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(54) A VARIABLE SPEED COMPRESSOR

VERDICHTER MIT VARIABLER GESCHWINDIGKEIT

COMPRESSEUR À VÉLOCITÉ VARIABLE

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Description

[0001] The present invention relates to a variable speed compressor suitable for use in cooling devices.

[0002] The hermetic compressors which operate at a constant speed increases the energy consumption because of the constant capacity thereof due to the constant speed especially in cases when a lower cooling load is sufficient. Therefore, said constant speed compressors have been losing their competitiveness in the market. The ability of the variable capacity hermetic compressors to operate at different speeds provides important advantages in terms of energy efficiency, in addition to convenience provided for the user. Adjusting the speed according to the capacity requirements provide increased evaporation temperatures at lower speeds. Consequently, the efficiency is improved. However, since lower operating speeds overlap with the suspension frequency of the spring, resonance may occur. Thus, in the variable speed compressors, the problem of high-level vibration is encountered especially at lower speeds.

[0003] In the state of the art United Kingdom Patent Application No. GB540260, a cooling device comprising a compressor wherein the springs are fixed by means of a support member.

[0004] The document WO 2004/081379 discloses a support for a compressor consisting of a plate that is fixed to the lower casing by springs and the compressor is fixed to the plate by another set of springs.

[0005] The document DE 10 2021 113484 shows a support for a compressor consisting of two frames that are supported to one another by springs at their corners.

[0006] The aim of the present invention is the realization of a compressor providing ease of use, which is suitable for use in cooling devices.

[0007] The compressor realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a kit group, a lower casing on which the kit group is placed, and at least one spring provided between the lower casing and the kit group. By means of the spring provided between the kit group and the lower casing, the mechanical vibrations are prevented from being transferred to the shell. Thus, deformations and noises resulting from the vibrations are avoided.

[0008] The compressor of the present invention comprises at least one bracket provided on the lower casing and under the kit group. The brackets are positioned between the lower casing and the spring, and between the kit group and the spring. By means of the brackets, the suspension frequency of the spring is decreased. Thereby, the possibility of resonance is decreased, and the sound and the vibration are dampened.

[0009] In an embodiment of the present invention, the compressor comprises the bracket having a fixing hole provided at both ends thereof, and a spring housing between two fixing holes. The bracket is fixed onto the lower casing and the kit group by means of the fixing holes.

The spring is placed onto the spring housing. The spring housing is positioned almost in the middle of the two fixing holes.

[0010] In an embodiment of the present invention, the bracket is detachably attached to the lower casing and the kit group. The bracket is fixed through the fixing hole by means of a tool such as a screw. Thus, the bracket can be replaced when deformed.

[0011] In an embodiment of the present invention, the compressor comprises at least three brackets which are connected to each other. The brackets are connected to each other through the fixing hole.

[0012] In an embodiment of the present invention, the compressor comprises the bracket which is produced at least partially from a material with vibration dampening properties. Thus, a certain amount of vibrations transferred via the spring are dampened on the bracket. The vibrations are prevented from being transferred to the lower casing and the kit group. Thus, the kit group and the lower casing are prevented from being deformed, eliminating the generation of noise.

[0013] In an embodiment of the present invention, the compressor comprises the bracket produced from plastic material. By producing the bracket from plastic material, the mechanical strength thereof is enabled to be increased. Furthermore, the cost thereof is decreased.

[0014] In an embodiment of the present invention, the compressor is suitable for use in cooling devices.

[0015] By means of the present invention, a compressor with increased mechanical strength and decreased vibrations and noise is realized.

[0016] A compressor realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the perspective view of the compressor.

Figure 2 - is the perspective view of the brackets which are joined together.

Figure 3 - is the perspective view of the bracket.

[0017] The elements illustrated in the figures are numbered as follows:

1. Compressor
2. Kit group
3. Lower casing
4. Spring
5. Bracket
6. Fixing hole
7. Spring housing

[0018] The compressor (1) comprises a kit group (2), a lower casing (3) provided under the kit group (2), and at least one spring (4) arranged between the lower casing (3) and the kit group (2). The springs (4) are arranged between the lower casing (3) and the kit group (2). Generally, four springs (4) arranged on the corners of the lower casing (3) and the kit group (2) are used. By means

of the springs (4), the vibrations generated in the kit group (2) are prevented from being transferred, and transferred to the lower casing (3) with at least partially reduced amplitudes. Thus, the strength of the compressor (1) is increased, and the noise and the vibrations are decreased.

