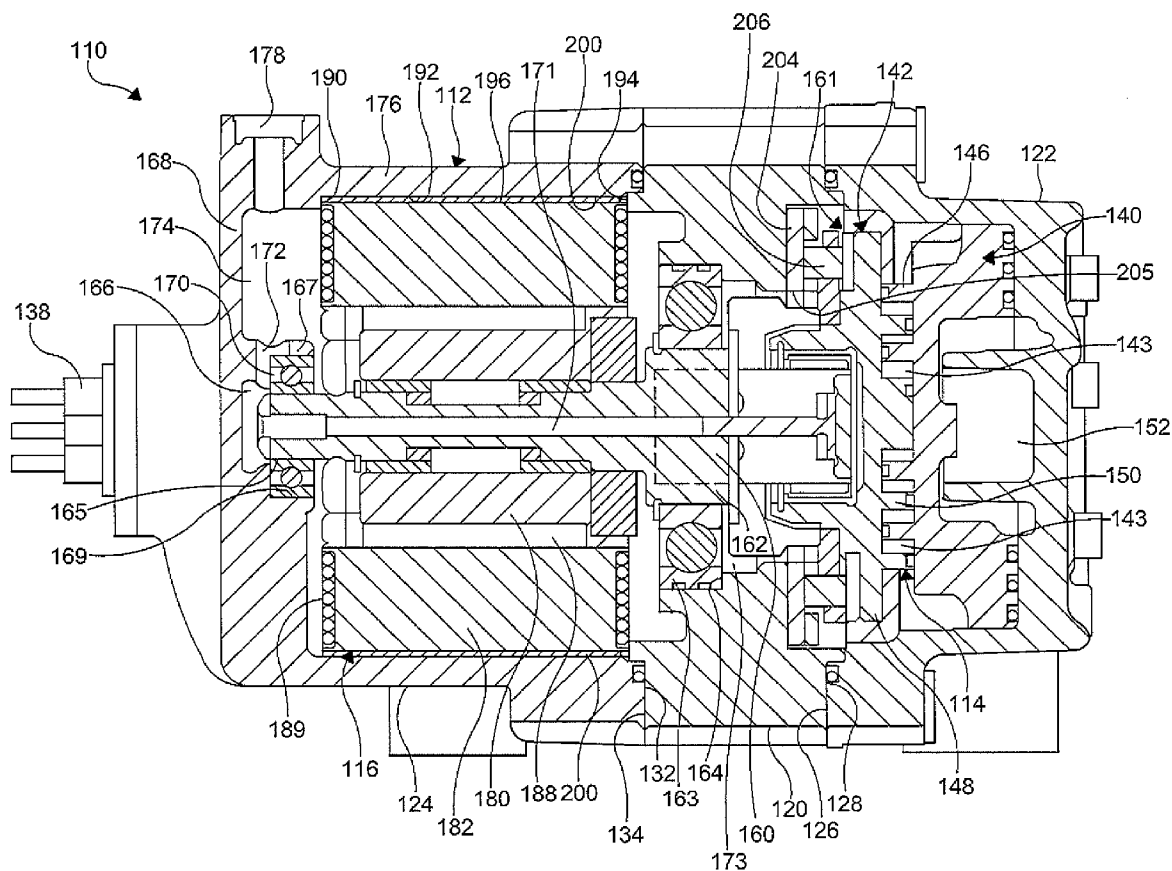


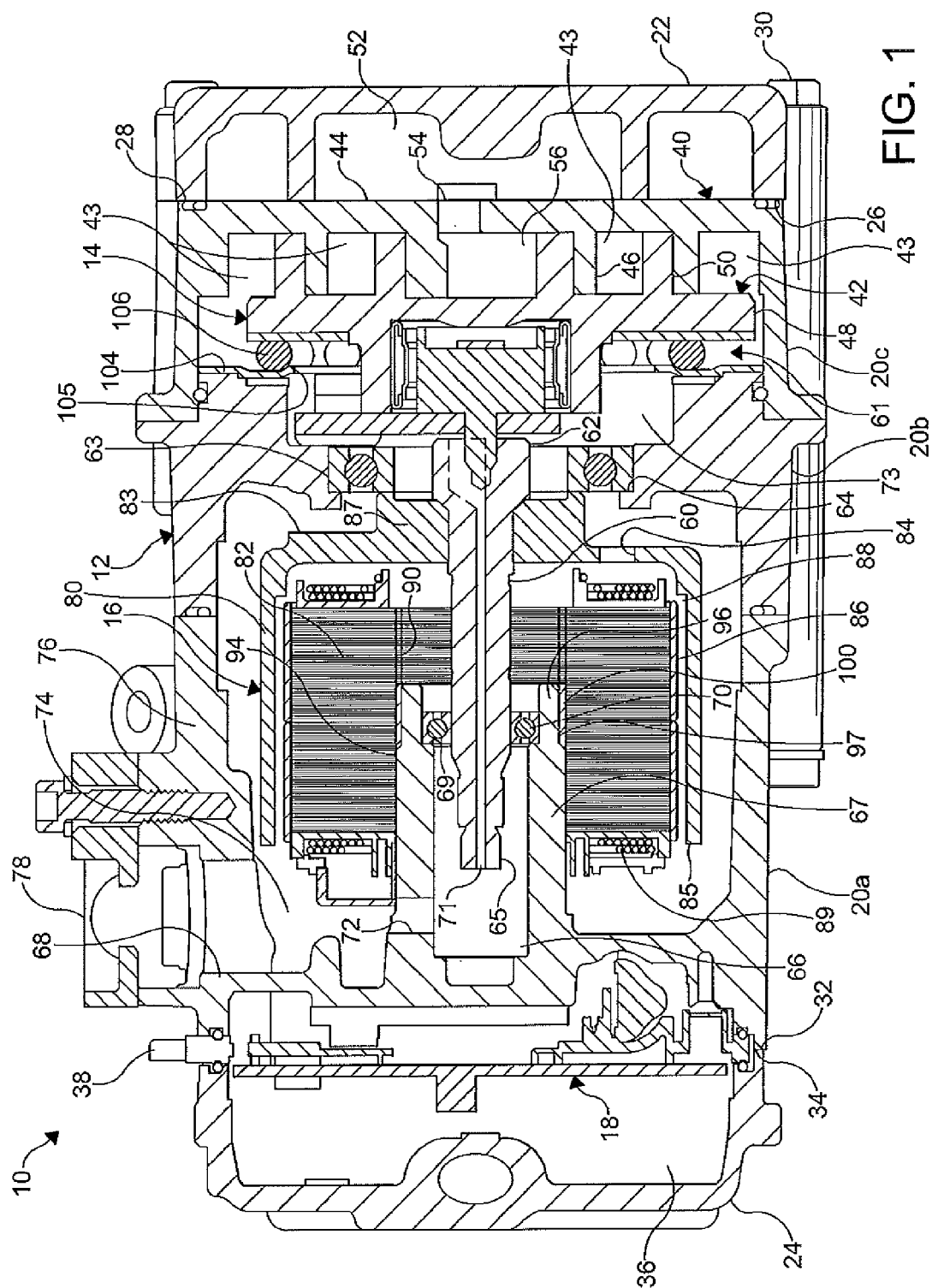


US 20120183422A1

(19) **United States**(12) **Patent Application Publication**
Bahmata(10) **Pub. No.: US 2012/0183422 A1**(43) **Pub. Date: Jul. 19, 2012**(54) **RETAINER FOR A STATOR OF AN
ELECTRIC COMPRESSOR****Publication Classification**(51) **Int. Cl.**
F04B 17/03 (2006.01)(52) **U.S. Cl.** **417/423.15**(57) **ABSTRACT**(75) **Inventor:** **Aurelian Bahmata**, South Lyon,
MI (US)(73) **Assignee:** **VISTEON GLOBAL
TECHNOLOGIES, INC.**, Van
Buren Twp., MI (US)(21) **Appl. No.:** **13/005,762**(22) **Filed:** **Jan. 13, 2011**

