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(54) AIR COMPRESSOR

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(63) Continuation-in-part of application No. 10/805,987, filed on Mar. 22, 2004, now Pat. No. 6,994,529. Continuation-in-part of application No. 11/053,033, filed on Feb. 8, 2005, now Pat. No. 6,991,437, which is a continuation-in-part of application No. 10/630,090, filed on Jul. 30, 2003, now Pat. No. 6,994,528, which is a continuation of application No. 10/154,416, filed on May 23, 2002, now Pat. No. 6,942,464, and which is a continuation-in-part of application No. 29/136,877, filed on Feb. 8, 2001, now Pat. No. D,461,196.

(60) Provisional application No. 60/366,676, filed on Mar. 22, 2002.

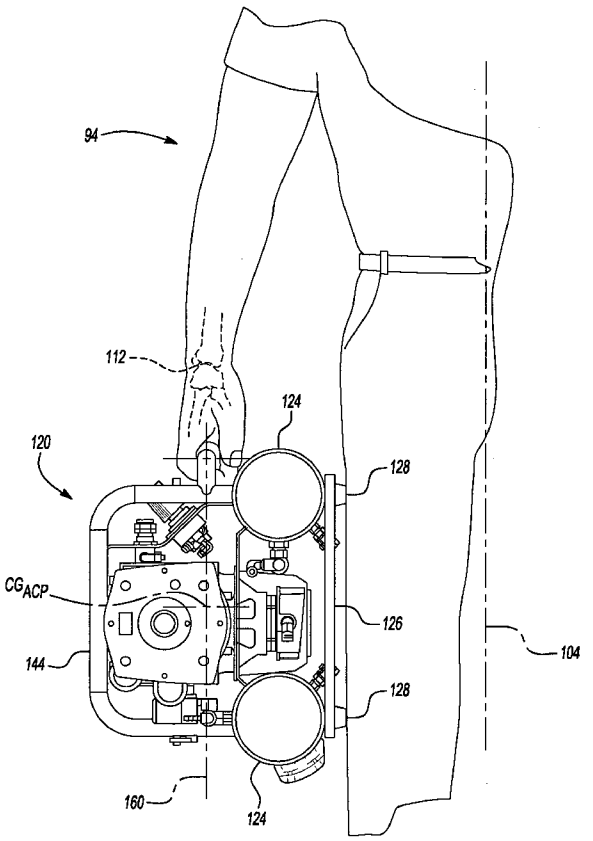
Publication Classification

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(57) **ABSTRACT**

An air compressor having improved stability and portability. The air compressor package is positionable in an operational position, wherein the air compressor package is positioned on a base, and a transport position, wherein the air compressor package may be more readily transported. Positioning of the air compressor package into the transport position is accomplished by rotating the air compressor about a rotational axis that is generally parallel to the longitudinal axis of the air tank, which positions the air compressor in an orientation and position that is relatively comfortable, whether or not the air compressor is hand-transported. The air compressor package can employ a compact manifold that can couple the air tank to the compressor and a regulator valve and optionally to a relief valve, a drain valve and/or a pressure switch. A method for operating a compressor is also provided.



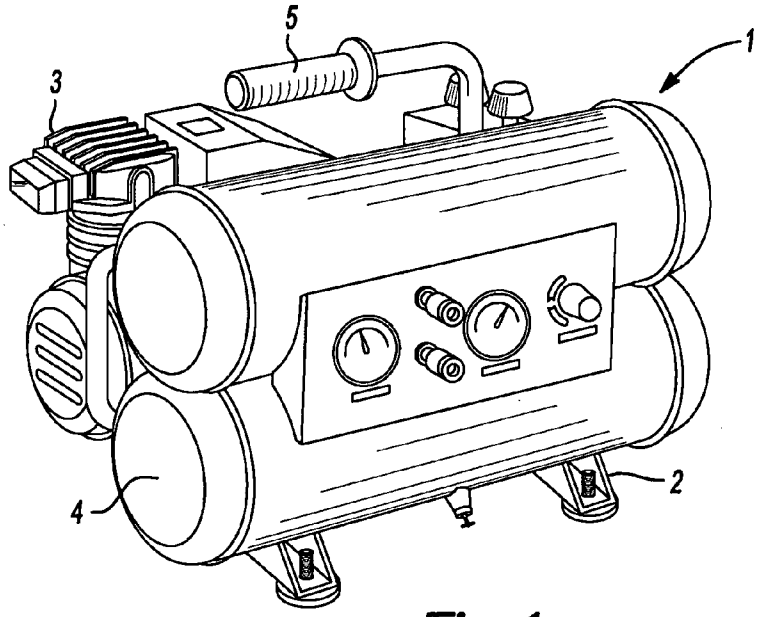


Fig-1
PRIOR ART

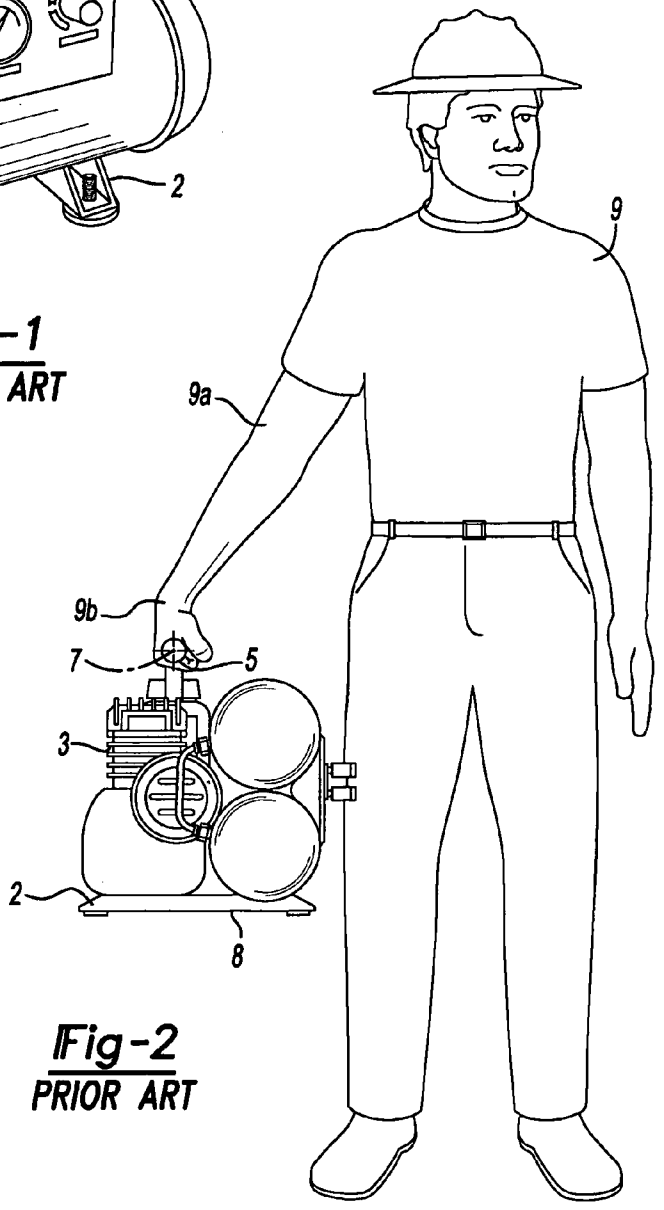


Fig-2
PRIOR ART

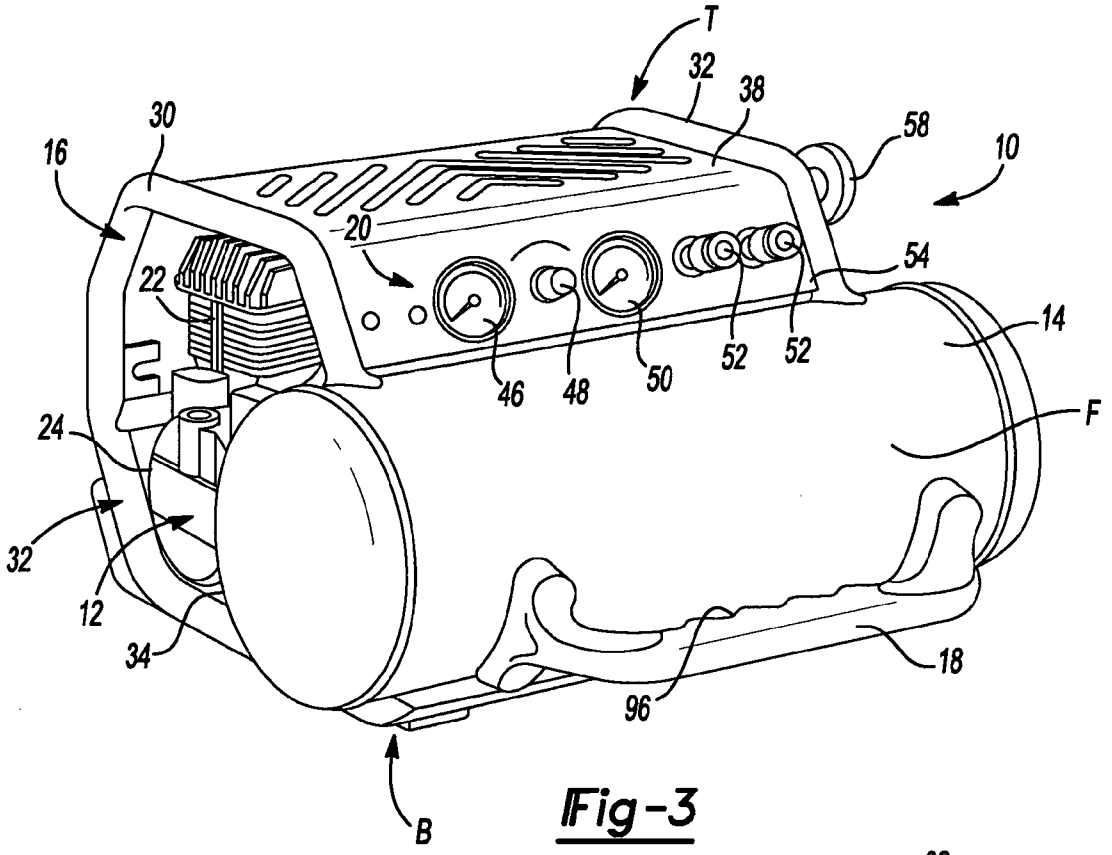

T
32
38
58
10
30
16
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22
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14
46
48
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52
52
F
24
32
12
34
18
96
B

