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(54) **COMPRESSOR**

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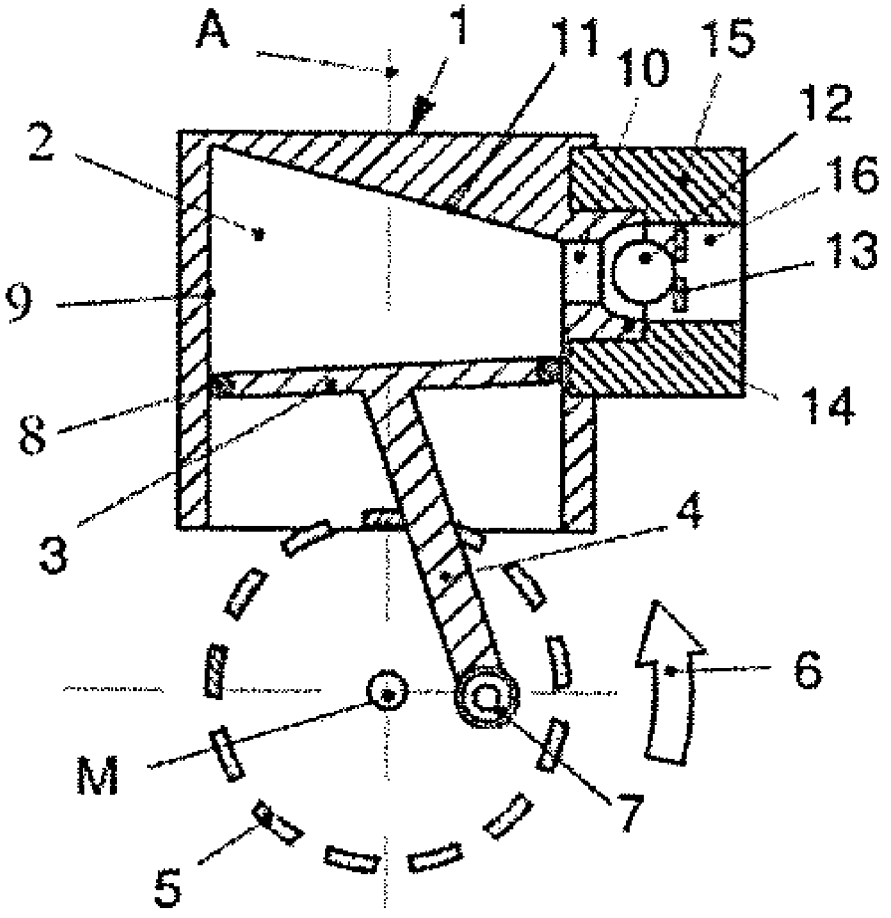
(57) **ABSTRACT**

In the case of a compressor for delivering a medium from a pressure chamber (**2**) in a head (**1**) through an outlet (**10**) into a line (**16**), wherein a piston (**3**) is arranged in the pressure chamber (**2**) and the pressure chamber (**2**) has a longitudinal axis (A) along which the piston (**3**) moves, it is the intention for the piston (**3**) to perform a wobbling movement relative to the longitudinal axis (A).