A compressor including a hollow housing having a compression mechanism and an electric motor disposed therein. The electric motor is coupled to the compression mechanism for facilitating a compression of a fluid received in the compressor. The electric motor including a rotor and a stator, wherein a position of the stator within the housing is maintained by a retainer removably disposed between the stator and the housing.





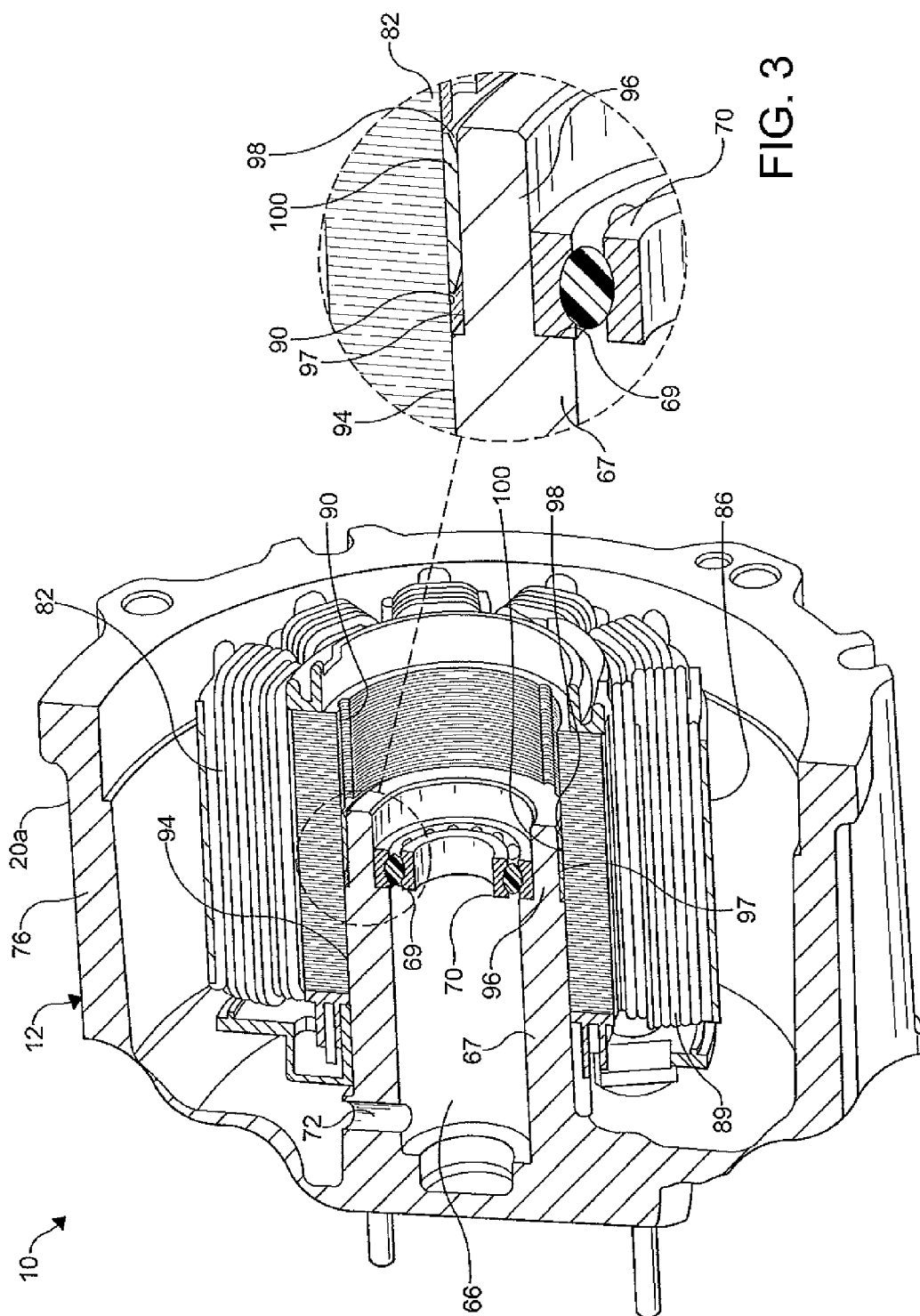


FIG. 2

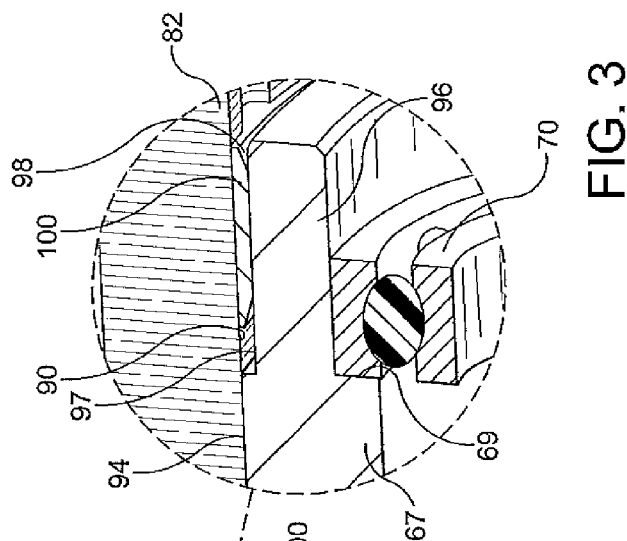


FIG. 3

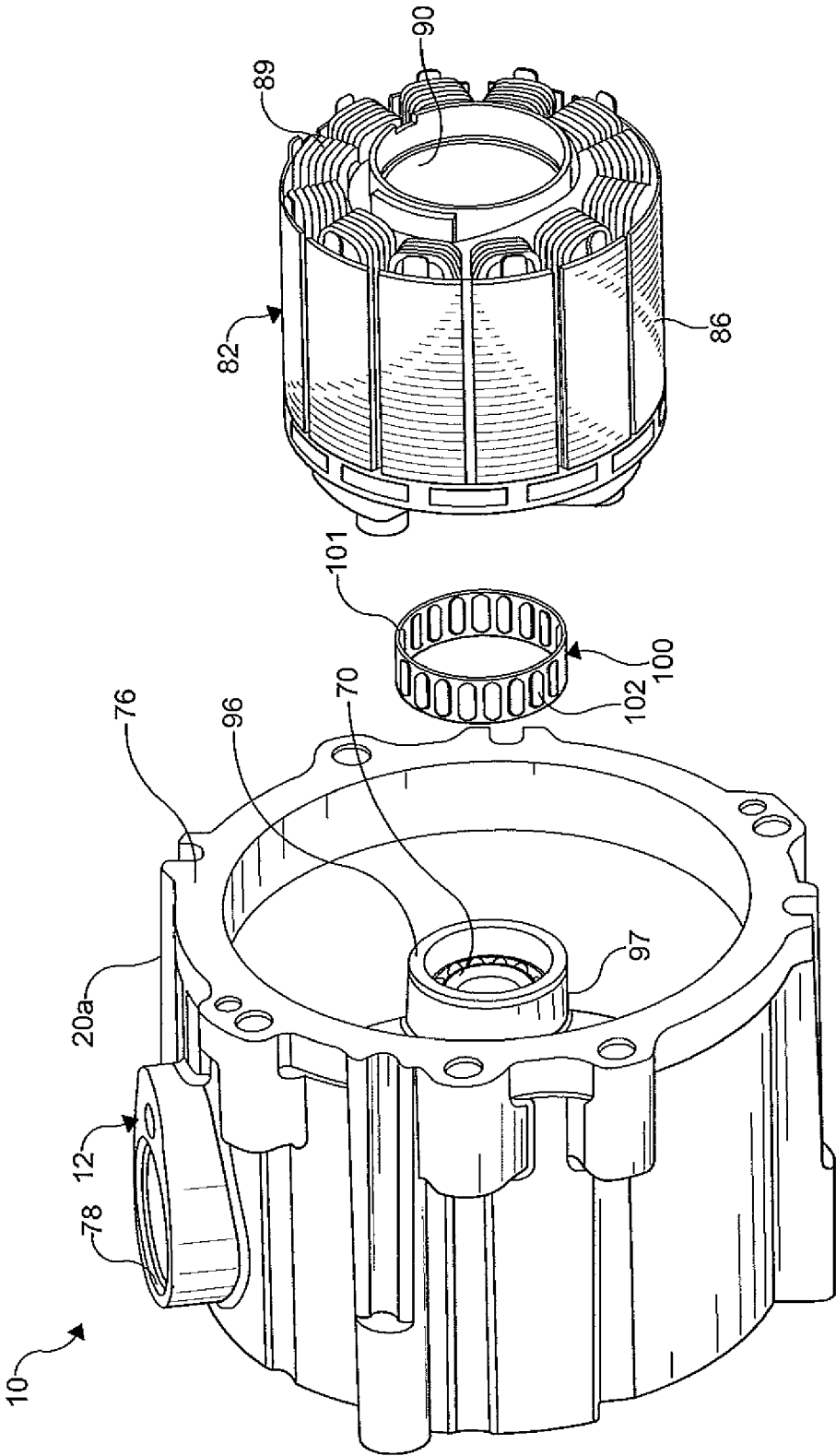
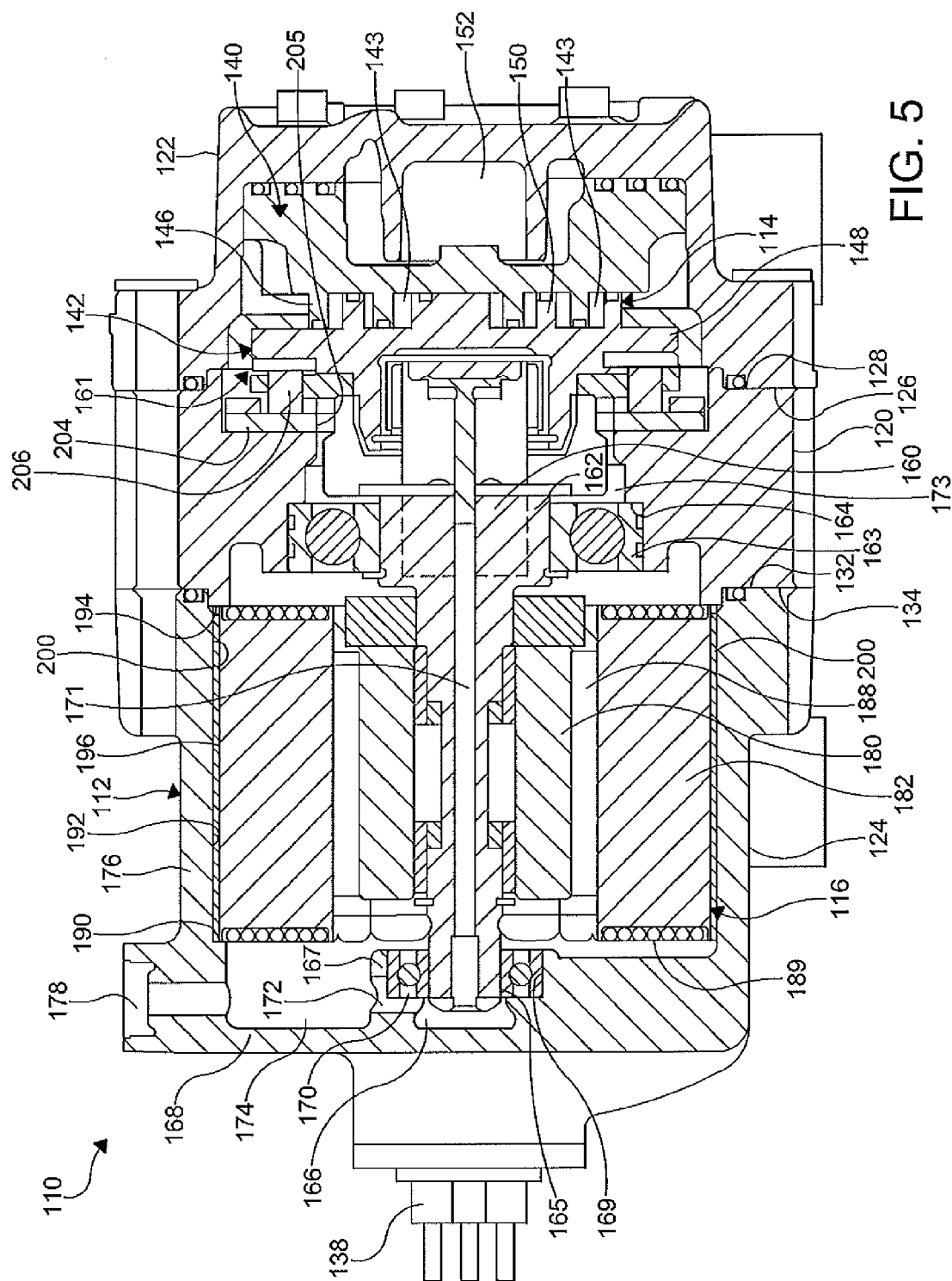


