US 20210363982A1

(19) United States
(12) Patent Application Publication
SCHÖGLER et al.
(10) Pub. No.: US 2021/0363982 A1
(43) Pub. Date: Nov. 25, 2021

(54) **COMPRESSOR**

(71) Applicant: **Secop GmbH**, Flensburg (DE)

(72) Inventors: **Hans Peter SCHÖGLER**, Fehring (AT); **Reinhard RESCH**, Feldbach (AT)

(73) Assignee: **Secop GmbH**, Flensburg (DE)

(21) Appl. No.: **16/956,095**

(22) PCT Filed: **Dec. 19, 2018**

(86) PCT No.: **PCT/EP2018/085960**

§ 371 (c)(1),
(2) Date: **Jun. 19, 2020**

(30) **Foreign Application Priority Data**

Dec. 22, 2017 (EP) 17210207.1

Publication Classification

(51) **Int. Cl.**

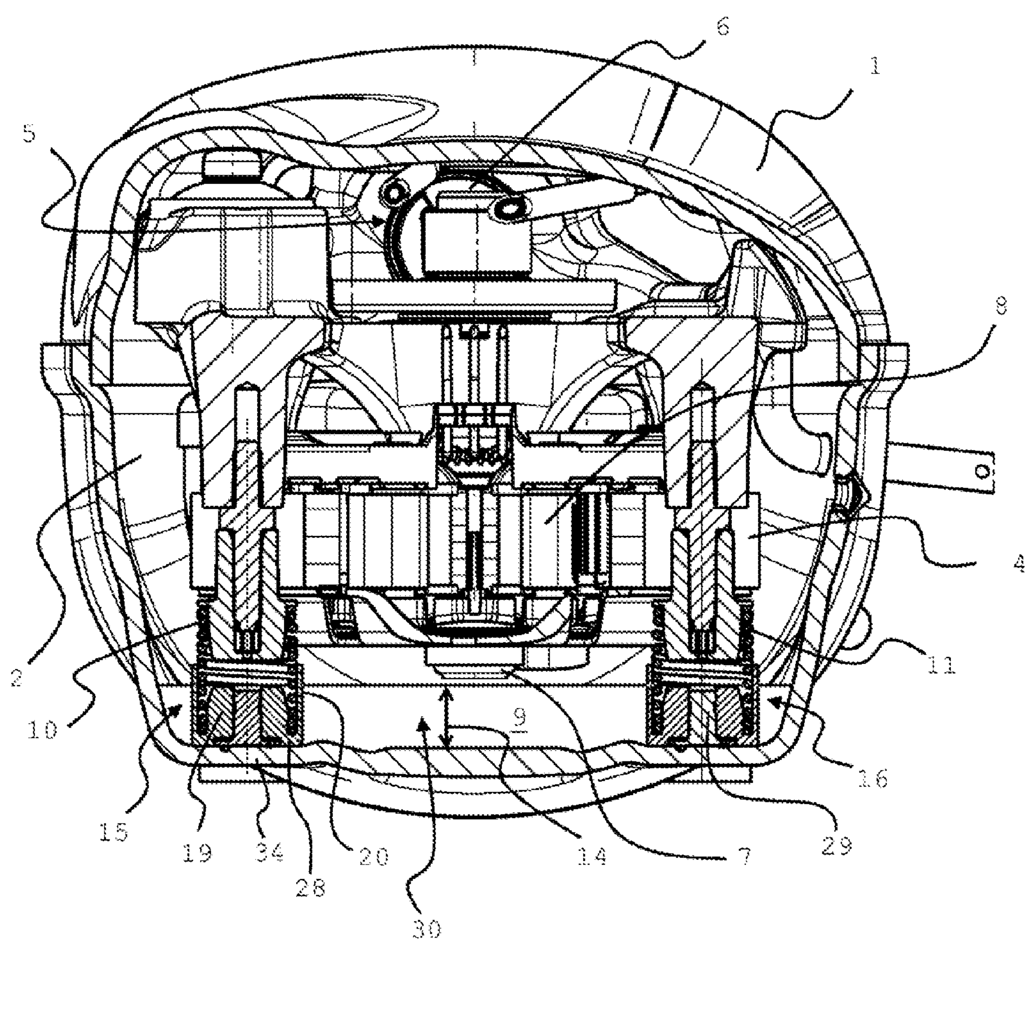
F04B 39/12	(2006.01)
F04B 39/02	(2006.01)
F04B 39/00	(2006.01)

(52) **U.S. Cl.**

CPC ***F04B 39/127*** (2013.01); ***F04B 39/0044*** (2013.01); ***F04B 39/0284*** (2013.01)

(57) **ABSTRACT**

A compressor for compressing coolant circulating in a cooling circuit, wherein the compressor includes at least one receiving element for spring elements carrying a compressor/motor unit. With its casing element, this receiving element protrudes past a sump height of a lubricant sump in a vertical direction, which lubricant sump forms in the housing interior in an operating state of the compressor. Because lubricant is constantly distributed throughout the entire housing interior in the operating state—caused by the motion of the movable parts of the compressor—lubricant also collects within a receiving volume of the receiving element, where it forms a level that is clearly above the sump height of the lubricant sump as viewed in a vertical direction. As a result, a damping of the spring elements is achieved by the lubricant, and therefore without the inclusion of additional means elements.