Fig-3

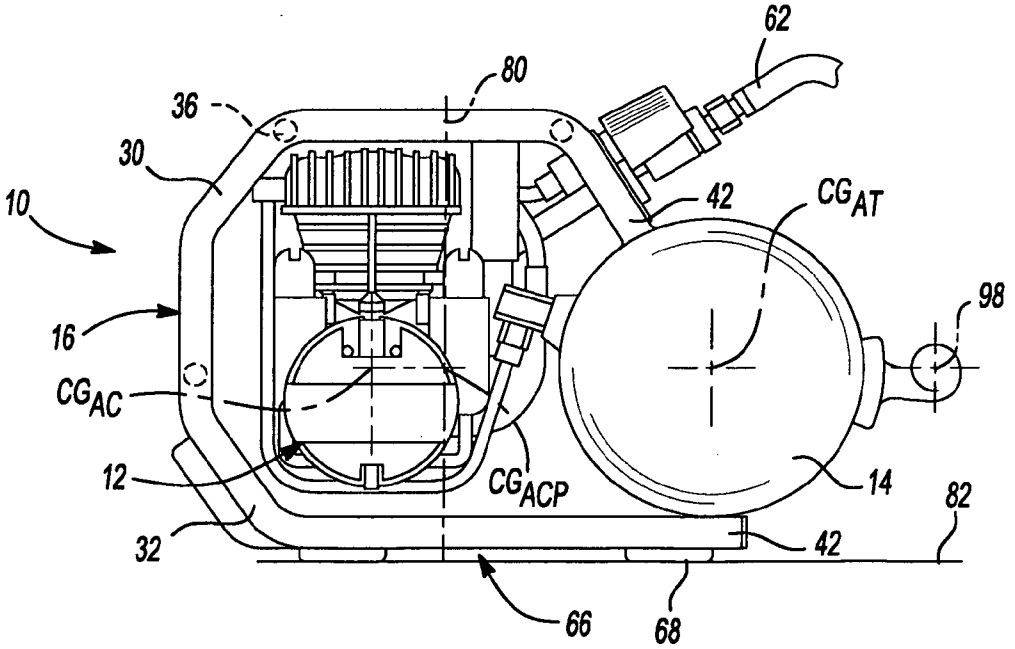

62
80
36
30
10
42
CG_{AT}
98
16
CG_{AC}
12
CG_{ACP}
14
82
32
42
66
68

Fig-4

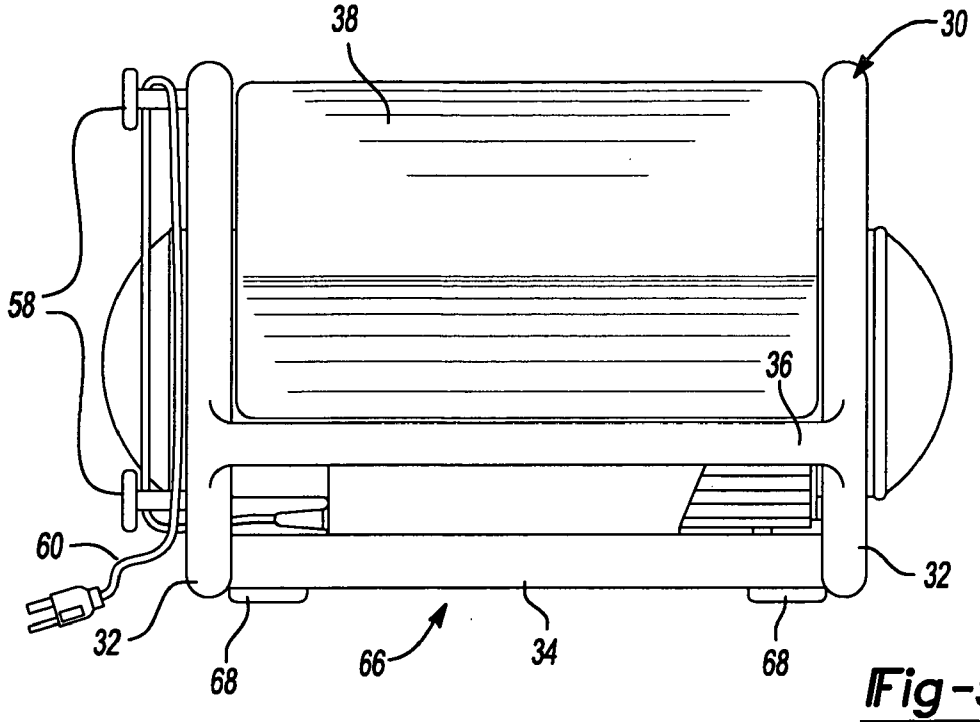


Fig-5

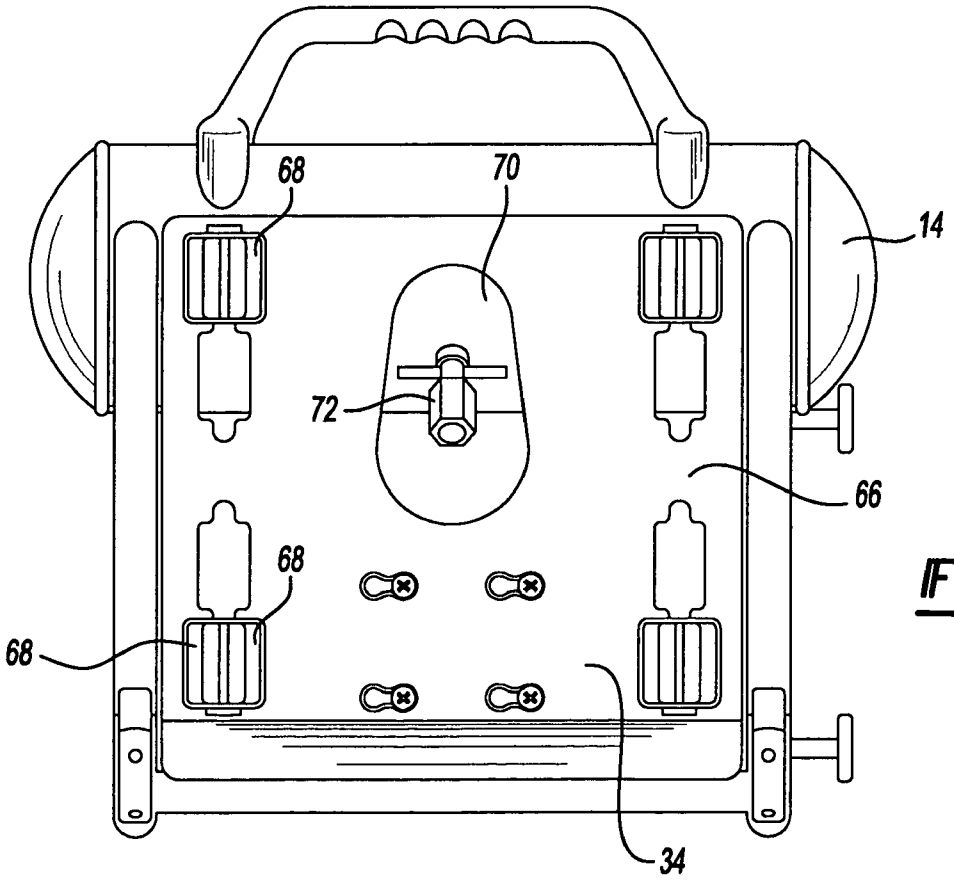


Fig-6

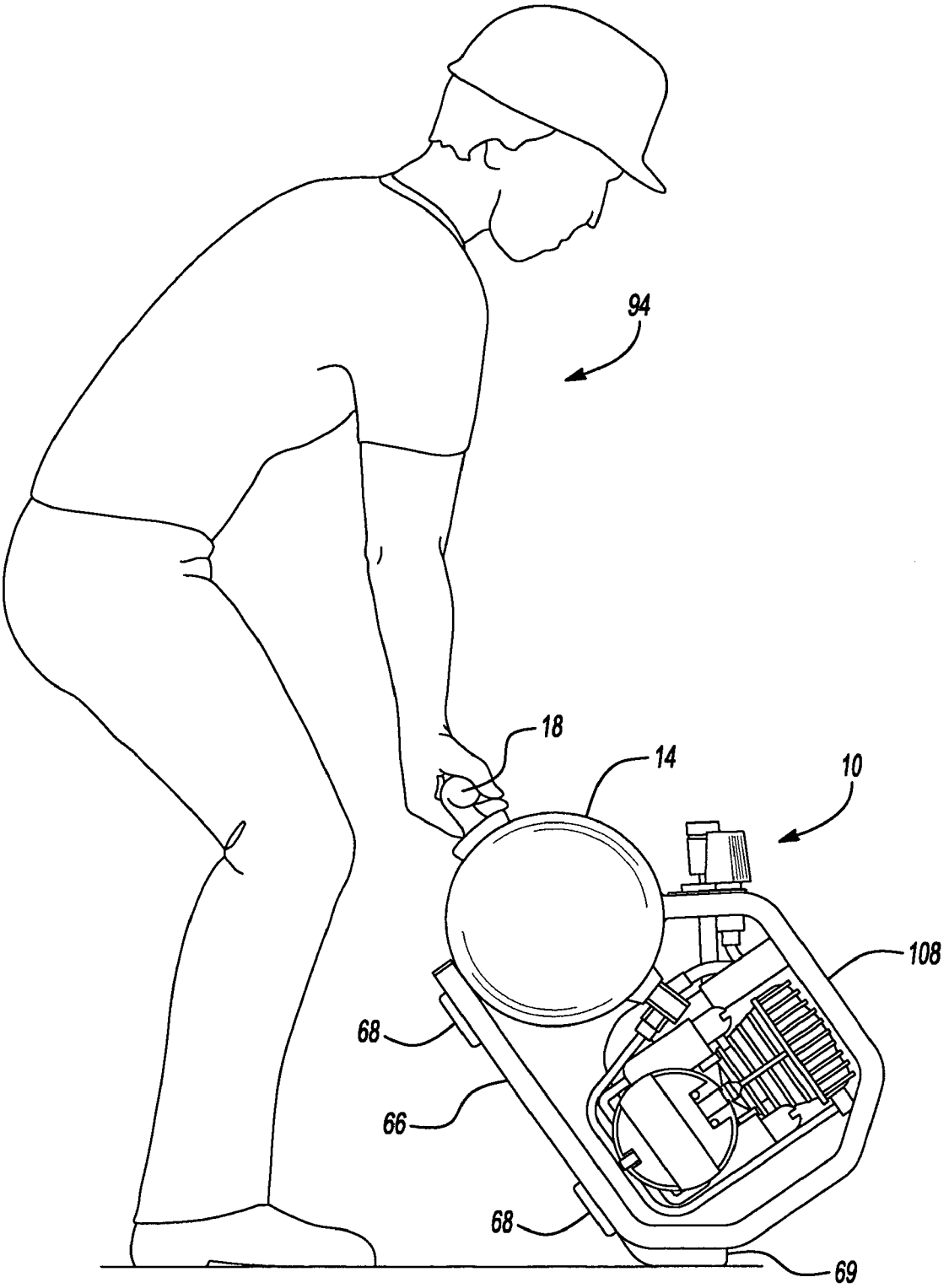


Fig-7A

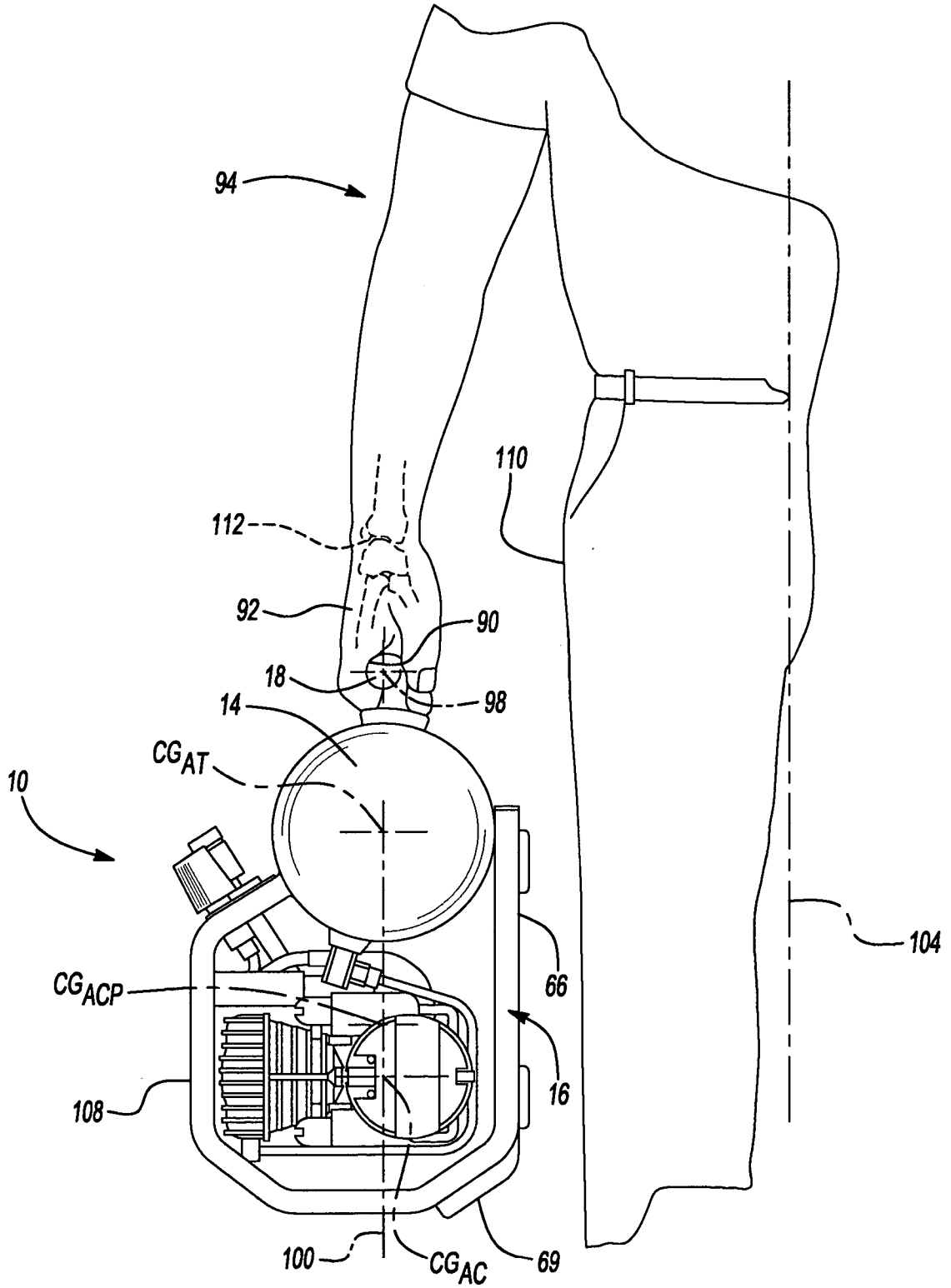