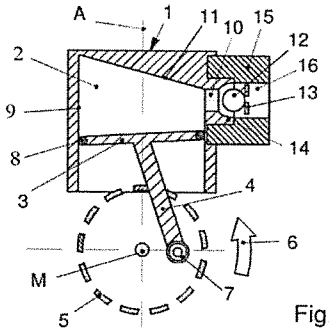


Fig. 1

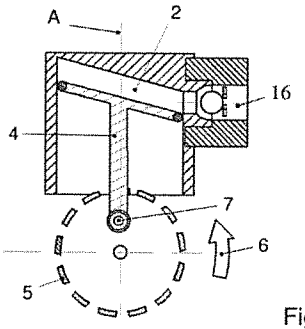


Fig. 2

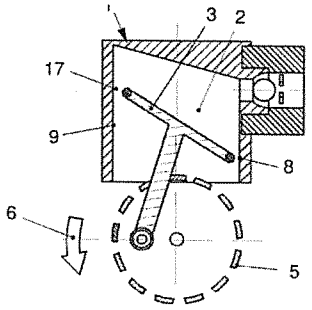


Fig. 3

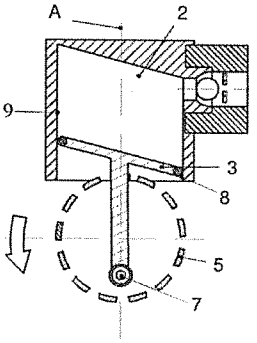


Fig. 4

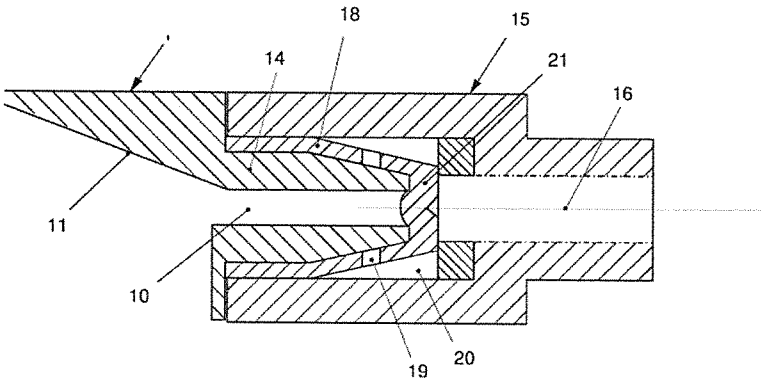


Fig. 5

COMPRESSOR

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The invention relates to a compressor for delivering a medium from a pressure chamber in a head through an outlet into a line, wherein a piston is arranged in the pressure chamber and the pressure chamber has a longitudinal axis along which the piston moves.

[0003] 2. Discussion of Related Art

[0004] Compressors are known, and available on the market, in a wide variety of forms and embodiments. They generally serve to draw in a medium and convey said medium onward. In the present case, reference is made in particular to compressors used in conjunction with tire sealing agent which is introduced into a tire, wherein said compressors then generally also serve for inflating the tire. A compressor of said type is required for example in DE 101 06 468.

[0005] DE 20 2006 008 219 U1 has described a compressor for generating compressed air, having a housing and having a drive which, via an eccentric shaft, moves a pressure piston that is guided in spring-loaded fashion in a cylinder.

[0006] DE 10 2008 061 311 has disclosed a compressor for delivering a gas out of a pressure chamber for the purposes of inflating a tire, wherein a piston is arranged in the pressure chamber so as to be capable of performing an oscillating movement. The piston is assigned a transmission element which converts a rotational movement of a drive shaft into an oscillating movement. Furthermore, the piston is assigned a seal which changes its spacing to a pressure chamber wall upon a change in the direction of movement of the piston. In this way, a gap is formed for drawing in the compressed air. Said device is composed of a multiplicity of individual parts that must be assembled.

SUMMARY OF THE INVENTION

[0007] The problem addressed by the present invention is that of reducing the number of individual components and reducing the structural space. The intention of this is to make the compressor more lightweight and to make the assembly process much cheaper and less susceptible to errors.

[0008] The problem is solved in that the piston performs a wobbling movement relative to the longitudinal axis.

[0009] This refinement makes it possible for the piston to assume a predetermined spacing to the pressure chamber internal wall for the purposes of drawing in the medium, but to then close said spacing for the purposes of discharging the medium. In this way, a seal is simplified and is subject to the least possible loading.

[0010] In a preferred exemplary embodiment, the corresponding wobbling movement of the piston is effected by means of an eccentric. The piston is connected to the eccentric by way of a piston rod, wherein said piston is preferably mounted obliquely on the piston rod. When said piston is then caused to perform a wobbling movement by means of the eccentric, the above-described spacing of the piston to the pressure chamber internal wall is produced and is closed again. This may be realized with or without the seal, wherein, in a preferred exemplary embodiment, at least one annular seal is arranged on the circumference of the piston. It may however also prove to be expedient for an internal wall of the pressure chamber to be designed to be flexible, such that it can yield to a wobbling movement of the piston.

[0011] In a simple exemplary embodiment, the eccentric is simply of disk-shaped form, with the piston rod being connected eccentrically to said eccentric.