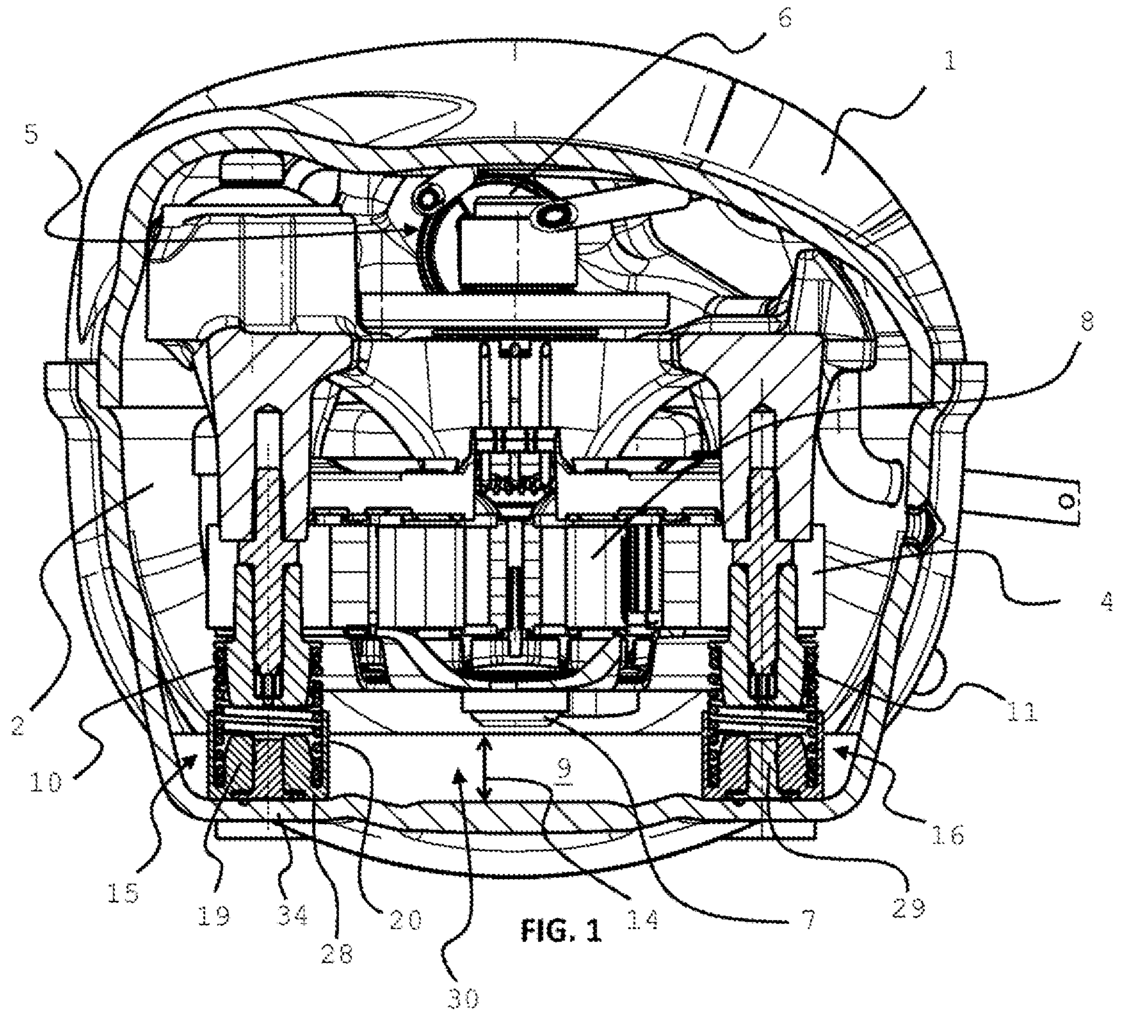

6
1
5
8
2
4
11
10
9
16
15
19
34
28
20
14
7
29
30

FIG. 1

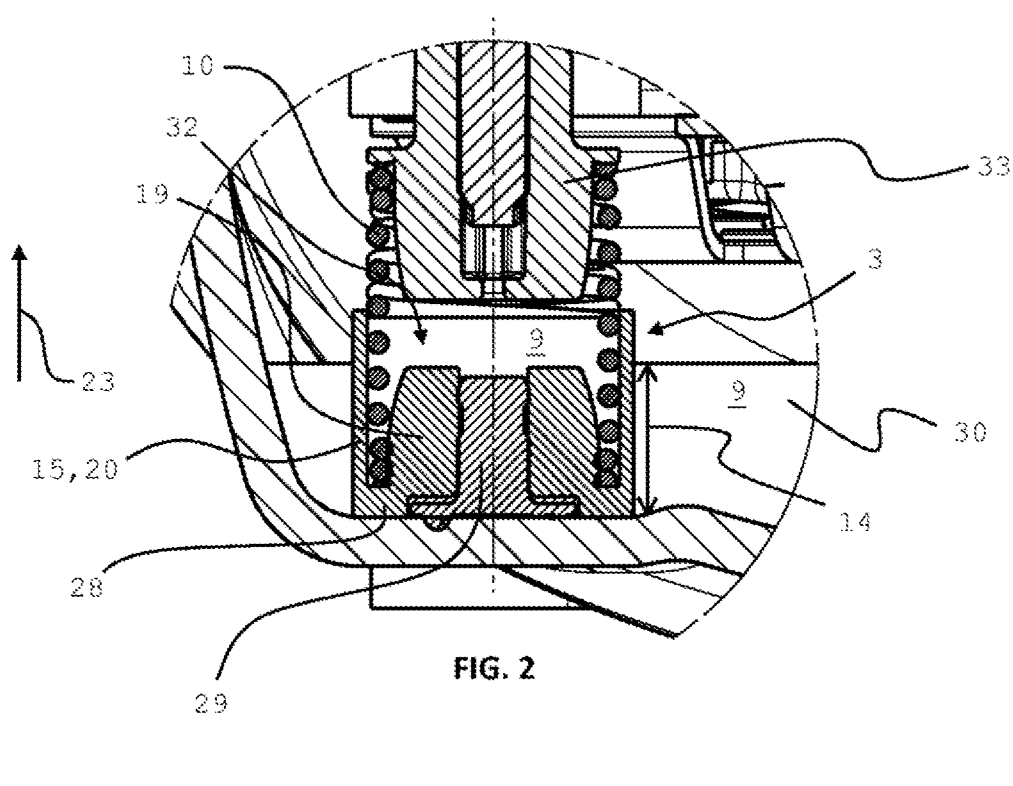

10
32
33
19
3
9
9
23
30
15,20
14
28
29

FIG. 2

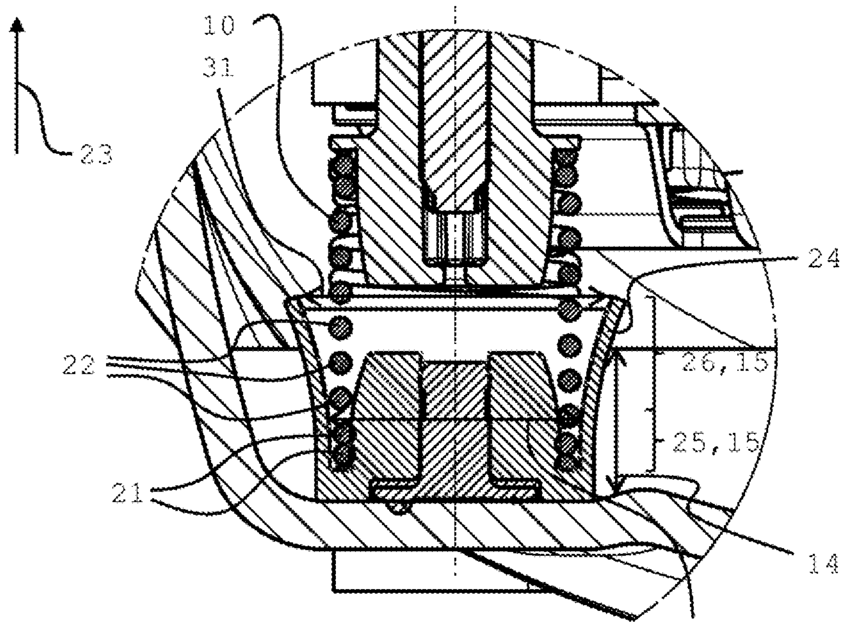

10
31
23
24
22
26,15
25,15
21
14
27

FIG. 3

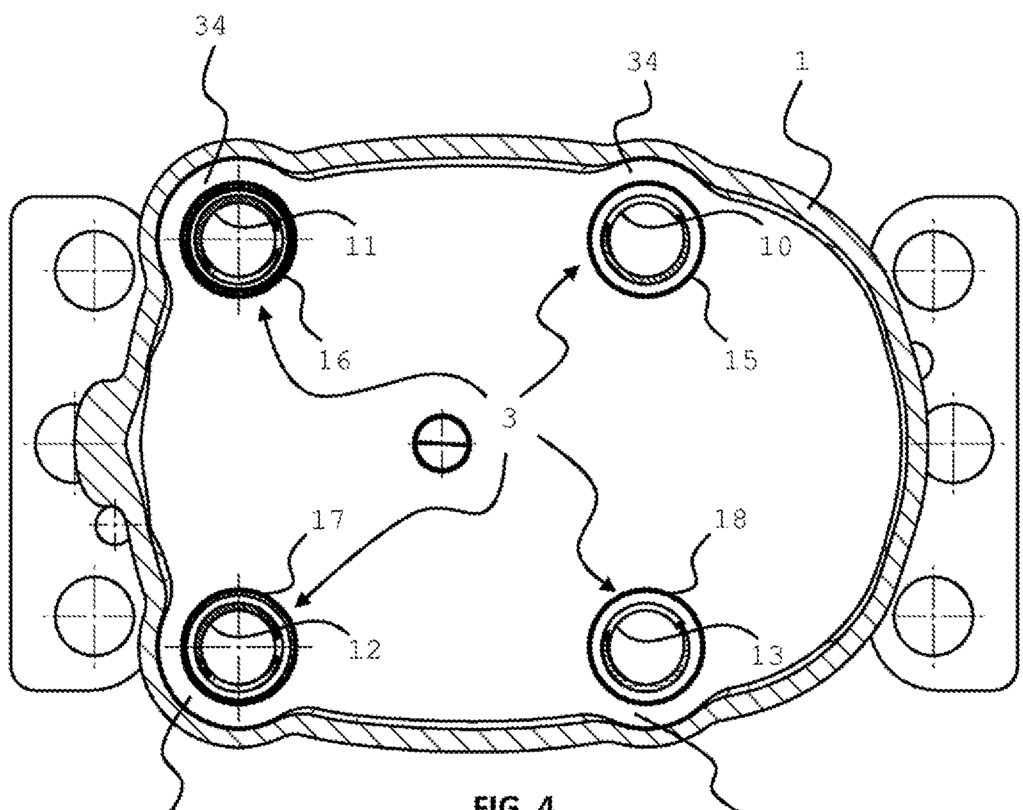

34
34
1
11
10
16
15
3
17
18
12
13
34
34

FIG. 4

COMPRESSOR

FIELD OF THE INVENTION

[0001] The present invention relates to a compressor for compressing coolant circulating in a cooling circuit, comprising a compressor housing enclosing a housing interior of the compressor,

[0002] a compressor/motor unit which comprises at least one piston, which moves in a cylinder, and a motor,

[0003] at least one spring element, preferably multiple spring elements, via which spring element the compressor/motor unit is attached in an elastically mounted manner to a mounting region of the compressor housing, preferably to a base region of the compressor housing,

[0004] at least one receiving element arranged on the mounting region for the at least one spring element, preferably one receiving element for one spring element each, wherein the respective spring element is accommodated in the receiving element, wherein

[0005] the receiving element comprises a base element, which is connected to the mounting region and from which the spring element protrudes in a vertical direction, a casing element, which casing element surrounds the spring element in a sleeve-like manner, and a receiving volume bounded by the base element and the casing element, in order to enable a collection of lubricant in the receiving volume, so that a section of the spring element that is arranged in the receiving volume is enveloped by lubricant in the operating state of the compressor.

PRIOR ART