FIG. 4



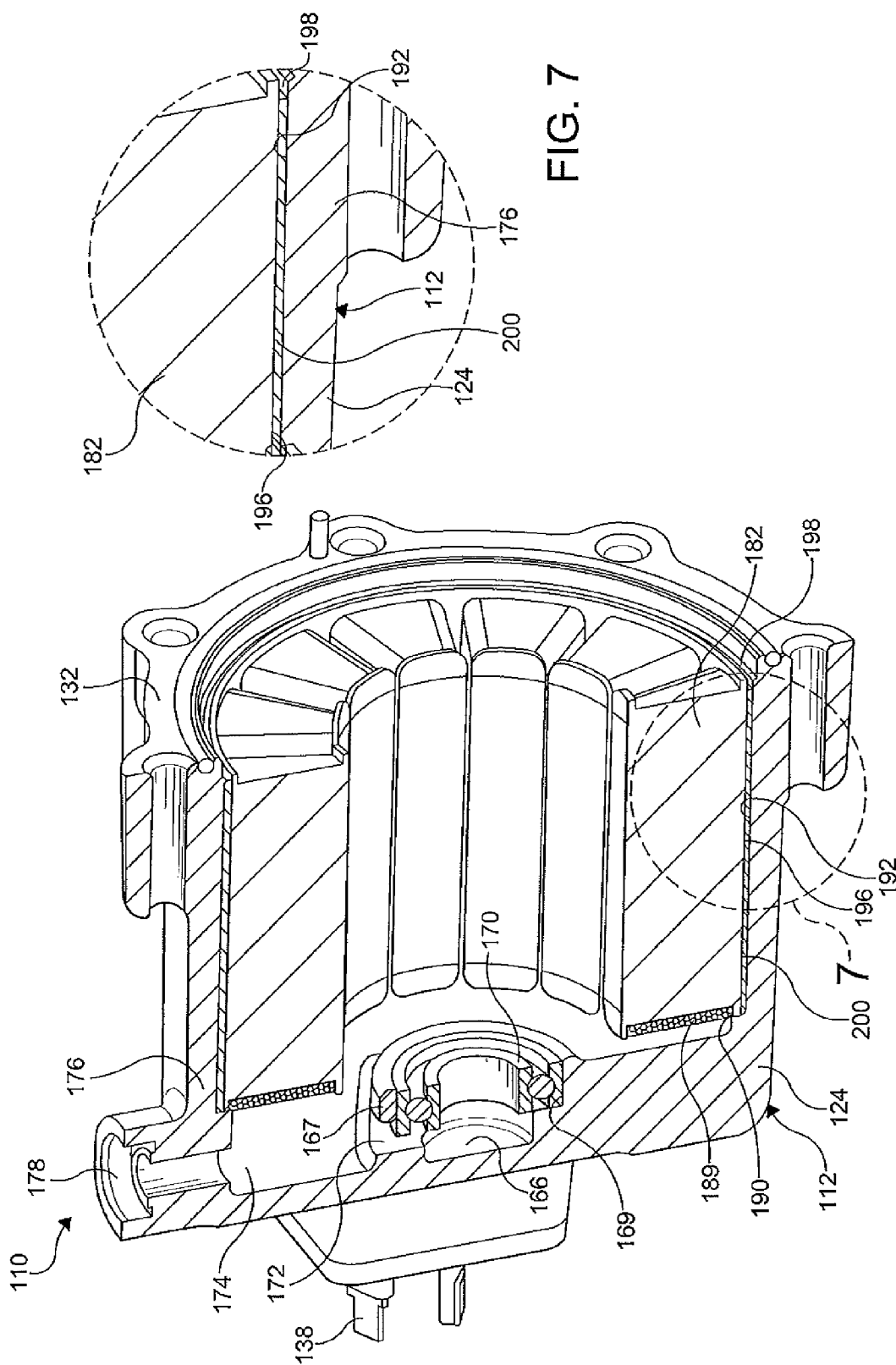


FIG. 7

FIG. 6

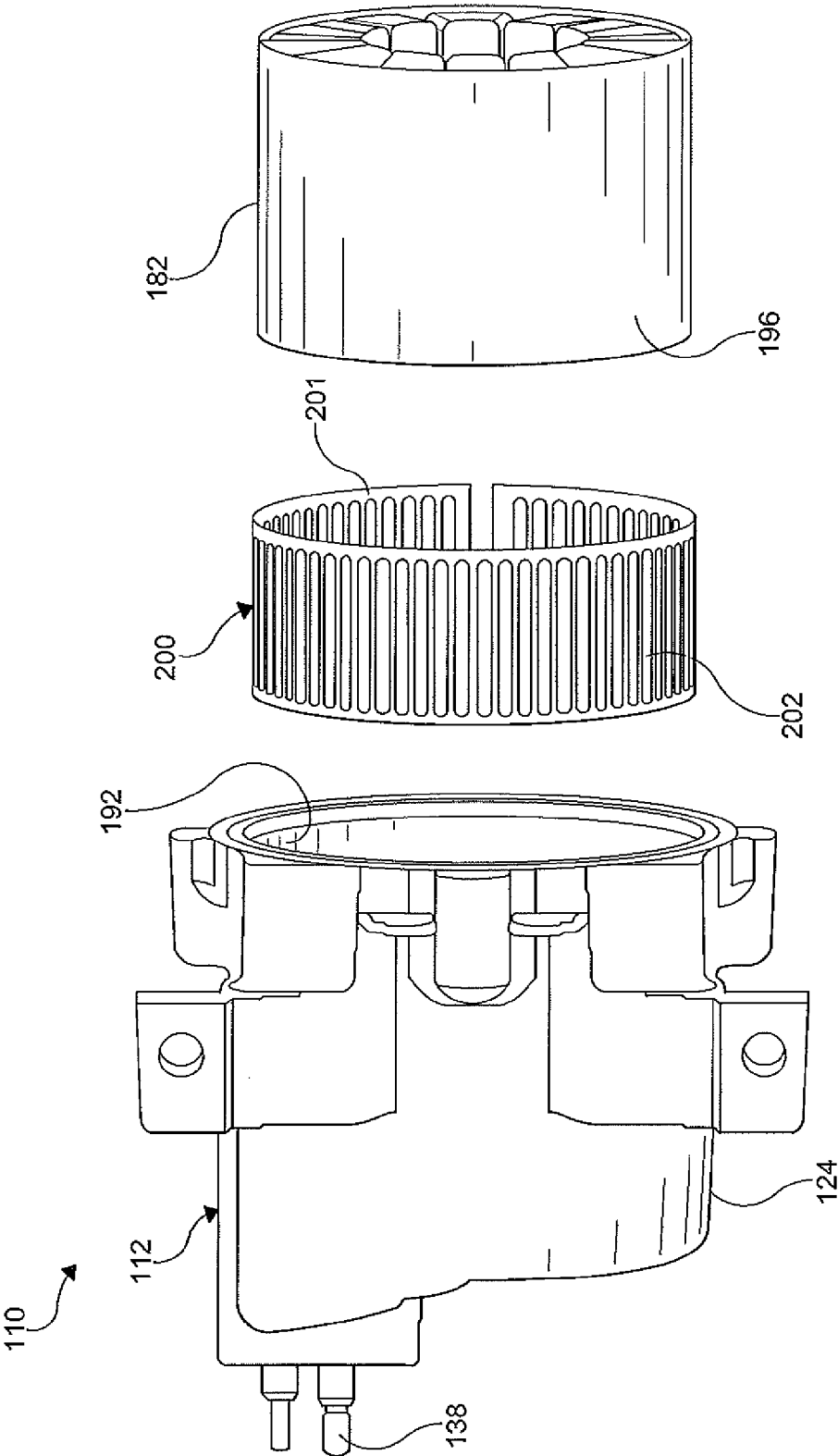


FIG. 8

RETAINER FOR A STATOR OF AN ELECTRIC COMPRESSOR

FIELD OF THE INVENTION

[0001] The present invention relates to a compressor. More particularly, the invention is directed to a compressor including an electric motor and a retainer for maintaining a position of a stator of the electric motor.

BACKGROUND OF THE INVENTION

[0002] Presently known hybrid vehicles utilize a combination of an electric drive motor and an internal combustion engine to power and propel the vehicle. Typically, the hybrid vehicles use an electric air conditioning compressor including a compression mechanism such as a scroll compression mechanism, for example, driven by an electric motor. The electric motor and the compression mechanism are mounted within a housing of the compressor. Packaging of the electric motor and the compression mechanism within the housing requires satisfying numerous design constraints such as weight, size, noise and vibration control, manufacturability, serviceability, and electric isolation. Current electric compressor designs satisfy only a few of the constraints.

[0003] The electric motor typically includes two primary components: a stator and a rotor. The stator is typically retained in the housing of the compressor by press-fitting the stator in the housing, attaching the stator to the housing fasteners, or capturing the stator by compressing the housing after installing the stator within the housing. The interface between the housing and the stator requires an accurate angular and axial positioning of the stator, a retention of the stator at low and high temperatures, a minimum stress on laminations of the stator, and an ease of assembly and serviceability.

[0004] It would be desirable to develop an electric compressor including a retainer for maintaining a position of a stator of the electric motor which facilitates a satisfaction of the design constraints of the packaging of the compressor and the requirements of the interface between the housing and the stator.

SUMMARY OF THE INVENTION

[0005] In concordance and agreement with the present invention, an electric compressor including a retainer for maintaining a position of a stator of the electric motor which facilitates a satisfaction of the design constraints of the packaging of the compressor and the requirements of the interface between the housing and the stator, has surprisingly been discovered.

[0006] In one embodiment, the compressor comprises: a hollow housing; a compression mechanism disposed in the housing, the compression mechanism receiving a fluid therein to be compressed; an electric motor removably disposed in the housing, the electric motor including a stator and a rotor coupled to the compression mechanism for facilitating a movement of the compression mechanism, wherein the movement of the compression mechanism causes a compression of the fluid therein; and a retainer removably disposed between the stator and the housing, the retainer configured to maintain a position of the stator within the housing and to dampen a noise and a vibration produced by the electric motor.

[0007] In another embodiment, the compressor comprises: a hollow housing; a compression mechanism disposed in the

housing, the compression mechanism receiving a fluid therein to be compressed; an electric motor removably disposed in the housing, the electric motor including a stator surrounding a rotor, the rotor coupled to the compression mechanism for facilitating a movement of the compression mechanism, wherein the movement of the compression mechanism causes a compression of the fluid therein; and an elastic retainer removably disposed between the stator and the housing, the retainer configured to maintain a position of the stator within the housing and to dampen a noise and a vibration produced by the electric motor.

