seating by means of springs or in any other manner, and which said mechanism can be operated from a servomotor, and according to the invention the valve-lifting mechanism is characteristic in that the servomotor is mechanically connected with rocker arms through a frame system, which is displaceable substantially at right angles to the plane of the cylinder axis, one end of each said rocker arm being rotatable about a fulcrum, which is fixed in relation to the cylinder concerned, whereas the other end is designed to actuate the inlet valve so as to lift it from its seating, when the arm is rotated into a position, wherein it is completely or approximately perpendicular to the displaceable frame system.

The invention will be particularly explained hereinafter, reference being had to the drawing, wherein:

Fig. 1 shows two cylinders of a compressor, as seen from the side, and provided with a valve-lifting mechanism according to the invention, and

Fig. 2 is a section taken on the line II—II in Fig. 1.

In the drawing each compressor cylinder 10 is provided with an inlet duct 12 and an outlet duct 14, the former of which can be barred from the interior of the cylinder above the piston, not shown, by means of an inlet valve 16, which in the shown embodiment is an annular plate valve, which is maintained in abutment against its seating by means of compression springs, not shown, disposed in spring housings 18. The outlet duct 14 can be closed by means of a discharge valve 20, which is kept closed by springs 22.

In a part 24 in fixed connection with the cylinder there are provided ball sockets 26 to receive a ball on the ends of rocker arms 28, two of which are provided for each cylinder in the shown embodiment. The uppermost free ends of the rocker arms 28 are in contact with a ring 30, which supports rods or pins 32, which in the shown uppermost position bear against the suction valve 16 and keep it away from its seating. When the rocker arms are swung away from the upright position, the ring 30 can be displaced axially downwardly by springs 34, the other end of which abuts against a fixed part of the cylinder, so that the pins 32 permit the inlet valve to occupy its seating.

By means of stops 36, see Fig. 1, the rocker arms 28 can be swung away from the upright position, the stops being fixed on a curved frame 38, which is displaceably mounted by means of pins 40 in bearings 42. The displacement towards the left side is produced by a servomotor 44, when e.g. oil pressure is applied to one side of a piston in the servomotor, whereas the movement towards the right side can be effected by a spring incorporated in the servomotor. The oil pressure can be supplied from the forced lubrication system of the compressor. When the compressor is at a standstill, there will be no oil pressure, and the frame 38 will then be in the position shown in Fig. 1, wherein the rocker arms 28 keep the inlet valve 16 open, so that the compressor can start without load. Not until the oil pressure has risen sufficiently to overcome the spring power of the servomotor will the frame with the stops 36 be displaced to the left, and gradually lowers the rocker arms, so that the inlet valve can be closed and the compressor start pumping.

During the operation of the compressor there will always be a cylinder, wherein the vapor is so heavily compressed that the inlet valve of the cylinder is kept firmly closed. The result of this is that the rocker arms of such a cylinder cannot force the ring 30 with the pins 32 upwardly, and therefore the said rocker arms could not be raised, i.e. they would prevent the displacement of the frame to the right, if certain measures were not adopted.

In the shown embodiment these measures comprise connecting each rocker arm 28 through a tension spring 46 with the frame 38. When the servomotor 44 starts operating so as to relieve the compressor and draws the frame 38 to the right, at any rate one cylinder will instantly be relieved by the rocker arm being raised and opening the inlet valve, and the spring 46 of the other rocker arm will be stretched, and immediately after the compression stroke of the cylinder concerned it will again contract and raise the inlet valve. The relieving of a number of cylinders thus proceeds within a very short time.

If a frame 38 with associated servomotor is provided for each cylinder, the springs 46 or equivalent measures are not required, and the relieving can in such case be produced merely by stops 48 on the frame coming into contact with and raising the rocker arms 28.

In the claims:

A device for transferring a substantially rectilinear movement of a reciprocating actuating member to a plurality of elements each being movable along a path substantially normal to the path of movement of said actuating member, said device comprising a mechanical linkage including a stationary support means, rocker arms associated with said movable elements, said arms having one end thereof pivotally supported in said support means and the other end of each said arm engaging the associated element, said rocker arms being pivotable between a position in which the longitudinal axis of said arms is substantially parallel to the path of movement of said elements, and another position in which said arms are tilted in relation to said path of movement, resilient means connecting each of said arms adjacent the element-engaging ends thereof with said actuating member for urging said arms to the substantially parallel position thereof upon movement of said actuating member in one direction, and abutment means operatively associated with said reciprocating actuating member for engaging each of said arms intermediate the ends of the arms to move the latter into the
tilted positions thereof in response to movement of said actuating member in the opposite direction.

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