[0006] In generic compressors according to the prior art, it is a well-known problem that the vibrations caused by the compressor/motor unit are mainly transmitted to the compressor housing of the compressor via spring elements, by means of which the compressor/motor unit is mounted on the housing interior of the compressor. The greater the portion of vibrations transmitted undamped to the compressor housing, the higher the overall noise emission of the compressor.

[0007] Enhancements to known compressors with regard to a reduced noise emission are aimed, for example, at a damping of said vibration transmission in the region of the spring elements. However, it is thereby disadvantageous that special damping elements are often necessary in this case, which by their very nature are exposed to high loads and thus wear out over the long term.

[0008] In this context, it was observed that means which are already present in the housing interior of the compressor in the operating state of the compressor can also be used to damp the vibration transmission. In particular, it was determined that spring elements that are covered to the greatest possible extent by a lubricant sump present in the base region of the compressor housing during the operating state of the compressor only transfer to the compressor housing a very small portion of the oscillations caused by the compressor/motor unit. The viscosity of the lubricant sump, which is formed mainly from oil and coolant, results in a damping of the spring elements surrounded by lubricant.

[0009] However, particularly the arrangement and position of the motor of the compressor/motor unit inside of the housing interior constitute factors that have a limiting effect on the height of the lubricant sump level. The endeavor to reduce the noise emission of the compressor using a higher lubricant sump level is thus opposed by the requirement of not immersing the rotor of the compressor/motor unit in particular in the lubricant sump.