Fig-7B

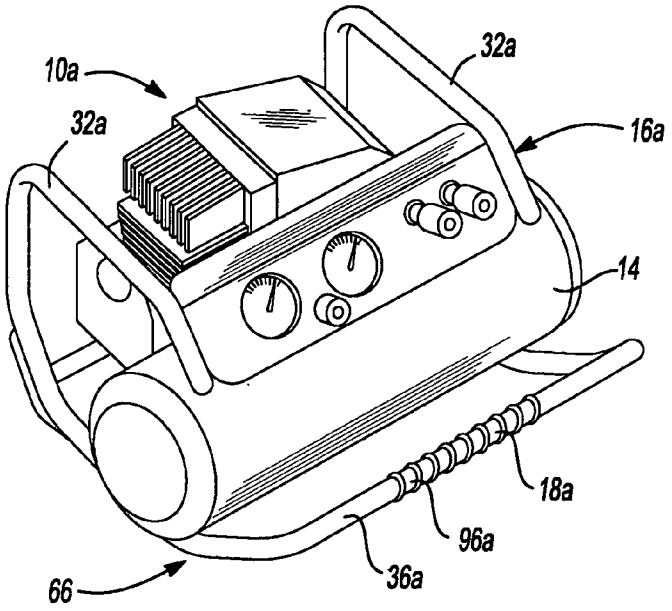


Fig-8

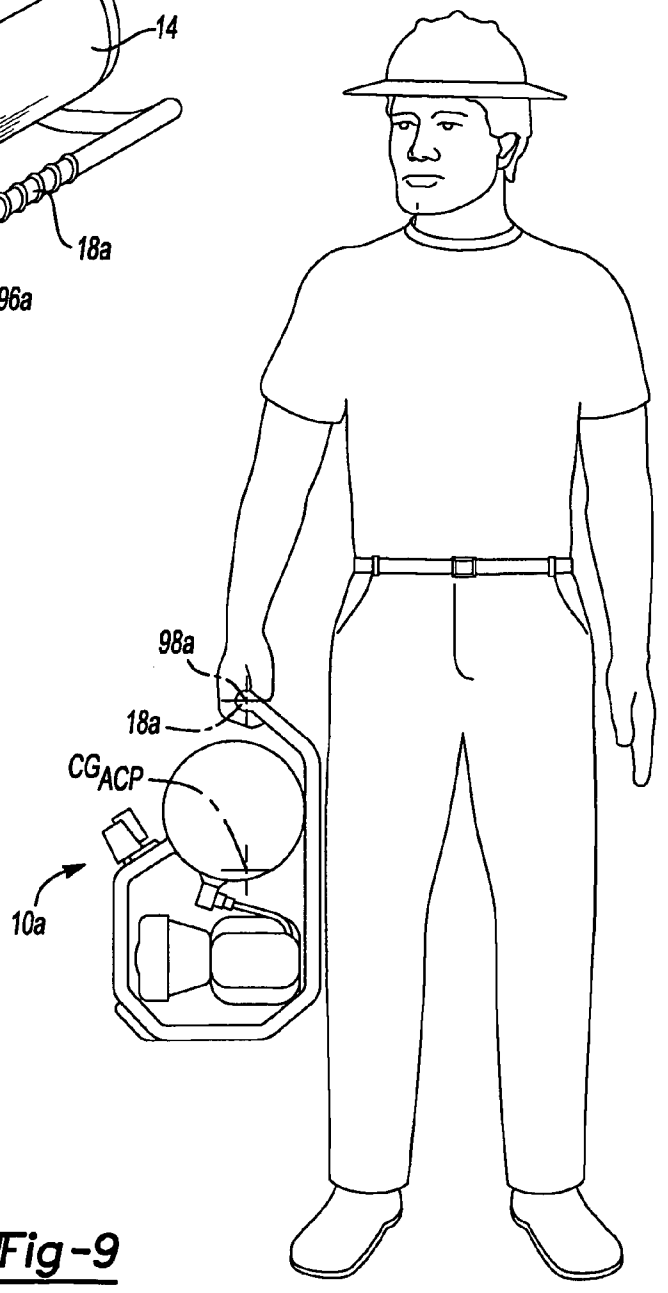


Fig-9

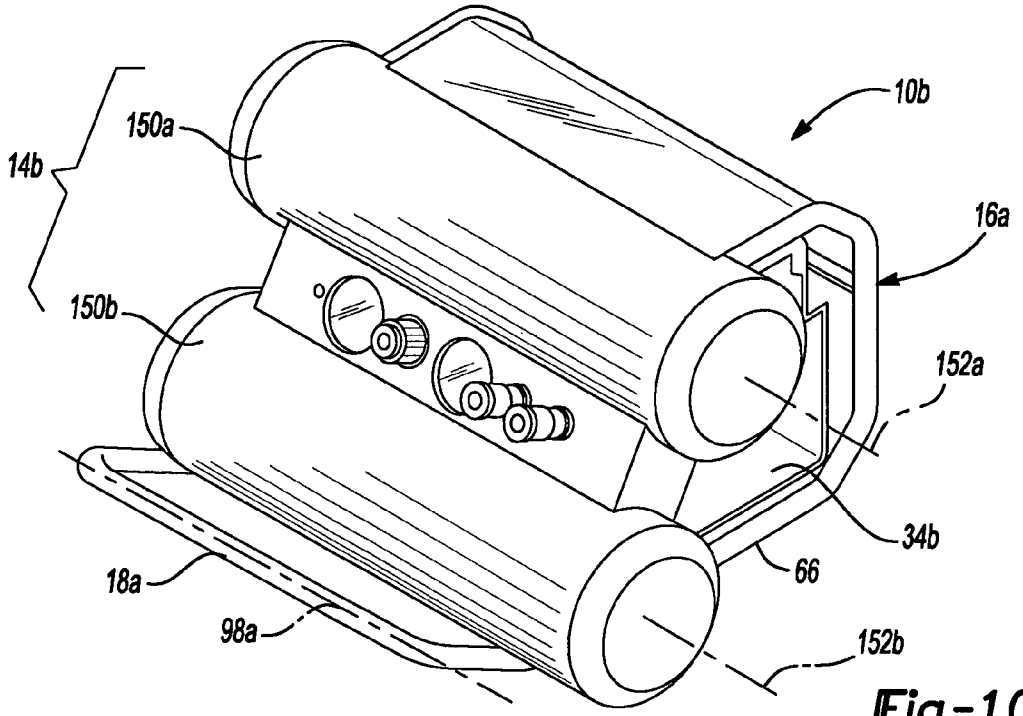

10b
150a
14b
16a
150b
152a
34b
66
18a
98a
152b

Fig-10

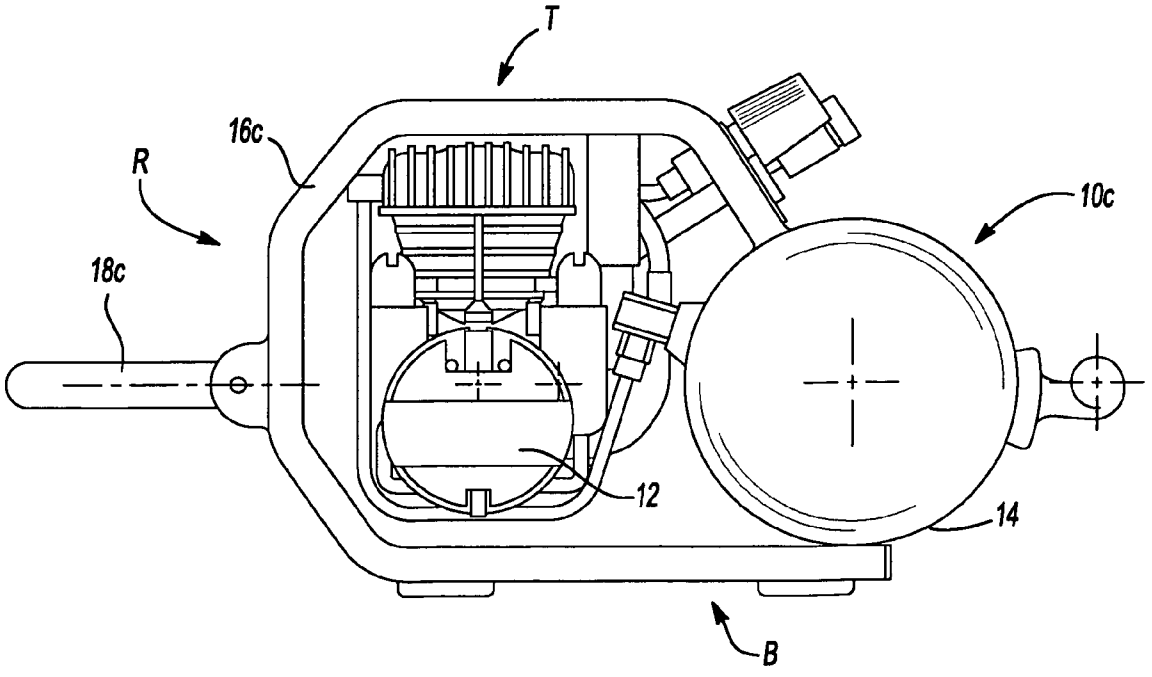

T
16c
R
10c
18c
12
14
B

Fig-11

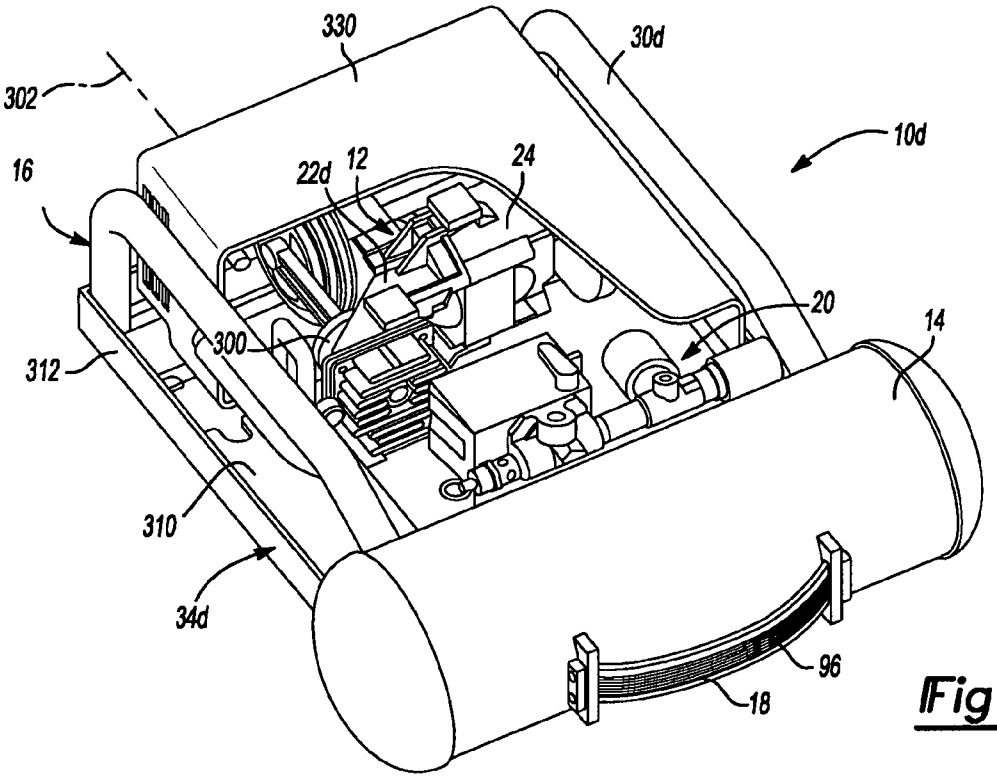