[0019] The compressor (1) of the present invention comprises at least one bracket (5) provided between the lower casing (3) and the spring (4), and between the kit group (2) and the spring (4). Since the suspension frequency of the springs (4) of the kit group (2) is decreased by means of the bracket (5) provided between the springs (4) and the lower casing (3) and between the springs (4) and the kit group (2), the risk of resonance is avoided. Thus, the amount of vibration transferred to the kit group (2) and the lower casing (3) is decreased. The springs (4) are prevented from resonating especially during vibrations at lower operational speeds. The noise is enabled to be decreased as the vibrations are decreased. The strength of the compressor (1) is improved.

[0020] In an embodiment of the present invention, the compressor (1) comprises the bracket (5) having a fixing hole (6) provided at both ends thereof, and a spring housing (7) arranged between two fixing holes (6). The bracket (5) is fixed onto the lower casing (3) and the kit group (2) through the fixing holes (6). The spring housing (7) is provided almost in the middle of the two fixing holes (6). The spring (4) is placed onto the spring housing (7). Thus, spring (4) is enabled to maintain its position while moving.

[0021] In an embodiment of the present invention, the compressor (1) comprises the bracket (5) which can be detachably attached to the lower casing (3) and the kit group (2). In an embodiment of the present invention, the bracket (5) can be detachably attached to the lower casing (3) and the kit group (2). Thus, the bracket (5) can be easily replaced when deformed.

[0022] In an embodiment of the present invention, the compressor (1) comprises at least three brackets (5) which are connected to each other. The brackets (5) are connected to each other through the fixing hole (6). At least three brackets (5) can be used. As the number of springs (4) and the distance between the springs (4) decrease, the costs are reduced, and the risk of resonance decreases as the frequency decreases.

[0023] In an embodiment of the present invention, the compressor (1) comprises the bracket (5) produced from a material which at least partially dampens vibrations. By producing the bracket (5) from a material which dampens vibrations, the vibrations transferred via the spring (4) are prevented from reaching the lower casing (3).

[0024] In an embodiment of the present invention, the compressor (1) comprises the bracket (5) which is produced from plastic material. By producing the bracket (5) from plastic material, the cost is decreased. Furthermore, the dynamic strength is improved and the risk of deformation is decreased.

[0025] In an embodiment of the present invention, the compressor (1) is suitable for use in cooling devices.

[0026] By means of the present invention, a variable

speed compressor (1) is realized, wherein brackets (5) preventing the springs (4) from resonating at lower vibration amplitudes are used. The vibrations on the springs (4) are decreased by means of the brackets (5) whereon the springs (4) are placed. Thereby, the efficiency and the economic life of the compressor (1) are increased.

Claims

1. A compressor (1) **comprising** a kit group (2), a lower casing (4) provided under the kit group (2) and at least one spring (4) arranged between the lower casing (3) and the kit group (2), at least one bracket (5) provided between the lower casing (3) and the spring (4), and between the kit group (2) and the spring (4) **characterized by** the bracket (5) having a fixing (6) hole provided at both ends thereof and a spring housing (7) arranged between two fixing holes (6).
2. A compressor (1) as in Claim 1, **characterized by** the bracket (5) which can be detachably attached to the lower casing (3) and the kit group (2).
3. A compressor (1) as in any one of the above claims, **characterized by** at least three brackets (5) which are connected to each other.
4. A compressor (1) as in any one of the above claims, **characterized by** the bracket (5) which is produced from material which dampens the vibrations at least partially.
5. A compressor (1) as in Claim 4, **characterized by** the bracket (5) which is produced from plastic material.
6. A compressor (1) as in any one of the above claims, which is suitable to be used in cooling devices.

Patentansprüche

1. Ein Kompressor (1) **umfasst** eine Bausatzeinheit (2), ein unter der Bausatzeinheit (2) vorgesehene unteres Feder (4) und mindestens eine zwischen dem unteren Gehäuse (3) und der Bausatzeinheit (2) angeordnete Feder (4), mindestens eine zwischen dem unteren Gehäuse (3) und der Feder (4) und zwischen der Bausatzeinheit (2) und der Feder (4) vorgesehene Halterung (5), **gekennzeichnet ist es dadurch**, dass die Halterung (5) an seinen beiden Enden ein Befestigungsloch (6) und ein zwischen zwei Befestigungslochern (6) angeordnetes Federgehäuse (7) aufweist.
2. Ein Kompressor (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** die Halterung

(5) lösbar an dem unteren Gehäuse (3) und der Bau-satz-einheit (2) befestigt werden kann.

adapté pour être utilisé dans des dispositifs de re-froidissement.