OBJECT OF THE INVENTION

[0010] It is therefore an object of the present invention to provide a compressor that enables an improved damping of the spring elements and the accompanying vibration transmission to the compressor housing.

DESCRIPTION OF THE INVENTION

[0011] The object is attained with a compressor according to the invention for compressing coolant circulating in a cooling circuit, comprising

[0012] a compressor housing enclosing a housing interior of the compressor, a compressor/motor unit which comprises at least one piston, which moves in a cylinder, and a motor,

[0013] at least one spring element, preferably multiple spring elements, via which spring element the compressor/motor unit is attached in an elastically mounted manner to a mounting region of the compressor housing, preferably to a base region of the compressor housing, and

[0014] at least one receiving element arranged on the mounting region for the at least one spring element, preferably one receiving element for one spring element each, wherein the respective spring element is accommodated in the receiving element, wherein the receiving element comprises a base element, which is connected to the mounting region and from which the spring element protrudes in a vertical direction, a casing element, which casing element surrounds the spring element in a sleeve-like manner, and a receiving volume bounded by the base element and the casing element, in order to enable a collection of lubricant in the receiving volume during operation of the compressor, so that a section of the spring element that is arranged in the receiving volume is enveloped by lubricant,

[0015] in that the casing element protrudes past a sump height of a lubricant sump in a vertical direction, which lubricant sump forms in the housing interior during operation of the compressor.