330
30d
302
10d
16
22d
12
24
20
14
300
312
310
34d
96
18

Fig-12

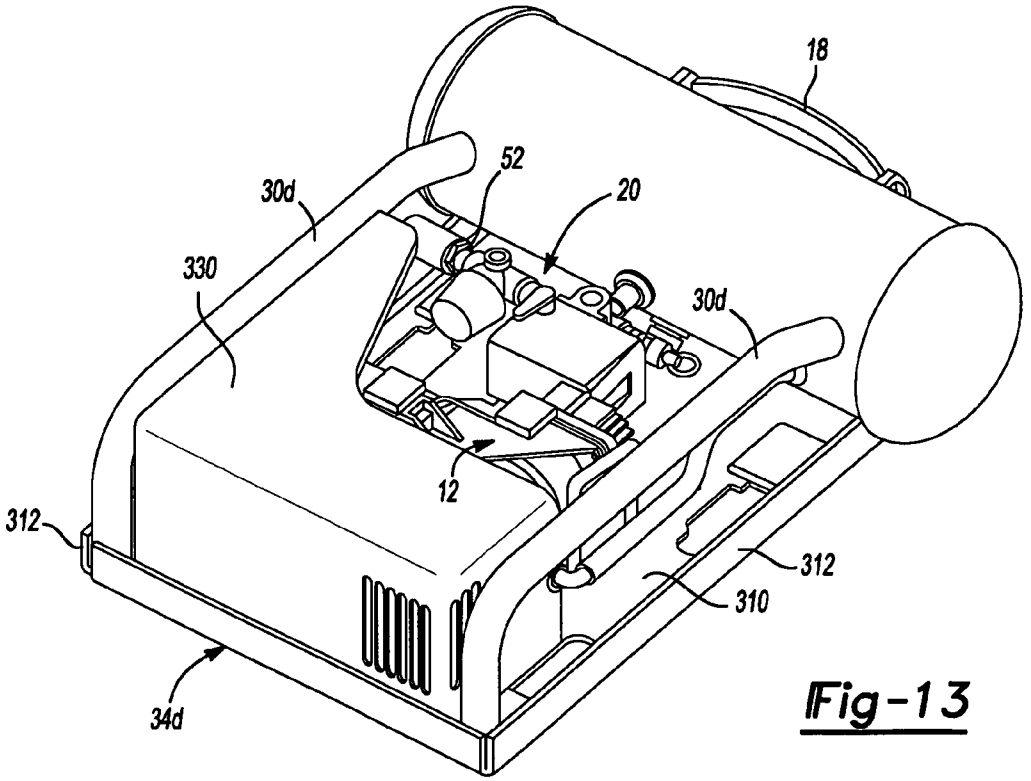

18
52
30d
20
330
30d
12
312
312
310
34d

Fig-13

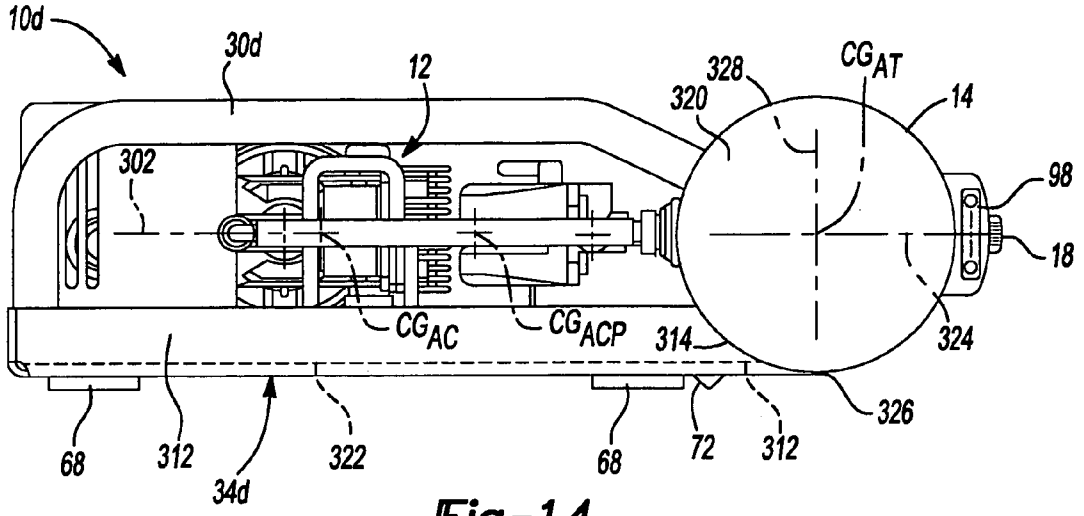

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CG_{AT}
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Fig-14