[0008] In another embodiment, the compressor comprises: a hollow housing; a compression mechanism disposed in the housing, the compression mechanism receiving a fluid therein to be compressed; an electric motor removably disposed in the housing, the electric motor including a rotor surrounding a stator, the rotor coupled to the compression mechanism for facilitating a movement of the compression mechanism, wherein the movement of the compression mechanism causes a compression of the fluid therein; and a retainer disposed between the stator and the housing, the retainer configured to maintain a position of the stator within the housing and to dampen a noise and a vibration produced by the electric motor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The above, as well as other advantages of the present invention, will become readily apparent to those skilled in the art from the following detailed description of the preferred embodiment when considered in the light of the accompanying drawings in which:

[0010] FIG. 1 is a cross-sectional view of an electric compressor according to an embodiment of the present invention;

[0011] FIG. 2 is an enlarged fragmentary side perspective view, partially in section, of the compressor illustrated in FIG. 1 having a driveshaft of the compressor and a rotor of an electric motor removed;

[0012] FIG. 3 is an enlarged fragmentary perspective view, partially in section, of a portion of the compressor within the circled area of FIG. 2;

[0013] FIG. 4 is a partially exploded fragmentary side perspective view of the compressor illustrated in FIG. 1 having the driveshaft of the compressor and the rotor of the electric motor removed;

[0014] FIG. 5 is a cross-sectional view of an electric compressor according to another embodiment of the present invention;

[0015] FIG. 6 is an enlarged fragmentary side perspective view, partially in section, of the compressor illustrated in FIG. 5 having a driveshaft of the compressor and a rotor of an electric motor removed;

[0016] FIG. 7 is an enlarged fragmentary perspective view, partially in section, of a portion of the compressor within the circled area of FIG. 6; and

[0017] FIG. 8 is a partially exploded fragmentary side perspective view of the compressor illustrated in FIG. 5 having the driveshaft of the compressor and the rotor of the electric motor removed.

DETAILED DESCRIPTION OF THE INVENTION

[0018] The following detailed description and appended drawings describe and illustrate an exemplary embodiment of the invention. The description and drawings serve to enable

one skilled in the art to make and use the invention, and are not intended to limit the scope of the invention in any manner.

[0019] FIG. 1 shows a motor driven fluid compressor 10 according to an embodiment of the invention. It is understood that the motor driven compressor 10 can be any type of motor driven compressor as desired such as a motor driven scroll type fluid compressor, for example. The compressor 10 includes a compressor housing 12 having a compression mechanism 14, an electric motor 16, and an electric circuit 18 for controlling the electric motor 16 disposed therein. It is understood that the compression mechanism 14 can be any compression mechanism as desired such as a scroll type fluid compression mechanism, for example.

[0020] The compressor housing 12 comprises cylindrical portions 20a, 20b, 20c, a first end portion 22, and second end portion 24. An open side 26 of the first end portion 22 is releaseably and hermetically connected to an open side 28 of the cylindrical portion 20c. An open side 32 of the second end portion 24 is releaseably and hermetically connected to an open side 34 of cylindrical portion 20a. It is understood that the cylindrical portions 20a, 20b, 20c and the end portions 22, 24 can be connected by any means as desired such as adhesives, pins, clips, and the like, for example. A cavity 36 formed by the connected portions 24, 20a of the compressor housing 12 houses the electric circuit 18 therein. The electric circuit 18 is electrically connected with an external electric power source (not shown) via a terminal 38 disposed on the compressor housing 12.