[0016] When the compressor is in operation, during which the compressor is operated as intended for the compression of coolant, the lubricant sump forms in the housing interior, or more precisely in the base region of the housing interior. Usually by means of a crankshaft that is driven by the motor of the compressor/motor unit for the purpose of compressing coolant and extends sectionwise into the lubricant sump, lubricant is transported out of the lubricant sump in the direction of the compressor/motor unit in a manner known per se, in order to lubricate, among other things, a crankpin of the crankshaft, a connecting rod that produces an operative connection between the piston and crankpin, a bearing in which the crankshaft is mounted, and/or a cylinder wall of the cylinder, for example. The lubricant then drains out of the compressor/motor unit and is in this manner fed back to the lubricant sump.

[0017] The receiving element according to the invention, which internally accommodates the respectively paired spring element sectionwise for the purpose of tethering the same to the compressor housing, in particular to the mounting region of the compressor housing, enables the level of the lubricant to be increased in the respective region of the spring element without the need to raise the level of the lubricant sump overall. The lubricant present in the housing interior during operation can thus be used to dampen the spring elements.

[0018] This occurs in particular as a result of the casing element of the receiving element, which casing element prevents, at least to the greatest possible extent, a draining of lubricant that has collected in the receiving volume of the receiving element into the lubricant sump from the receiving element. In this sense, a draining of lubricant from the receiving element is prevented to the "greatest possible extent" if the degree of leak-tightness of the receiving element ensures that any outflow of lubricant from the receiving element, for example through porosities in the wall element, is not greater than the constant inflow of lubricant into the receiving element, which is open in the direction of the compressor/motor unit, which inflow is caused by the lubricant which spurts about the housing interior during operation of the compressor and which drains out of the compressor/motor unit. Thus, lubricant that drips off or drains out of the compressor/motor unit of the compressor and collects in the receiving volume of the receiving element initially remains in the interior of the receiving element and is hindered from exiting the receiving volume in the direction of the lubricant sump by the casing element of the receiving element. Because the receiving element protrudes past the sump height of the lubricant sump with its casing element in a vertical direction, the level of lubricant inside the receiving volume of the receiving element is, based in each case on a common reference point, considerably higher than in the lubricant sump.

[0019] This elevated level of the viscous lubricant (and oil) in the region of the spring elements ensures that the damping effect of the lubricant described at the outset can be optimally utilized, since a significantly larger vertical section of the spring elements can be placed under lubricant than is the case with known compressors, in which the height of the lubricant sump is limited by the factors also mentioned at the outset, in particular by the arrangement of the compressor/motor unit. As a result, an optimal damping of the spring elements can be achieved in the event of deflection, compression or expansion of the spring elements, and the noise emission caused by the vibration transmission of the spring elements can be considerably reduced. In addition, potential collisions between the receiving element and the compressor/motor unit, more precisely between the spring holder of the receiving element and an additional spring holder of the compressor/motor unit, which additional spring holder serves to secure the respective spring element to the compressor/motor unit and protrudes sectionwise into the spring element, are damped by a film of lubricant located between said parts.

[0020] Through a radial spacing of all other spring coils from the casing element of the receiving element except for first spring coils of the respective spring element as viewed in a vertical direction, which first spring coils can be embodied by the one, two or three spring coils of the spring element that are closest to the mounting region, it is ensured that the respective spring element is entirely surrounded on the outside thereof by lubricant, at least in the region of the other spring coils thereof. The damping effect described above is thus further enhanced. In this case, both the first spring coils and also the other spring coils of the spring element are located in the receiving volume of the receiving element in an operating state of the compressor, wherein in this operating state only the weight of the compressor/motor unit acts on the at least one spring element. Radial spacing of the spring coils from the casing element is thereby used to denote the distance that is perpendicular to the vertical direction and extends between the spring coils that are surrounded within the receiving element, and thus by the casing element, and the casing element.

[0021] In a preferred embodiment of the compressor according to the invention, it is provided that a minimum clear inner diameter of the casing element is larger than a maximum outer diameter of the spring element, so that all spring coils arranged within the receiving volume for the respective spring element are radially spaced from the casing element of the respective receiving element.

[0022] In this case, the spring element can be surrounded by lubricant in the region of the entire vertical section thereof extending inside the receiving element. In this embodiment of the compressor according to the invention, it is in particular provided that the first spring coils—and therefore all spring coils arranged within the receiving element—of the respective spring element are also spaced from the casing element. Movement of the spring is thus, at least in the case of smaller amplitudes, not impeded by the casing element. Collisions between the spring coils and the casing element of the receiving element are prevented to the greatest possible extent in compressors embodied in this manner. Particularly in connection with receiving elements that are embodied to be rigid, for example those made of metal, a considerable noise reduction can thus be achieved.

[0023] In another preferred embodiment of the compressor according to the invention, it is provided that, in the aforementioned operating state of the compressor, in which operating state the at least one spring element is loaded only with the weight of the compressor/motor unit, at least the first three spring coils (**21**, **22**), preferably 50% of the spring coils, particularly preferably more than 70% of the spring coils, of the spring element lie within the receiving volume (**32**) of the respective receiving element (**15**, **16**, **17**, **18**).