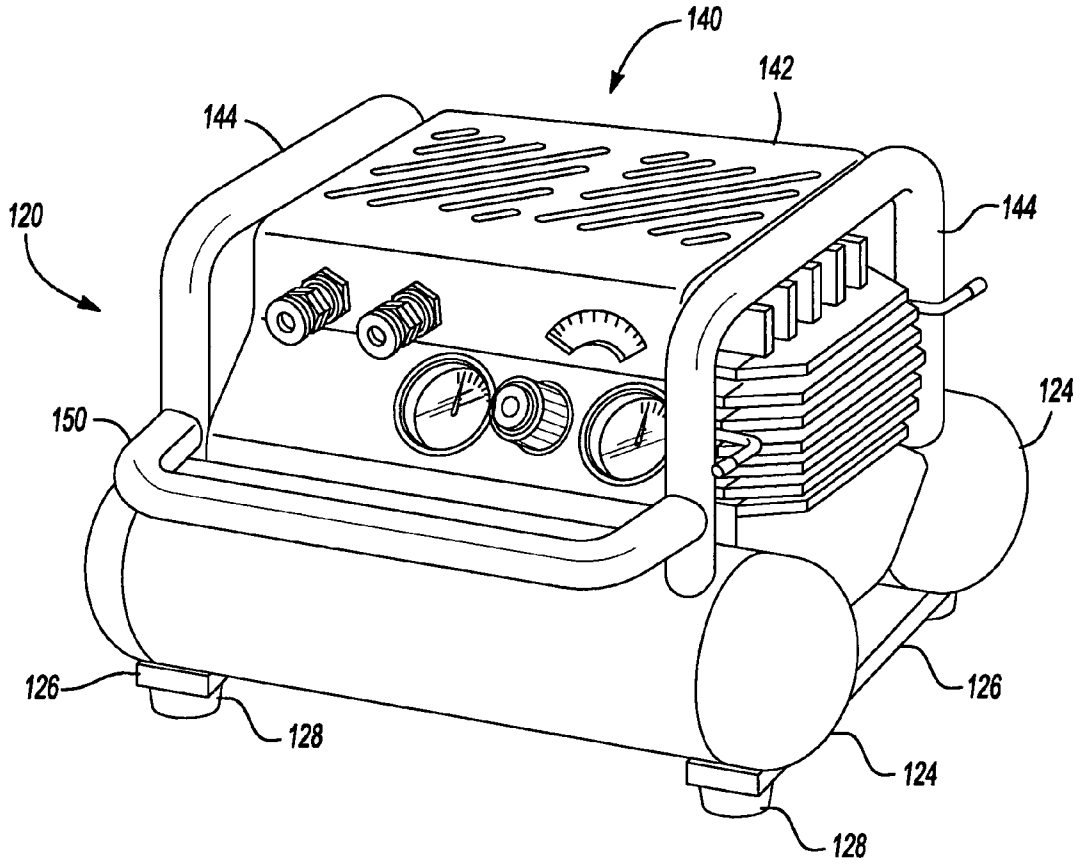

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Fig-15

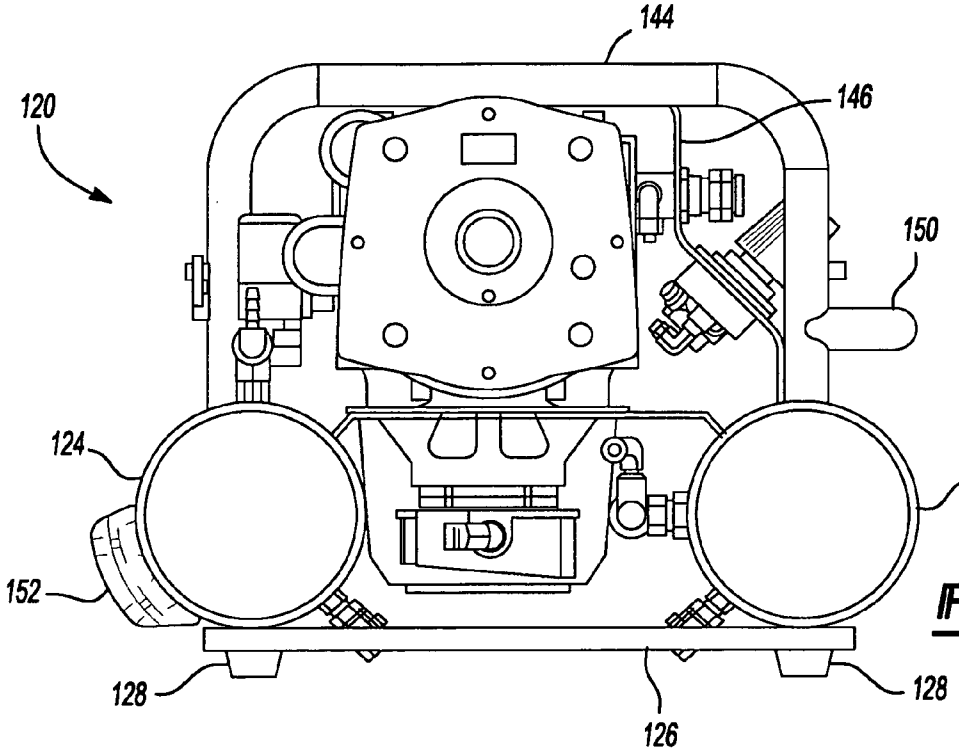

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Fig-16

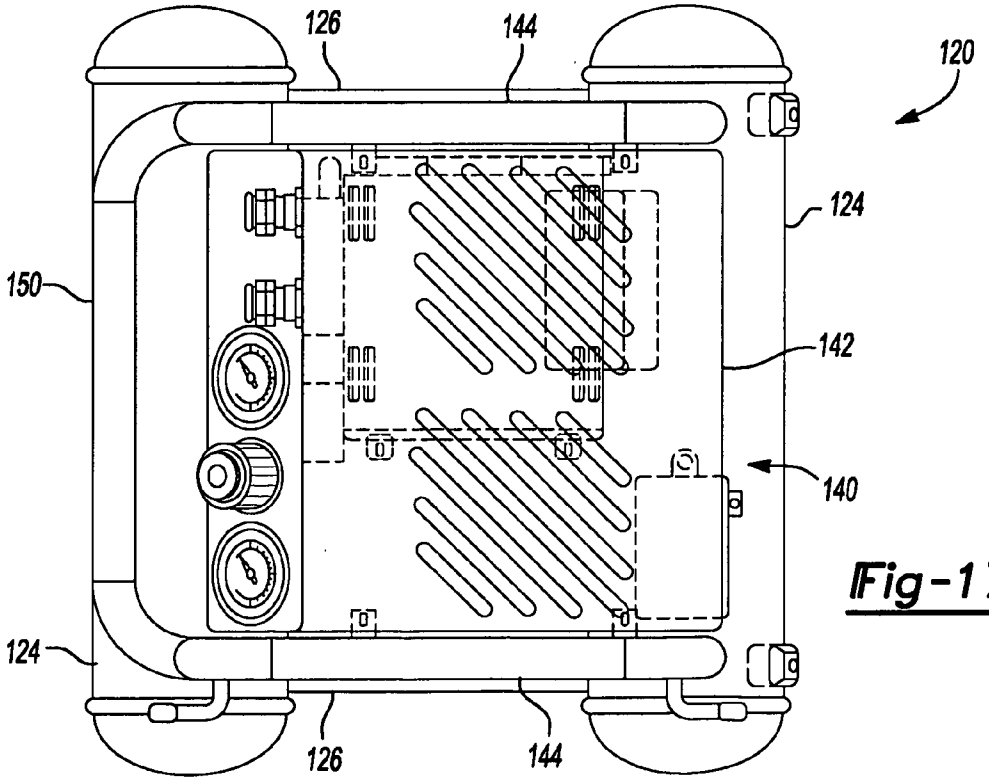

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Fig-17