[0021] In the embodiment shown, the compression mechanism 14 includes a fixed scroll 40 and a moveable scroll 42. The fixed scroll 40 includes an end plate 44 and a spiral element 46 extending laterally outwardly from the end plate 44. The moveable scroll 42 includes an end plate 48 and a spiral element 50 extending laterally outwardly from the end plate 48. The spiral element 46 of the fixed scroll 40 cooperates with the spiral element 50 of moveable scroll 42, which is angularly and radially offset therefrom, to form a plurality of sealed fluid pockets 43.

[0022] The end plate 44 of the fixed scroll 40 and the first end portion 22 of the compressor housing 12 define a discharge chamber 52 therebetween. A valved outlet port 54 axially formed through the end plate 44 of the fixed scroll 40 fluidly connects the discharge chamber 52 to a central fluid pocket 56 defined by the scrolls 40, 42. A discharge port (not shown) is formed in the first end portion 22 of the compressor housing 12. The discharge port fluidly connects the discharge chamber 52 to an inlet 48 of another component (not shown) such as a condenser of a heating, ventilating, and air conditioning system, for example.

[0023] As illustrated, the moveable scroll 42 is mechanically coupled to the electric motor 16 by a rotatable driveshaft 60. A rotation preventing mechanism 61 is disposed between the cylindrical portion 20b of the compressor housing 12 and a face of the end plate 48 of the moveable scroll 42 opposite the spiral element 50. The rotation preventing mechanism 62 includes a ring-shaped member 104 having a central opening 105 formed therein and a plurality of bearing members 106. During a rotational movement of the driveshaft 60, the moveable scroll 42 is caused to revolve. As the moveable scroll 42 revolves, the bearing members 106 cooperate with the ring-shaped member 104 to militate against a rotational movement of the moveable scroll 42 and facilitate an orbital movement thereof.

[0024] A first end 62 of the driveshaft 60 is supported by a bearing 63 seated adjacent an annular shoulder 64 formed in an inner surface of the cylindrical portion 20b of the compressor housing 12. A second end 65 of the driveshaft 60 is disposed in a first cavity 66 formed by an annular hub 67. The annular hub 67 extends laterally outwardly from an interior wall 68 of the cylindrical portion 20a of the compressor housing 12. An end portion 96 of the annular hub 67 includes an inner annular shoulder 69 and an outer annular shoulder 97 formed therein. A bearing 70 for supporting the driveshaft 60 in the first cavity 66 is seated adjacent the inner annular shoulder 69 of the end portion 96 of the annular hub 67.

[0025] The driveshaft 60 includes an axial bore 71 extending therethrough. The axial bore 71 fluidly connects a second cavity 73 formed in the compressor housing 12 to the first cavity 66. An aperture 72 formed in the annular hub 67 fluidly connects the first cavity 66 to a suction chamber 74. The suction chamber 74 shown is formed by the interior wall 68 and an outer peripheral wall 76 of the cylindrical portion 20a of the compressor housing 12. A suction port 78 is formed in the outer peripheral wall 76 of the cylindrical portion 20a of the compressor housing 12. The suction port 76 fluidly connects the suction chamber 74 to an outlet of another component (not shown) such as an evaporator of a heating, ventilating, and air conditioning system, for example.

[0026] The electric motor 16 includes a rotor 80 and a stator 82. In the embodiment shown, the rotor 80 is generally campanular shaped having a substantially closed end 83 and a substantially open end 85. The closed end 83 includes an aperture 84 formed therein and a neck portion 87 circumscribing and drivingly connected to the driveshaft 60. The open end 85 of the rotor 80 receives the stator 82 therein, wherein an outer peripheral surface 86 of the stator 82 is surrounded by the rotor 80. An air gap 88 is formed between the rotor 80 and the outer peripheral surface 86 of the stator 82 to permit rotational movement of the rotor 80 around the stator 82. Windings 89 of the stator 82 are in electrical communication with the electric circuit 18 via a wiring harness (not shown) extending outwardly from a coil end of the stator 82 adjacent the open end 85 of the rotor 80.

[0027] The stator 82 is removeably positioned on the annular hub 67 of the cylindrical portion 20a of the compressor housing 12. As illustrated in FIGS. 2-3, an inner surface 90 of the stator 82 abuts an outer surface of an intermediate portion 94 of the annular hub 67. The inner surface 90 of the stator 82 and the outer annular shoulder 97 of the end portion 96 of the annular hub 67 are spaced apart forming an annular interstice 98 therebetween. A retainer 100 is removeably disposed in the interstice 98 to maintain an axial position and a radial position of the stator 82. As shown in FIG. 4, the retainer 100 is a thin elastic strip or annular band 101 having an array of spaced apart retaining features 102 extending radially outwardly therefrom. It is understood that the retaining features 102 can be detents, waves, corrugations, or protuberances formed therein. It is further understood that the retaining features 102 can be formed to face inwardly or outwardly to accommodate different physical properties of the stator 82, the compressor housing 12, and the retainer 100. The retaining features 102 exert a holding force on the stator 82 and the compressor housing 12, while facilitating an ease of assembly therebetween. The holding force of the retainer 100 results from a force produced by the retaining features 102 being elastically deflected during the assembly of the retainer 100 between the stator 82 and the compressor housing 12. A

holding capability of the retainer **100** is determined by the retaining features **102** and a coefficient of friction between the retainer **100** and the stator **82**, and the compressor housing **12**. The holding capability of the retainer **100** can be varied by adjusting a thickness of the strip **101**, a pitch of the retaining features **102**, a height of the retaining features **102**, and a number of the retaining features **102**, for example. It is understood that the retainer **100** can be produced from any suitable material such as a metallic material, a non-metallic material, an elastomeric material, or any combination thereof, for example.

[0028] The retainer **100** is configured to maintain the axial and radial position of the stator **82** within the compressor housing **12** without requiring additional assembly means or processes such as fasteners, a press-fitting process, a compression of the compressor housing **12** process, and the like, for example. The retainer **100** is also configured to permit the electric motor **16** to be easily installed in the compressor housing **12**, removed from the compressor housing **12**, or replaced by another electric motor. The retainer **100** can be any retainer as desired such as a tolerance ring, a bushing, a sleeve, and the like, for example. It is understood that the retainer **100** can be integrally formed with the annular hub **67** of the compressor housing **12** if desired. The retainer **100** can be tuned to dampen noise and vibration frequencies produced by the electric motor **16**. The retainer **100** shown is tuned by modifying physical properties of the retainer **100** such as a material composition, a thickness, a width, and a shape and configuration thereof, for example. It is understood that the annular hub **67** can also be tuned to dampen noise and vibration frequencies of the electric motor **16** such as by modifying physical properties of the annular hub **67** such as a diameter thereof, for example.