[0024] It is thus ensured that the lubricant collecting in the receiving volume can reach a level that is particularly beneficial for damping purposes in relation to the height of the spring element. In the preferred embodiment of the compressor, the lubricant level in the receiving volume is raised such that, even in the case of complete compression of the spring element, no spring coils of the spring element collide with one another outside of the receiving element—and therefore outside of the lubricant. All collisions taking place between spring coils are thus damped by the lubricant present in the receiving element. In this manner, an additional reduction of the noise emission is achieved.

[0025] In a preferred embodiment of the invention, it is provided that at least two of the spring coils of the respective spring element that lie within the receiving volume are spaced apart from one another such that a spring travel extends between them.

[0026] As a result, the damping effect achieved with the lubricant can be utilized even more efficiently.

[0027] In the aforementioned operating state of the compressor, the spring element is particularly preferably arranged within the receiving volume at least up to and including a transition region between active and passive spring coils. The non-spaced spring coils are thereby understood as being passive, and the spring coils spaced apart from one another are understood as being active.

[0028] Since the damping effect caused by the lubricant located in the receiving volume in the operating state of the compressor is the strongest in this transition region, an enhanced damping is achieved with such embodiments of the compressor according to the invention.

[0029] In another preferred embodiment of the compressor according to the invention, it is provided that the receiving element comprises a rod-like spring holder protruding from the receiving element in a vertical direction, via which spring holder the spring element is connected by the inner side thereof to the receiving element in a force fit.

[0030] With the spring holder of the receiving element, which spring holder is typically embodied as a securing pin with a diameter that tapers in a vertical direction, a particularly simple and at the same time reliable securing of the spring element to the receiving element—and therefore to the mounting region—is enabled. Especially if the spring element is embodied as a helical spring, a particularly simple and reliable fixing of the spring element to the receiving element can be achieved by sliding the helical spring onto the spring holder, provided that the diameter of the spring holder is matched to an inner diameter of the helical spring. The spring holder can thereby be embodied in one piece with a base element and the casing element of the receiving element, and can be pulled with a hollow inner section onto a raised piece of the compressor housing arranged in the base region, in order to secure the receiving element to the compressor housing. Alternatively, the receiving element can comprise an opening in the base element thereof embodied in one piece with the casing element, through which opening a rod-like part of the compressor housing protruding in a vertical direction from the base region extends into the receiving element. In such a case, the opening is matched to the protruding part of the compressor housing such that a leakage of lubricant from the receiving element is not possible, or is prevented to the greatest possible extent, in the region in which the protruding part and the opening contact one another.

[0031] In another embodiment of the invention, the base element can be formed by the mounting region of the compressor housing.

[0032] Particularly preferred is a further embodiment of the compressor according to the invention, in which embodiment the casing element protrudes past the spring holder of the receiving element in a vertical direction.

[0033] As a result, a maximization of the receiving volume of the receiving element for lubricant is achieved so that the receiving volume can accommodate multiple spring coils.

[0034] In order to reduce that portion of noise emission which can be attributed to the collision between the deflected spring element and the casing element of the receiving element, it is provided in another preferred embodiment of the invention that the casing element of the receiving element is embodied to be elastic.

[0035] In relation thereto, it is particularly advantageous if, as is provided in another preferred embodiment of the compressor according to the invention, at least the casing element, but preferably the entire receiving element, is made of an elastomer, particularly preferably of a fluoroelastomer. This material results in an increased service life of the receiving element, which is exposed on a sustained basis to extremely high temperatures and the lubricant itself during the operating state of the compressor.

[0036] In a particularly preferred embodiment of the compressor according to the invention, it is provided that a clear inner diameter of the casing element increases monotonically as viewed in a vertical direction, namely the clear inner diameter increases within the meaning of a monotonically increasing function of the vertical direction.

[0037] On the one hand, the receiving volume of the receiving element, in which receiving volume lubricant collects and can help dampen the spring element, is further increased by this measure. On the other hand, the fact that the amplitude of deflection of the spring element increases in the vertical direction is thus taken into account. It is thus ensured that the spring element does not contact the casing element, even in the case of extreme deflections of the spring element, for example during the start/stop process of the compressor/motor unit of the compressor. This is also accompanied by the reduction of that portion of the noise emission which is due to the collision between the deflected spring element and the casing element of the receiving element, which casing element is made of metal, for example.

[0038] It can be particularly advantageous if the casing element of the receiving element, which casing element surrounds the spring element and possibly the rod holder in a sleeve-like manner, is curved significantly outwardly at the end region thereof facing away from the compressor housing. To achieve the volume increase of the receiving element that accompanies a casing element embodied in such a manner, it is provided in another preferred embodiment of the compressor according to the invention that the casing element, as viewed in a cross-section running parallel to the vertical direction, has, at least sectionwise, the shape of a circular arc, wherein a circle corresponding to said circular arc has its center outside of the receiving element.

[0039] In a particularly preferred embodiment of the compressor according to the invention, it is provided that the casing element comprises a first vertical section and a second vertical section, wherein the first vertical section and the second vertical section each extend in a vertical direction, wherein a first clear inner diameter of the casing element is constant in the region of the first vertical section and wherein the second vertical section of the casing element comprises a diameter expansion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0040] The invention will now be explained in greater detail with the aid of exemplary embodiments. The drawings are by way of example and are intended to demonstrate, but in no way restrict or exclusively describe, the inventive concept.