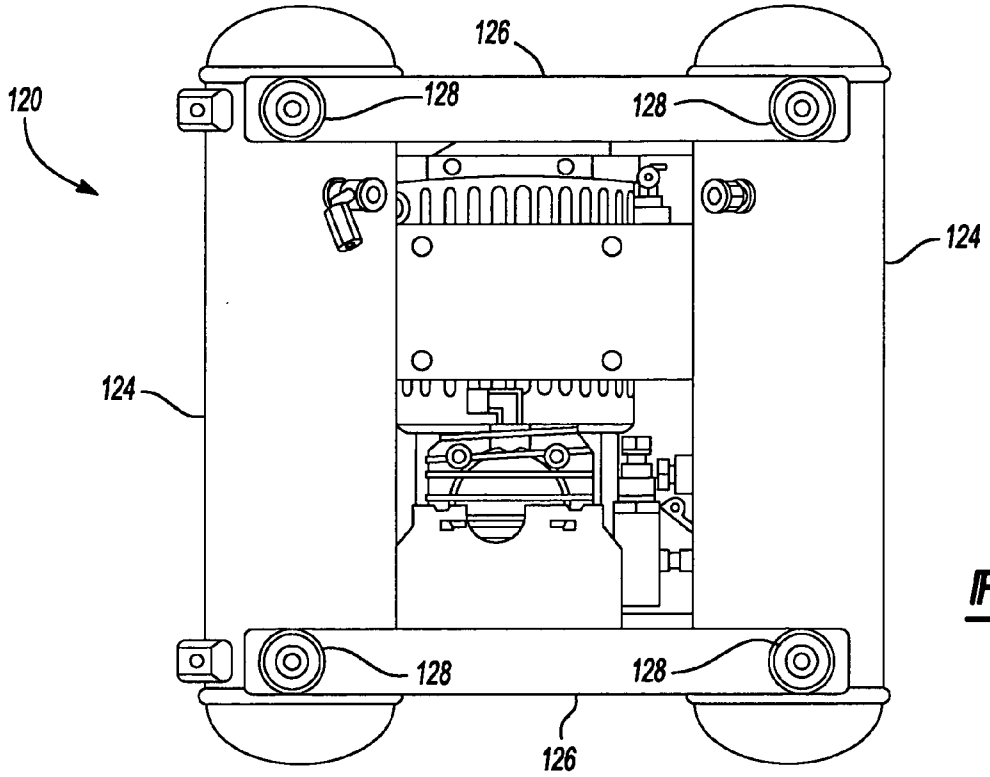

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Fig-18

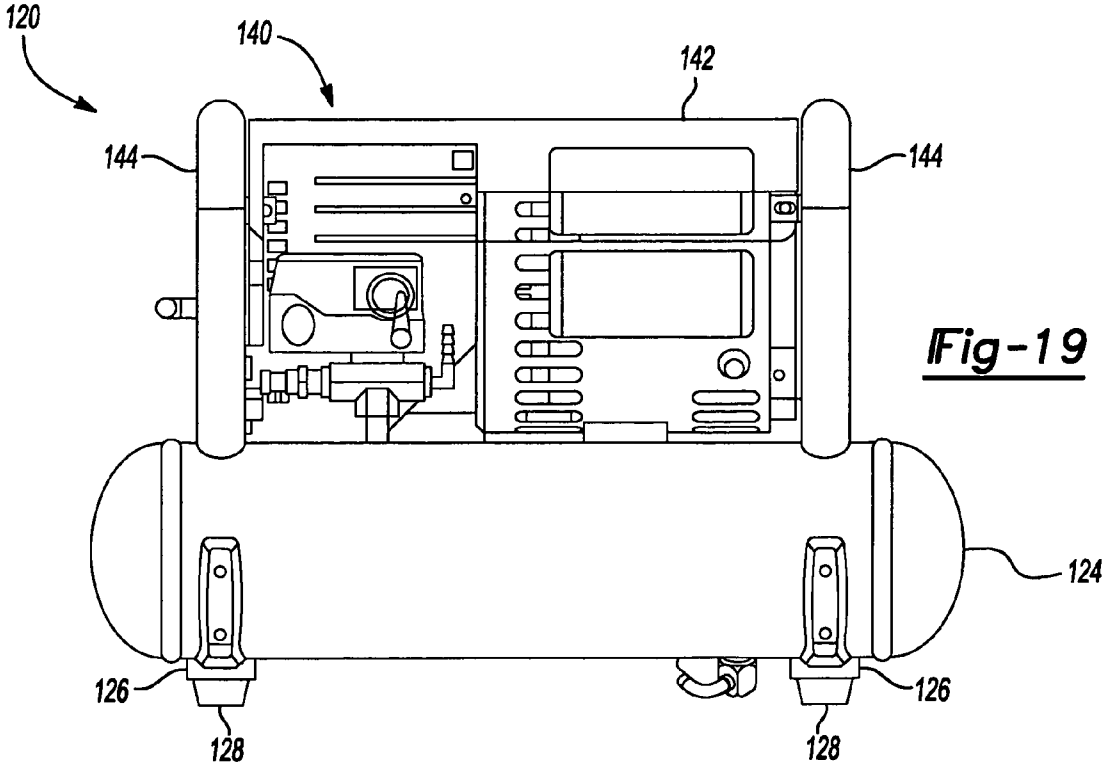

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Fig-19

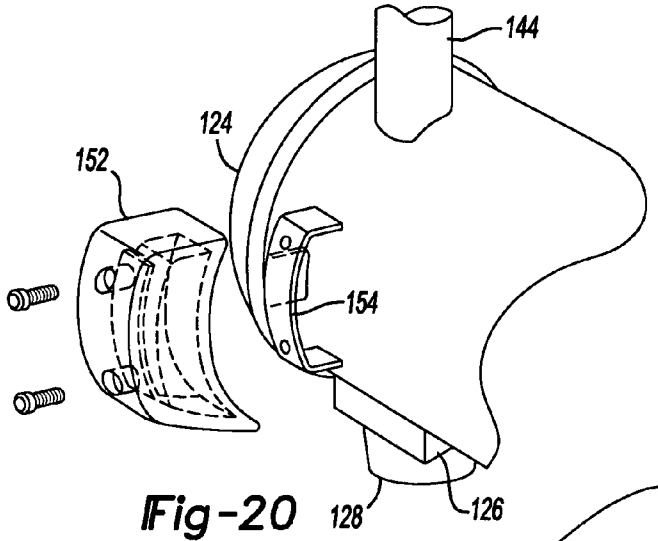


Fig-20

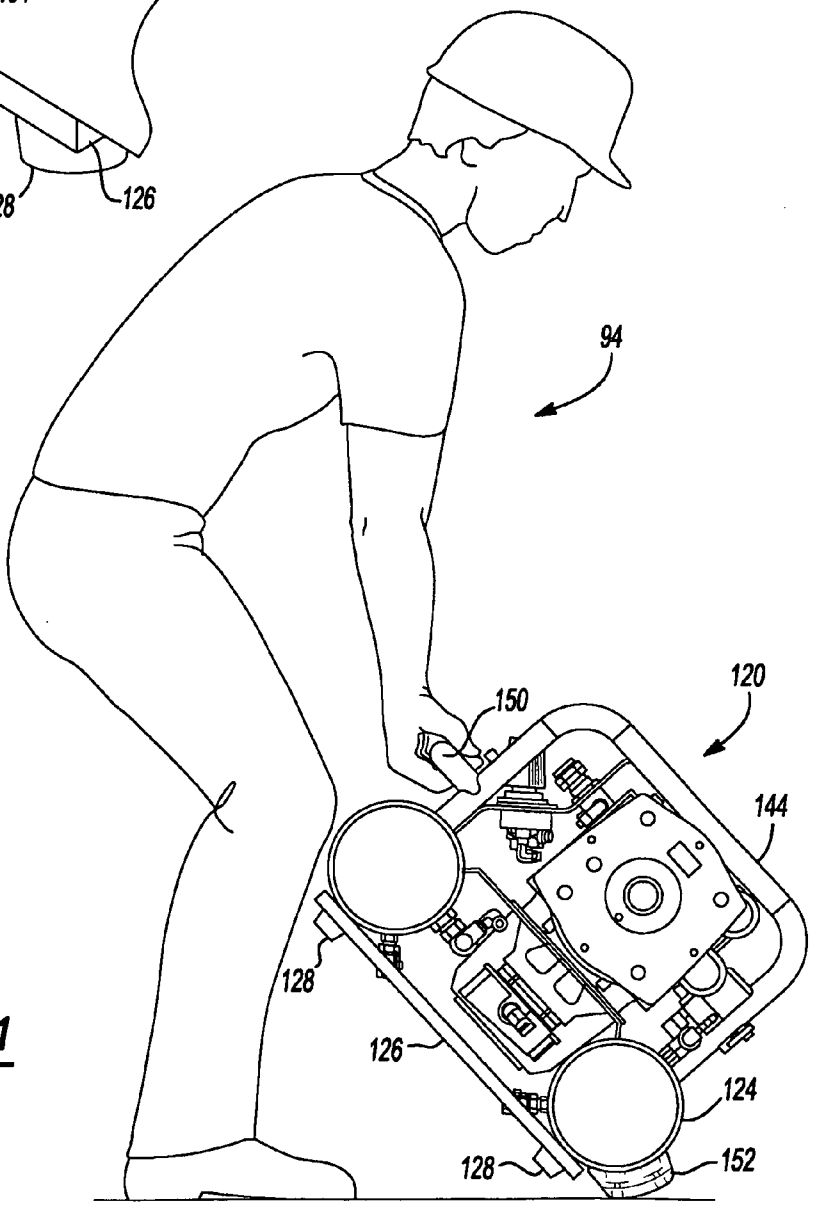