[0029] During operation of the compressor **10**, a fluid such as a refrigerant gas, for example, flows from an external fluid source through the suction port **78** into the suction chamber **74** of the compressor **10**. A first portion of the fluid in the suction chamber **74** flows through the aperture **72** formed in the annular hub **67** into the first cavity **66**. The first portion of the fluid then flows from the first cavity **66** into and through the bore **71** of the driveshaft **60** into the second cavity **73**. A second portion of the fluid in the suction chamber **74** flows through the aperture **72** formed in the annular hub **67** into the first cavity **66**. From the first cavity **66**, the second portion of the fluid flows through the bearing **70** and the stator **82**, and through the aperture **84** of the closed end **83** of the rotor **80**. After flowing through the aperture **84**, the second portion of the fluid then flows through the bearing **63** and into the second cavity **73**. A third portion of the fluid in the suction chamber **74** flows around an outside of the electric motor **16** through the bearing **63** and into the second cavity **73**. All portions of the fluid in the second cavity **73** then flow through the rotation preventing mechanism **161** via the central opening **105** of the ring-shaped member **104**, and into the outer sealed fluid pockets **43** of the compression mechanism **14**. Once in the sealed fluid pockets **43**, the fluid undergoes a resultant volume reduction and compression, and is caused to flow towards the central fluid pocket **56**. Finally, the compressed fluid is discharged through the outlet port **54** into the discharge chamber **52**. The fluid then flows from the discharge chamber **52** through the discharge port to an external component.

[0030] FIG. 5 shows a motor driven fluid compressor **110** according to an embodiment of the invention. It is understood that the motor driven compressor **110** can be any type of

motor driven compressor as desired such as a motor driven scroll type fluid compressor, for example. The compressor **110** includes a compressor housing **112** having a compression mechanism **114** and an electric motor **116** disposed therein. It is understood that the compression mechanism **114** can be any compression mechanism as desired such as a scroll type fluid compression mechanism, for example.

[0031] The compressor housing **112** comprises a cylindrical portion **120**, a first end portion **122**, and second end portion **124**. An open side **126** of the first end portion **122** is releaseably and hermetically connected to a first open side **128** of the cylindrical portion **120**. An open side **132** of the second end portion **124** is releaseably and hermetically connected to a second open side **134** of the cylindrical portion **120**. It is understood that the cylindrical portion **120** and the end portions **122**, **124** can be connected by any means as desired such as adhesives, pins, clips, and the like, for example. A terminal **138** for controlling and providing electrical communication to the electric motor **116** is disposed in the second end portion **124** of the compressor housing **112**. The terminal **138** is in electrical communication with an external electric power source (not shown).

[0032] In the embodiment shown, the compression mechanism **114** includes a fixed scroll **140** and a moveable scroll **142**. The fixed scroll **140** includes a spiral element **146** extending laterally outwardly therefrom. The moveable scroll **142** includes an end plate **148** and a spiral element **150** extending laterally outwardly from the end plate **148**. The spiral element **146** of the fixed scroll **140** cooperates with the spiral element **150** of moveable scroll **142**, which is angularly and radially offset therefrom, to form a plurality of sealed fluid pockets **143**.

[0033] The fixed scroll **140** and the first end portion **122** of the compressor housing **112** define a discharge chamber **152** therebetween. A valved outlet port (not shown) axially formed through the fixed scroll **140** fluidly connects the discharge chamber **152** to a central fluid pocket (not shown) defined by the scrolls **140**, **142**. A discharge port (not shown) is formed in the first end portion **122** of the compressor housing **112**. The discharge port fluidly connects the discharge chamber **152** to an inlet of another component (not shown) such as a condenser of a heating, ventilating, and air conditioning system, for example.

[0034] As illustrated, the moveable scroll **142** is mechanically coupled to the electric motor **116** by a rotatable driveshaft **160**. A rotation preventing mechanism **161** is disposed between the cylindrical portion **120** of the compressor housing **112** and a face of the end plate **148** of the moveable scroll **142** opposite the spiral element **150**. The rotation preventing mechanism **161** includes a ring-shaped member **204** having a central opening **205** formed therein and a plurality of bearing members **206**. During a rotational movement of the driveshaft **160**, the moveable scroll **142** is caused to revolve. As the moveable scroll **142** revolves, the bearing members **206** cooperate with the ring-shaped member **204** to militate against a rotational movement of the moveable scroll **142** and facilitate an orbital movement thereof.

[0035] A first end **162** of the driveshaft **160** is supported by a bearing **163** seated adjacent an annular shoulder **164** formed in an inner surface of the cylindrical portion **120** of the compressor housing **112**. A second end **165** of the driveshaft **160** is disposed in a first cavity **166** formed by an annular hub **167**. The annular hub **167** extends laterally outwardly from an end wall **168** of the second end portion **124** of the compressor

housing 112. The annular hub 167 includes an inner annular shoulder 169 formed therein. A bearing 170 seated adjacent the inner annular shoulder 169 of the annular hub 167 supports the driveshaft 160 in the first cavity 166.

[0036] The driveshaft 160 includes an axial bore 171 extending therethrough. The axial bore 171 fluidly connects a second cavity 173 formed in the cylindrical portion 120 to the first cavity 166. An aperture 172 formed in the annular hub 167 fluidly connects the first cavity 166 to a suction chamber 174. The suction chamber 174 shown is formed by the end wall 168 and an outer peripheral wall 176 of the second end portion 124 of the compressor housing 112. A suction port 178 is formed in the outer peripheral wall 176 of the second end portion 124 of the compressor housing 112. The suction port 178 fluidly connects the suction chamber 174 to an outlet of another component (not shown) such as an evaporator of a heating, ventilating, and air conditioning system, for example.

[0037] The electric motor 116 includes a rotor 180 and a stator 182. In the embodiment shown, the rotor 180 is generally annular shaped circumscribing and drivingly connected to the driveshaft 160. The rotor 180 is received in a central passage of the annular-shaped stator 182, wherein the stator 182 surrounds an outer peripheral surface of the rotor 180. An air gap 188 is formed between the rotor 180 and the stator 182 to permit rotational movement of the rotor 180 within the central passage of the stator 182. Windings 189 of the stator 182 are in electrical communication with the terminal 138 via a wiring harness (not shown) extending outwardly from a coil end of the stator 182.

[0038] The stator 182 is removeably positioned between a shoulder 190 formed in an inner peripheral surface 192 of the second end portion 124 of the compressor housing 112 and an annular shoulder 194 formed in the open side 134 of the cylindrical portion 120 of the compressor housing 112. As illustrated in FIGS. 6-7, an outer surface 196 of the stator 182 and the inner peripheral surface 192 of the second end portion 124 are spaced apart forming an annular interstice 198 therebetween. A retainer 200 is removeably disposed in the interstice 198 to maintain an axial position and a radial position of the stator 182. The retainer 200 may be disposed adjacent the shoulder 190 formed in the inner peripheral surface 192 of the second end portion 124 of the compressor housing 112 and the annular shoulder 194 formed in the open side 134 of the cylindrical portion 120 of the compressor housing 112 to maintain an axial position thereof.