3. Ein Kompressor (1), wie in einem der vorherigen An-sprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** mindestens drei Halterungen (5) miteinander verbunden sind. 5
4. Ein Kompressor (1), wie in einem der vorherigen An-sprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** die Halterung (5) aus einem Material herge-stellt ist, das die Schwingungen zumindest teilweise dämpft. 10
5. Ein Kompressor (1), wie in Anspruch 4 aufgeführt, **ist dadurch gekennzeichnet, dass** die Halterung (5) aus Kunststoff hergestellt ist. 15
6. Ein Kompressor (1), wie in einem der vorherigen An-sprüchen aufgeführt, ist für den Einsatz in Kühlge-räten geeignet. 20

Revendications

1. Un compresseur (1) **comprenant** un groupe de kit (2), un boîtier inférieur (4) disposé sous le groupe de kit (2) et au moins un ressort (4) disposé entre le boîtier inférieur (3) et le groupe de kit (2), au moins une console (5) disposée entre le boîtier inférieur (3) et le ressort (4), et entre le groupe de kit (2) et le ressort (4), **caractérisé en ce que** la console (5) comporte un trou de fixation (6) fourni aux deux ex-trémités de celle-ci et un logement de ressort (7) disposé entre deux trous de fixation (6). 25
30
35
2. Un compresseur (1) tel que décrit dans la revendi-cation 1, **caractérisé par** la console (5) qui peut être fixée de manière détachable au boîtier inférieur (3) et au groupe de kit (2). 40
3. Un compresseur (1) tel que décrit dans l'une quel-conque des revendications précédentes, **caractéri-sé par** au moins trois consoles (5) qui sont reliées les unes aux autres. 45
4. Un compresseur (1) tel que décrit dans l'une quel-conque des revendications précédentes, **caractéri-sé par** la console (5) qui est fabriquée à partir d'un matériau qui amortit au moins partiellement les vi-brations. 50
5. Un compresseur (1) tel que décrit dans la revendi-cation 4, **caractérisé par** la console (5) qui est fa-briquée à partir de matériau plastique. 55
6. Un compresseur (1) tel que décrit dans l'une quel-conque des revendications précédentes, qui est

Figure 1

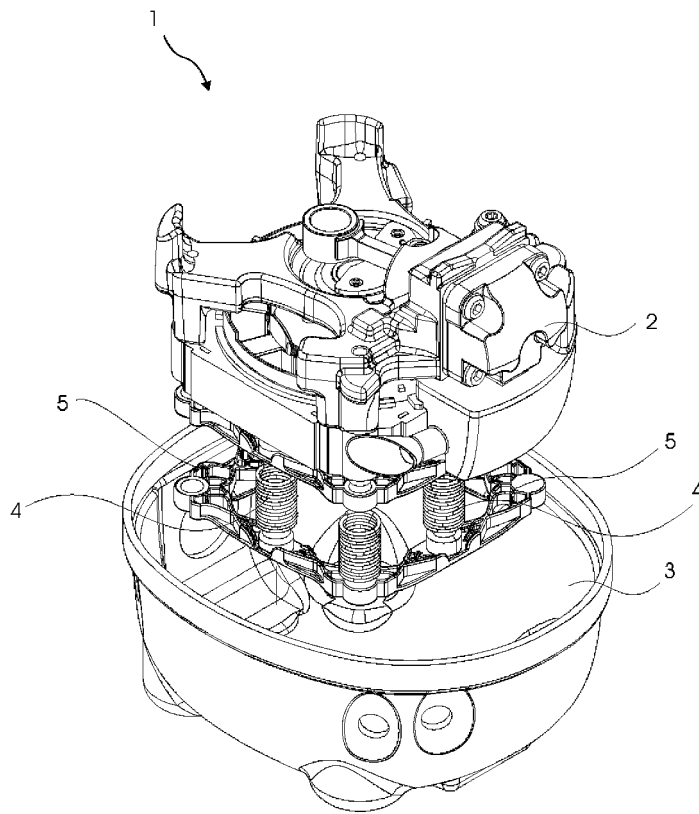


Figure 2

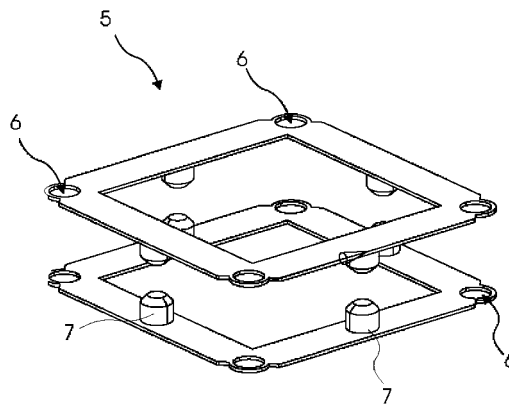
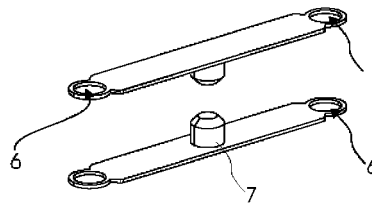


Figure 3



REFERENCES CITED IN THE DESCRIPTION

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