Fig-21

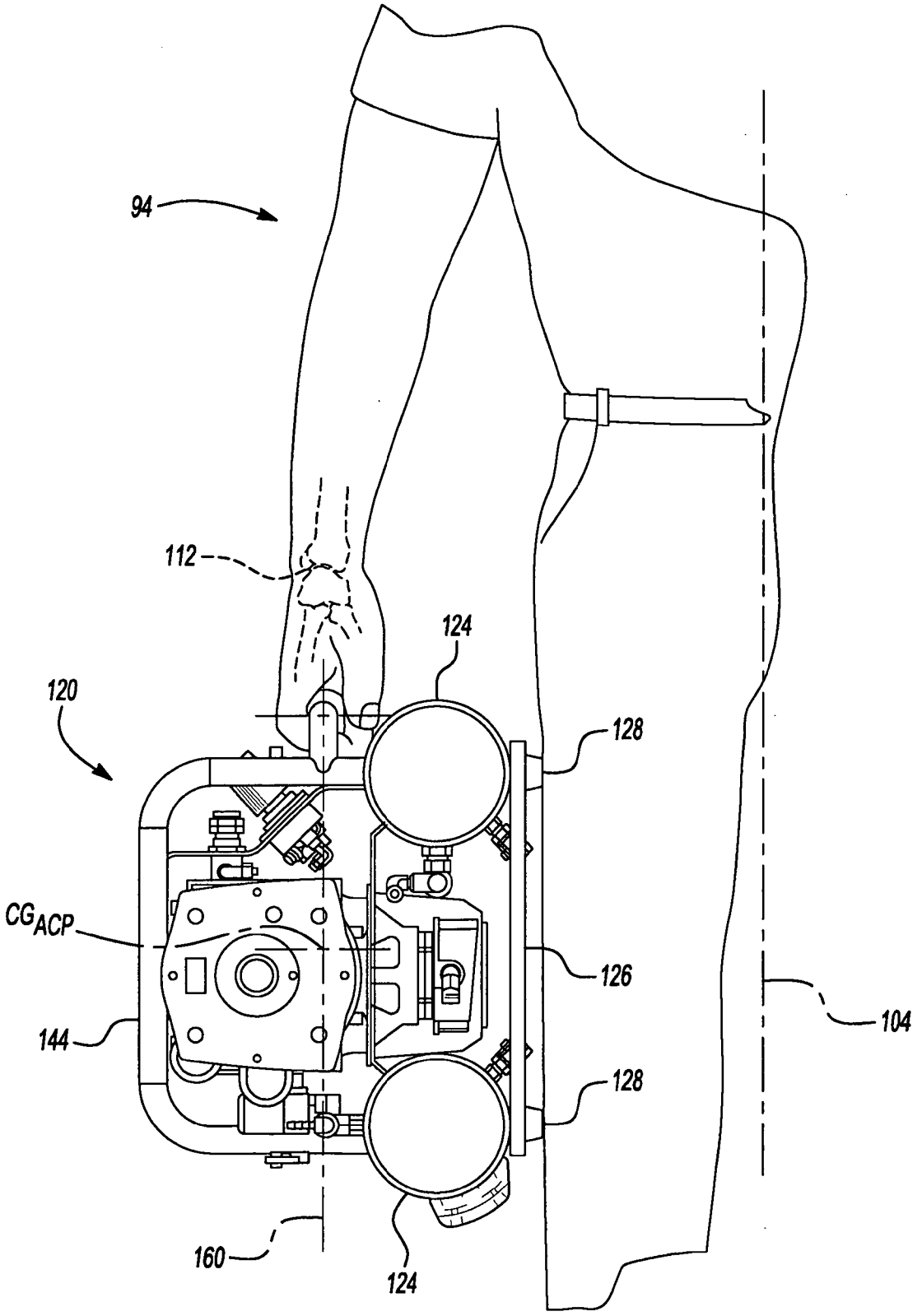


Fig-22

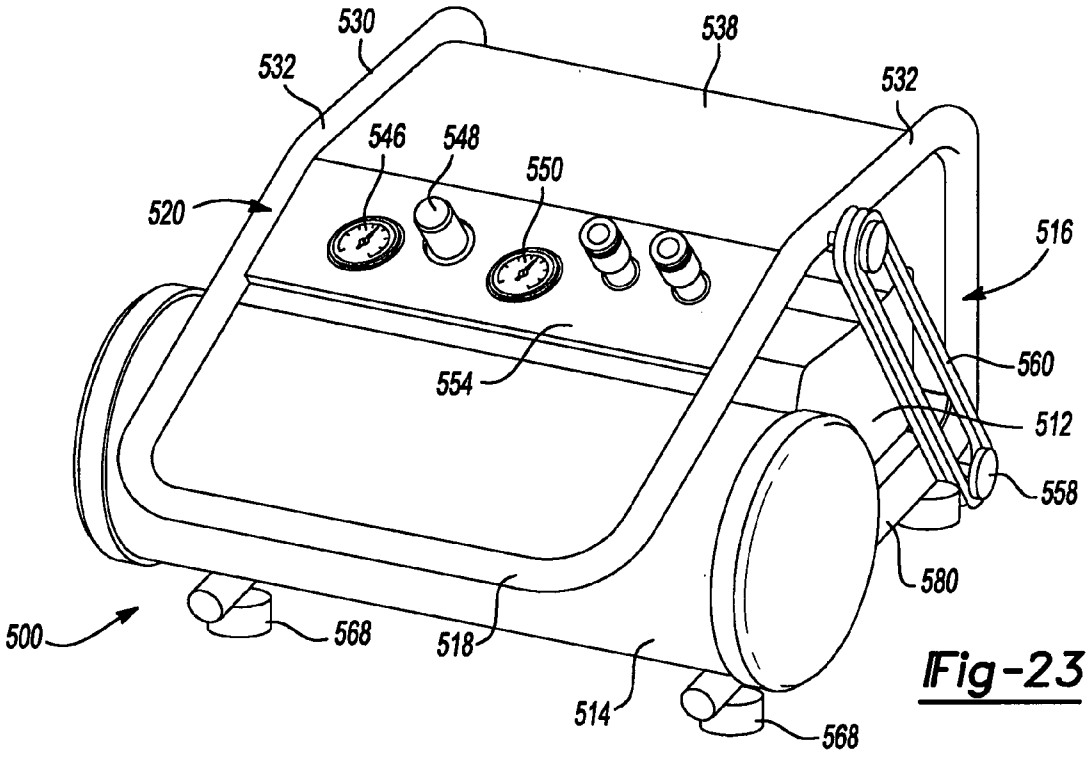

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516
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580
500
568
518
514
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Fig-23