[0039] As shown in FIG. 8, the retainer 200 is a thin elastic strip or annular band 201 having an array of spaced apart retaining features 202 extending radially outwardly therefrom. It is understood that the retaining features 202 can be detents, waves, corrugations, or protuberances formed therein. It is further understood that the retaining features 202 can be formed to face inwardly or outwardly to accommodate different physical properties of the stator 182, the compressor housing 112, and the retainer 200. The retaining features 202 exert a holding force on the stator 182 and the compressor housing 112, while facilitating an ease of assembly therebetween. The holding force of the retainer 200 results from a force produced by the retaining features 202 being elastically deflected during the assembly of the retainer 200 between the stator 182 and the compressor housing 112. A holding capability of the retainer 200 is determined by the retaining features 202 and a coefficient of friction between the retainer 200 and the stator 182, and the compressor housing 112. The

holding capability of the retainer 200 can be varied by adjusting a thickness of the strip 201, a pitch of the retaining features 202, a height of the retaining features 202, and a number of the retaining features 202, for example. It is understood that the retainer 200 can be produced from any suitable material such as a metallic material, a non-metallic material, an elastomeric material, or any combination thereof, for example. It is understood that the retainer 200 can be produced from any suitable material such as a metallic material, a non-metallic material, an elastomeric material, or any combination, for example.

[0040] The retainer 200 is configured to maintain the axial and radial position of the stator 182 within the compressor housing 112 without requiring additional assembly means or processes such as fasteners, a press-fitting process, a compression of the compressor housing 112 process, and the like, for example. The retainer 200 is also configured to permit the electric motor 116 to be easily installed in the compressor housing 112, removed from the compressor housing 112, or replaced by another electric motor. The retainer 200 can be any retainer as desired such as a bushing, a sleeve, and the like, for example. It is understood that the retainer 200 can be integrally formed with the second end portion 124 of the compressor housing 112 if desired. The retainer 200 can be tuned to dampen noise and vibration frequencies produced by the electric motor 116. The retainer 200 shown is tuned by modifying physical properties of the retainer 200 such as a material composition, a thickness, a width, and a shape and configuration thereof, for example.

[0041] During operation of the compressor 100, a fluid such as a refrigerant gas, for example, flows from an external fluid source through the suction port 178 into the suction chamber 174 of the compressor 110. A first portion of the fluid flows through the aperture 172 formed in the annular hub 167 into the first cavity 166. The first portion of the fluid then flows from the first cavity 166 into and through the bore 171 of the driveshaft 160 into the second cavity 173. A second portion of the fluid in the suction chamber 174 flows through the central passage of the stator 182 and around the rotor 180 of the electric motor 116. The second portion of the fluid in the central passage of the stator 182 then flows through the bearing 163 and into the second cavity 173. Both of the portions of the fluid in the second cavity 173 then flow through the rotation preventing mechanism 161 via the central opening 205 of the ring-shaped member 204, and into the outer sealed fluid pockets 143 of the compression mechanism 114. Once in the sealed fluid pockets 143, the fluid undergoes a resultant volume reduction and compression, and is caused to flow towards the central fluid pocket. Finally, the compressed fluid is discharged through the outlet port into the discharge chamber 152. The fluid then flows from the discharge chamber 152 through the discharge port to an external component.

[0042] From the foregoing description, one ordinarily skilled in the art can easily ascertain the essential characteristics of this invention and, without departing from the spirit and scope thereof, make various changes and modifications to the invention to adapt it to various usages and conditions.

What is claimed is:

1. A compressor comprising:
 - a hollow housing;
 - a compression mechanism disposed in the housing, the compression mechanism receiving a fluid therein to be compressed;

an electric motor removeably disposed in the housing, the electric motor including a stator and a rotor coupled to the compression mechanism for facilitating a movement of the compression mechanism, wherein the movement of the compression mechanism causes a compression of the fluid therein; and

a retainer removably disposed between the stator and the housing, the retainer configured to maintain a position of the stator within the housing and to dampen a noise and a vibration produced by the electric motor.

2. The compressor according to claim 1, wherein the rotor surrounds the stator.

3. The compressor according to claim 1, wherein the stator surrounds the rotor.

4. The compressor according to claim 1, wherein the housing includes a wall having an annular hub extending outwardly therefrom, the annular hub configured to receive the retainer thereon.

5. The compressor according to claim 4, wherein the retainer is disposed in an interstice formed between the stator and the annular hub of the housing.

6. The compressor according to claim 1, wherein the retainer is disposed adjacent at least one annular shoulder formed in the housing to maintain an axial position thereof.

7. The compressor according to claim 1, wherein the retainer is a strip of material having retaining features formed therein.

8. The compressor according to claim 1, wherein the retainer is tuned to dampen the noise and the vibration produced by the electric motor by adjusting a physical property of the retainer.

9. The compressor according to claim 4, wherein the annular hub is tuned to dampen the noise and the vibration produced by the electric motor by adjusting a physical property of the annular hub of the housing.

10. A compressor comprising:

a hollow housing;

a compression mechanism disposed in the housing, the compression mechanism receiving a fluid therein to be compressed;

an electric motor removeably disposed in the housing, the electric motor including a stator surrounding a rotor, the rotor coupled to the compression mechanism for facilitating a movement of the compression mechanism, wherein the movement of the compression mechanism causes a compression of the fluid therein; and

an elastic retainer removably disposed between the stator and the housing, the retainer configured to maintain a

position of the stator within the housing and to dampen a noise and a vibration produced by the electric motor.

11. The compressor according to claim 10, wherein the retainer is disposed adjacent at least one annular shoulder formed in a wall of the housing to maintain an axial position thereof.

12. The compressor according to claim 10, wherein the retainer is an annular strip of material having retaining features formed therein.

13. The compressor according to claim 10, wherein the retainer is tuned to dampen the noise and the vibration produced by the electric motor by adjusting a physical property of the retainer.

14. A compressor comprising:

a hollow housing;

a compression mechanism disposed in the housing, the compression mechanism receiving a fluid therein to be compressed;

an electric motor removeably disposed in the housing, the electric motor including a rotor surrounding a stator, the rotor coupled to the compression mechanism for facilitating a movement of the compression mechanism, wherein the movement of the compression mechanism causes a compression of the fluid therein; and

a retainer disposed between the stator and the housing, the retainer configured to maintain a position of the stator within the housing and to dampen a noise and a vibration produced by the electric motor.

15. The compressor according to claim 14, wherein the retainer is disposed in an interstice formed between the stator and an annular hub formed in a wall of the housing.

16. The compressor according to claim 14, wherein the retainer is removably disposed between the stator and the housing.

17. The compressor according to claim 14, wherein the retainer is integrally formed with the housing.

18. The compressor according to claim 14, wherein the retainer is a strip of material having retaining features formed therein.

19. The compressor according to claim 14, wherein the retainer is tuned to dampen the noise and the vibration produced by the electric motor by adjusting a physical property of the retainer.

20. The compressor according to claim 15, wherein the annular hub is tuned to dampen the noise and the vibration produced by the electric motor by adjusting a physical property of the annular hub of the housing.

* * * * *