[0012] It is also preferable for the pressure chamber to be provided, in the interior, with a sloping roof, wherein the slope is approximately matched to the slope of the piston. Said sloping roof then runs toward the outlet and conducts the medium in that direction.

[0013] A further part of the invention, which is however preferably realized together with the first part, relates to the outlet itself. Said outlet is no longer arranged at the tip of the pressure chamber but is instead situated radially to the side with respect to the longitudinal axis of the pressure chamber. In said outlet there is situated a valve which prevents a backflow of the medium. For this reason, the valve is in the form of a ball-type check valve. Also conceivable, however, is an embodiment as a bicycle valve, with a corresponding connection nipple being equipped with a sheath which deflects under a pressure from the interior of the pressure chamber, such that the medium can penetrate between the nipple and sheath to corresponding openings which then issue into the line for the pressure medium.

[0014] As has already been mentioned in the prior art, it is the intention for the compressor to be used in particular for dispensing a tire sealing agent into a defective tire. For this purpose, the line is then connected to a corresponding container for said sealing agent, such that, by the build-up of a pressure medium, said sealing agent is forced out of the container into the tire. Subsequently, the line may then be connected to a valve of the tire, and the tire inflated. This is one exemplary embodiment of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Further advantages, features and details of the invention will emerge from the following description of preferred exemplary embodiments and on the basis of the drawing, in which:

[0016] FIG. **1** shows a longitudinal section through a head of a compressor according to the invention for delivering a medium, at a compression stage;

[0017] FIG. **2** shows the longitudinal section through the head as per FIG. **1** at the top dead center of a piston;

[0018] FIG. **3** shows the longitudinal section as per FIG. **1**, at an intake stage;

[0019] FIG. **4** shows the longitudinal section as per FIG. **1** at the bottom dead center of a piston;

[0020] FIG. **5** shows a partial section through a head according to the invention of a compressor for delivering a medium, in the region of a valve.

DETAILED DESCRIPTION OF THE INVENTION

[0021] FIGS. **1** to **4** show a head **1** of a compressor according to the invention, in which head a pressure chamber **2** is formed. A piston **3** moves in said pressure chamber **2** along a longitudinal axis A. Here, the piston **3** is connected to a piston rod **4** which is articulatedly connected to an eccentric **5**. In the exemplary embodiment shown here, the eccentric **5** is in the form of a disk that has a central point M. The eccentric **5** rotates about said central point M, as indicated by the arrow **6**. Here, the eccentric **5** drives the piston rod **4** along, said piston rod having an articulated connection **7** to the eccentric **5**. Said articulated connection **7** is arranged with a spacing to the central point M.

[0022] In the exemplary embodiment shown, the piston **3** is arranged obliquely with respect to the piston rod **4**, that is to say said piston, at one side, is at an angle of less than 90° with respect to the piston rod **4** and, at the other side, is at an angle of greater than 90° with respect to the piston rod **4**. This has the effect that the piston **4**, driven by the eccentric **5**, performs a wobbling movement relative to the longitudinal axis A.

[0023] On its circumference, the piston **3** is provided with an annular seal **8** which serves for sealing off the pressure chamber **2** by virtue of the fact that, at certain stages of the movement of the piston **3**, said annular seal bears against an internal wall **9** of the pressure chamber **2**.

[0024] An outlet **10** for the medium to be delivered is provided laterally, that is to say radially, with respect to the longitudinal axis A. The pressure chamber **2** forms a roof **11** that slopes obliquely toward said outlet **10**.

[0025] In the exemplary embodiment shown, the outlet **10** is assigned a ball **12** of a ball valve, which ball can be acted on by a corresponding pressure medium **13**.

[0026] For the outlet **10**, a nipple **14** is formed on the head **1**, onto which nipple there is pushed a hose **15** that forms a line **16** to a container for a tire sealing agent. Said hose **15** may alternatively also be connectable to a valve of a tire.

[0027] As per FIG. **1**, the upward movement of the piston **3** causes a medium to be compressed in the pressure chamber **2** and forced through the outlet **10**, and through the ball valve formed by the ball **12**, into the line **16**. In the process, the medium is conducted to the outlet **10** by means of the sloping roof **11**. At this stage, the annular seal **8** bears firmly against the inner wall **9** of the pressure chamber **2**.