[0041] In this matter:

[0042] FIG. **1** shows a sectional view of a compressor according to the invention

[0043] FIG. **2** shows a detailed view from FIG. **1**

[0044] FIG. **3** shows an embodiment of a receiving element according to the invention together with a spring element

[0045] FIG. **4** shows a top view of the housing base of the compressor from FIG. **1** with four receiving elements and associated spring elements

WAYS OF EMBODYING THE INVENTION

[0046] FIG. **1** shows a coolant compressor in a sectional view, wherein the section runs through the compressor housing **1** of the compressor. In a housing interior **2** surrounded by the compressor housing **1**, a compressor/motor unit **4** is arranged which primarily comprises a motor **8** and a cylinder **5** for compressing coolant, wherein the coolant can flow into the housing interior **2** via an inlet in the compressor housing **1**.

[0047] Via a connecting rod, a crankshaft **7** driven by the motor **8** is in operative connection with a piston **6** arranged in the cylinder **5** so that the rotation of the crankshaft **7** results in a periodic linear movement of the piston **6** between two dead centers of the cylinder **5**.

[0048] On a base region of the compressor housing **1** serving as a mounting region **34** of the compressor/motor unit **4**, four receiving elements **15**, **16**, **17**, **18** are provided (see FIG. **4**), of which only the receiving elements **15** and **16** can be seen in FIG. **1**. The receiving element **15** is thereby fabricated in one piece and comprises a base element **28** in contact with the mounting region **34**, a casing element **20** adjoining the base element **28**, and a spring holder **19** protruding from the base element **28** in a vertical direction **23**. The receiving element **15** is thereby pulled onto a raised piece **29** of the compressor housing **1** with a hollow space of the spring holder **19**, whereby the receiving element **15** is connected to the compressor housing **1** in a force fit. The casing element **20** encloses the spring holder **19** and a receiving volume **32** of the receiving element **15**, which receiving volume **32** is formed between the spring holder **19** and the casing element **20**, on the circumference or in a sleeve-like manner. The casing element **20** protrudes past the spring holder **19** in the vertical direction **23** (see also FIG. **2**).

[0049] FIG. **2** is a detailed view of the receiving element **15**. It can thereby be seen that a level of the lubricant **9** inside the receiving volume **32** of the receiving element **15** is noticeably higher than in a base region of the compressor housing **1**, where a lubricant sump **30** forms during the operation of the coolant compressor as intended, the maximum sump height **14** of which lubricant sump **30** is, however, limited by the position of the compressor/motor unit **4**. According to the invention, this is achieved in that the casing element **20** of the receiving element **15** protrudes past the sump height **14** of the lubricant sump **30** in the vertical direction **23**. The five spring coils, which are arranged within the receiving volume **32**, of the spring element **10** embodied as a helical spring, which spring element **10** is slid onto the spring holder **19** of the receiving element **15** for the purpose of securing and is fixed in this position in a force fit, are thus surrounded by lubricant **9**, whereby a damping of the vibrations caused by the compressor/motor unit **4** and transmitted to the compressor housing **1** via the spring element **10** is achieved. For the purpose of securing the spring element **10** to the receiving element **15**, the spring element **10** is slid onto the spring holder **19** of the receiving element and connected thereto in a force fit. Analogously, the spring element **10** is connected to the compressor/motor unit **4** via an additional spring holder **33** of the compressor/motor unit **4**.

[0050] In FIG. **2**, the casing element **20** surrounds the spring holder **19** of the receiving element **15** in a sleeve-like manner and has the same clear inner diameter when viewed across its entire height. In this embodiment, all spring coils of the spring element **10** embodied as a helical spring that are arranged within the receiving element **15** contact the casing element **20**. In embodiments of the coolant compressor in which the receiving elements are made of an elastomer, preferably of a fluoroelastomer, this noise-reduction effect is particularly pronounced, since this material exhibits the flexibility necessary therefor and also withstands on a sustained basis the high temperatures and the constant contact with lubricant **9**.

[0051] In contrast to the receiving element **15** shown in FIG. **2**, in FIG. **3** only first spring coils **21** of the spring element **10**—in this case: the first and second coils—are in contact with the casing element **20** of the receiving element **15** illustrated in FIG. **3**, so that other spring coils **22** of the spring element **10**, which other spring coils **22** are located farther away from the mounting region **34** of the compressor housing **1** than the first spring coils **21**, are radially spaced from the casing element **20** of the receiving element **15**.

[0052] For the purpose of the present invention, radial spacing is to be understood as meaning a distance perpendicular to the vertical direction, that is, the direction in which the spring element **10** and possibly the spring holder **19** protrude from the receiving element **15**, between a spring coil arranged within the receiving volume **32** and the section of the casing element **20** arranged at the same height as the respective spring coil.

[0053] In addition, the spacing of the other spring coils **22**—in this case: the third, fourth, and fifth coils—from the casing element **20** results in an additional reduction in noise emission by the coolant compressor overall, since noises that would be caused by the collision of the spring element **10** with the casing element **20** can be prevented to the greatest possible extent.

[0054] The casing element **20** of the receiving elements **15** from FIG. **3** comprises a first vertical section **25** arranged such that it runs in the vertical direction **23** and a second vertical section **26** which is arranged such that it also runs in the vertical direction **23**. A first clear inner diameter **27** of the casing element **20** embodied in a sleeve-like manner is constant over the entire first vertical section **25**. In its second vertical section **26**, however, the casing element **20** comprises a diameter expansion **24** proceeding continuously from the first clear inner diameter **27** all the way to a maximum clear inner diameter **31** that is reached at the upper end of the casing element **20**. It is thus ensured that the spring element **10** also cannot collide with the casing element **20** in the event of significant deflections.

[0055] FIG. **4** shows a top view of a base region of the compressor housing **1**. The receiving elements **15**, **16**, **17**, **18** are arranged in one mounting region **34** each of the compressor housing **1**. Each receiving element **15**, **16**, **17**, **18** thereby keeps one spring element **10**, **11**, **12**, **13** arranged. Together, the receiving elements **15**, **16**, **17**, **18**, which can be embodied according to the embodiments described above, and the spring elements **10**, **11**, **12**, **13** arranged therein form a mounting system **3** for the compressor/motor unit **4** of the compressor.

LIST OF REFERENCE NUMERALS

[0056] **1** Compressor housing
[0057] **2** Housing interior
[0058] **3** Mounting system
[0059] **4** Compressor/motor unit
[0060] **5** Cylinder
[0061] **6** Piston
[0062] **7** Crankshaft
[0063] **8** Motor
[0064] **9** Lubricant
[0065] **10**, **11**, **12**, **13** Spring element
[0066] **14** Sump height
[0067] **15**, **16**, **17**, **18** Receiving element
[0068] **19** Spring holder
[0069] **20** Casing element
[0070] **21** First spring coil
[0071] **22** Other spring coils
[0072] **23** Vertical direction
[0073] **24** Diameter expansion
[0074] **25** First vertical section
[0075] **26** Second vertical section
[0076] **27** First clear inner diameter
[0077] **28** Base element
[0078] **29** Raised piece
[0079] **30** Lubricant sump
[0080] **31** Maximum clear inner diameter
[0081] **32** Receiving volume
[0082] **33** Additional spring holder of the compressor/motor unit
[0083] **34** Mounting region

1. A compressor for compressing coolant circulating in a cooling circuit, comprising

a compressor housing enclosing a housing interior of the compressor,

a compressor/motor unit which comprises at least one piston, which moves in a cylinder, and a motor,

at least one spring element, preferably multiple spring elements, via which spring element the compressor/motor unit is attached in an elastically mounted manner to a mounting region of the compressor housing, preferably to a base region of the compressor housing, and

at least one receiving element arranged on the mounting region for the at least one spring element, preferably one receiving element for one spring element each, wherein the respective spring element is accommodated in the receiving element,

wherein the receiving element comprises a base element, which is connected to the mounting region and from which the spring element protrudes in a vertical direction, a casing element, which casing element surrounds the spring element in a sleeve-like manner, and a receiving volume bounded by the base element and the casing element, in order to enable a collection of lubricant in the receiving volume, so that a section of the spring element that is arranged in the receiving volume is enveloped by lubricant in the operating state of the compressor,

wherein

the casing element protrudes past a sump height of a lubricant sump in the vertical direction, which lubricant sump forms in the housing interior in the operating state of the compressor.

2. The compressor according to claim **1**, wherein a minimum clear inner diameter of the casing element is larger than a maximum outer diameter of the spring element.

3. The compressor according to claim **1**, wherein, in an operating state of the compressor, in which operating state the at least one spring element is loaded only with the weight of the compressor/motor unit, at least the first three spring coils, preferably 50% of the spring coils, particularly preferably more than 70% of the spring coils, of the spring element lie within the receiving volume of the respective receiving element.

4. The compressor according to claim **3**, wherein a spring travel extends between at least two of the spring coils of the respective spring element that lie within the receiving volume in the aforementioned operating state of the compressor.

5. The compressor according to claim **1**, wherein the receiving element comprises a rod-like spring holder protruding from the receiving element in the vertical direction, via which spring holder the spring element is connected by the inner side thereof to the receiving element in a force fit.

6. The compressor according to claim **5**, wherein the casing element protrudes past the spring holder of the receiving element in a vertical direction.

7. The compressor according to claim **1**, wherein the casing element of the receiving element is embodied to be elastic.

8. The compressor according to claim **1**, wherein at least the casing element, but preferably the entire receiving element, is made of an elastomer, particularly preferably of a fluoroelastomer.

9. The compressor according to claim **1**, wherein a clear inner diameter of the casing element increases monotonically as viewed in the vertical direction.

10. The compressor according to claim **9**, wherein the casing element comprises a first vertical section and a second vertical section, wherein the first vertical section and the second vertical section each extend in the vertical direction, wherein a first clear inner diameter of the casing element is constant in the region of the first vertical section and wherein the second vertical section the casing element comprises a diameter expansion.

11. The compressor according to claim **9**, wherein the casing element, as viewed in a cross-section running parallel to the vertical direction, has, at least sectionwise, the shape of a circular arc, wherein a circle corresponding to said circular arc has its center outside of the receiving element.

* * * * *