[0028] FIG. **2** shows the top dead center position, in which the articulated connection **7** of the piston rod **4** lies on the longitudinal axis A. Here, the pressure chamber **2** has been reduced in size to the maximum extent possible, such that the greatest possible amount of medium has passed from the pressure chamber **2** through the ball valve into the line **16**.

[0029] During the further movement of the eccentric **5** in the direction of the arrow **6** as per FIG. **3**, the piston **3** is adjusted into an oblique position such that the annular seal **8** is lifted from the internal wall **9** of the pressure chamber **2**, such that an annular passage **17** is formed. The medium to be delivered can be drawn through said annular passage **17** into the pressure chamber **2** as a result of the increase in size of the latter.

[0030] When the piston **3** is at bottom dead center, as per FIG. **4**, the articulated connection **7** lies on the longitudinal axis A again, as a result of which the piston **3** has been tilted such that its annular seal **8** bears against the internal wall **9** of the pressure chamber **2**. Then, during a further movement of the eccentric **5**, the compression stage for the medium to be delivered begins.

[0031] Instead of the ball valve shown in FIGS. **1** to **4**, the head **1** may also be assigned a bicycle valve. In this case, there is mounted onto the nipple **14** a flexible sheath **18**, which may for example be composed of silicone. Said sheath **18** is held by the hose **15** that is pushed on. A connection between the outlet **10** and the line **16** in the hose **15** is realized via openings **19** in the sheath **18**, which openings issue into a space **20** positioned upstream of the line **16**. When medium is forced by the piston **3** into the outlet **10**, a front region **21** of the sheath **18** is lifted from the nipple **14** and opens up a path for the medium to the openings **19**, such that the medium can pass through the openings **19** into the space **20** and from there into the line **16**.

1. A compressor for delivering a medium from a pressure chamber (**2**) in a head (**1**) through an outlet (**10**) into a line (**16**), the compressor comprising:

a piston (**3**) arranged in the pressure chamber (**2**) and the pressure chamber (**2**) includes a longitudinal axis (A) along which the piston (**3**) moves, wherein the piston (**3**) performs a wobbling movement relative to the longitudinal axis (A).

2. A compressor for delivering a medium from a pressure chamber (**2**) in a head (**1**) through an outlet (**10**) into a line (**16**), the compressor comprising:

a piston (**3**) arranged in the pressure chamber (**2**) and the pressure chamber (**2**) includes a longitudinal axis (A) along which the piston (**3**) moves, wherein the outlet (**10**) on the head (**1**) is arranged radially with respect to the longitudinal axis (A).

3. The compressor as claimed in claim **2**, wherein a valve is connected downstream of the outlet (**10**).

4. The compressor as claimed in claim **3**, the valve is in the form of a check valve.

5. The compressor as claimed in claim **3**, wherein the valve is in the form of a bicycle valve.

6. The compressor as claimed in claim **2**, wherein the line (**16**) can be connected to a container for sealing agent and/or to a tire valve.

7. The compressor as claimed in claim **2**, wherein the piston (**3**) is connected to an eccentric (**5**).

8. The compressor as claimed in claim **7**, wherein the connection between piston (**3**) and eccentric (**5**) is realized by way of a piston rod (**4**).

9. The compressor as claimed in claim **7** wherein a central point (M) of the eccentric (**5**) lies on the longitudinal axis (A) of the pressure chamber (**2**).

10. The compressor as claimed in claim **7**, wherein the eccentric (**5**) is of disk-shaped form.

11. The compressor as claimed in claim **8**, wherein the piston (**3**) is arranged obliquely on the piston rod (**4**).

12. The compressor as claimed in claim **2**, wherein, in the pressure chamber (**2**), a sloping roof (**11**) extends toward the outlet (**10**).

13. The compressor as claimed in claim **2**, wherein a flexible annular seal (**8**) is provided on the circumference of the piston (**3**).

14. The compressor as claimed in claim **2**, wherein an internal wall (**9**) of the pressure chamber (**2**) is of flexible form.

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