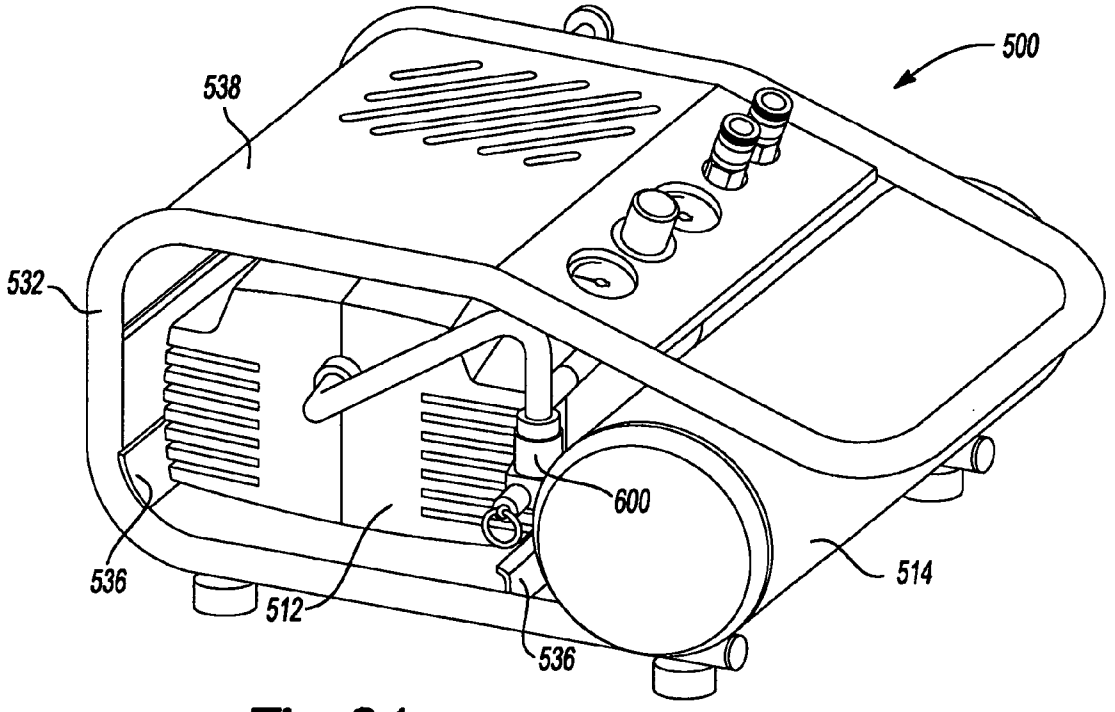

500
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532
600
536
512
514
536

Fig-24

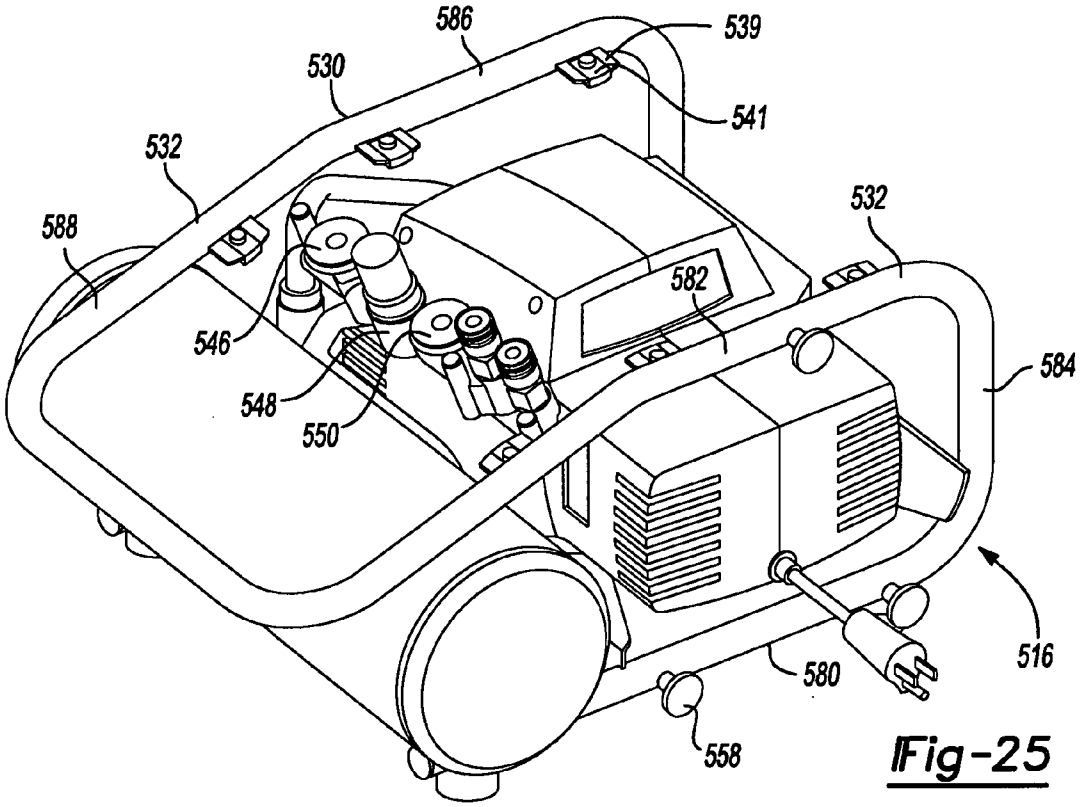

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541
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516
580
558

Fig-25

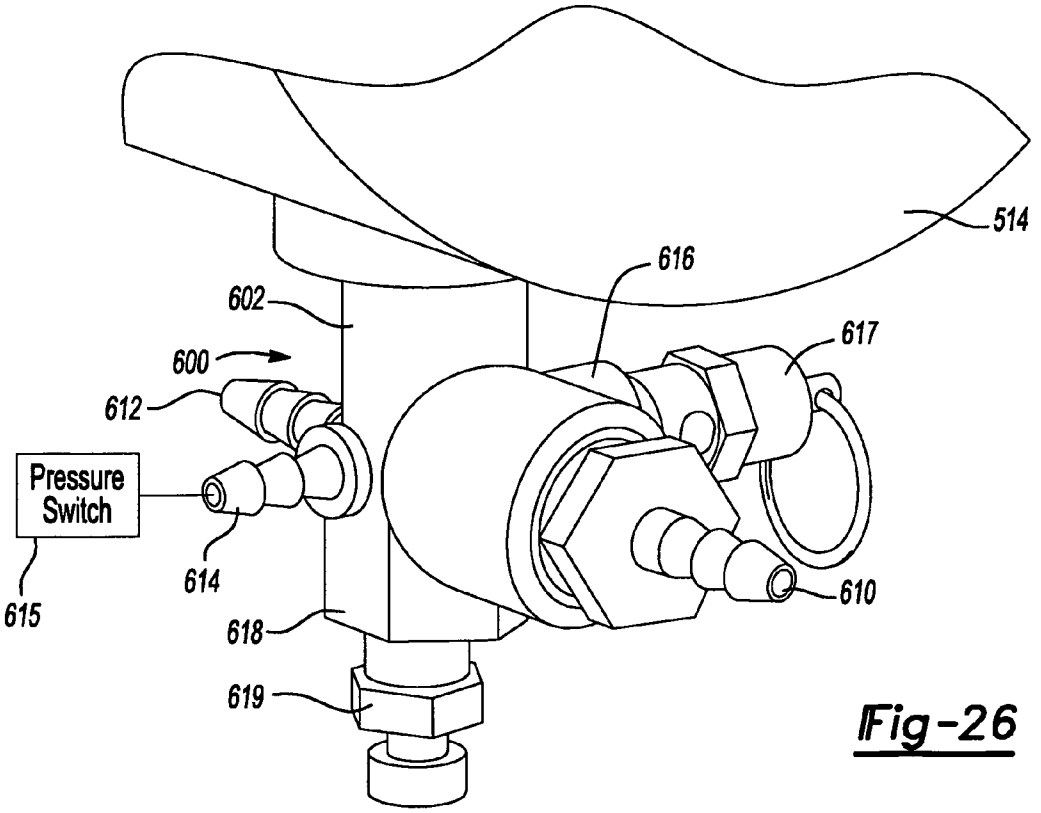

514
616
602
617
600
612
Pressure Switch
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615
610
618
619

Fig-26

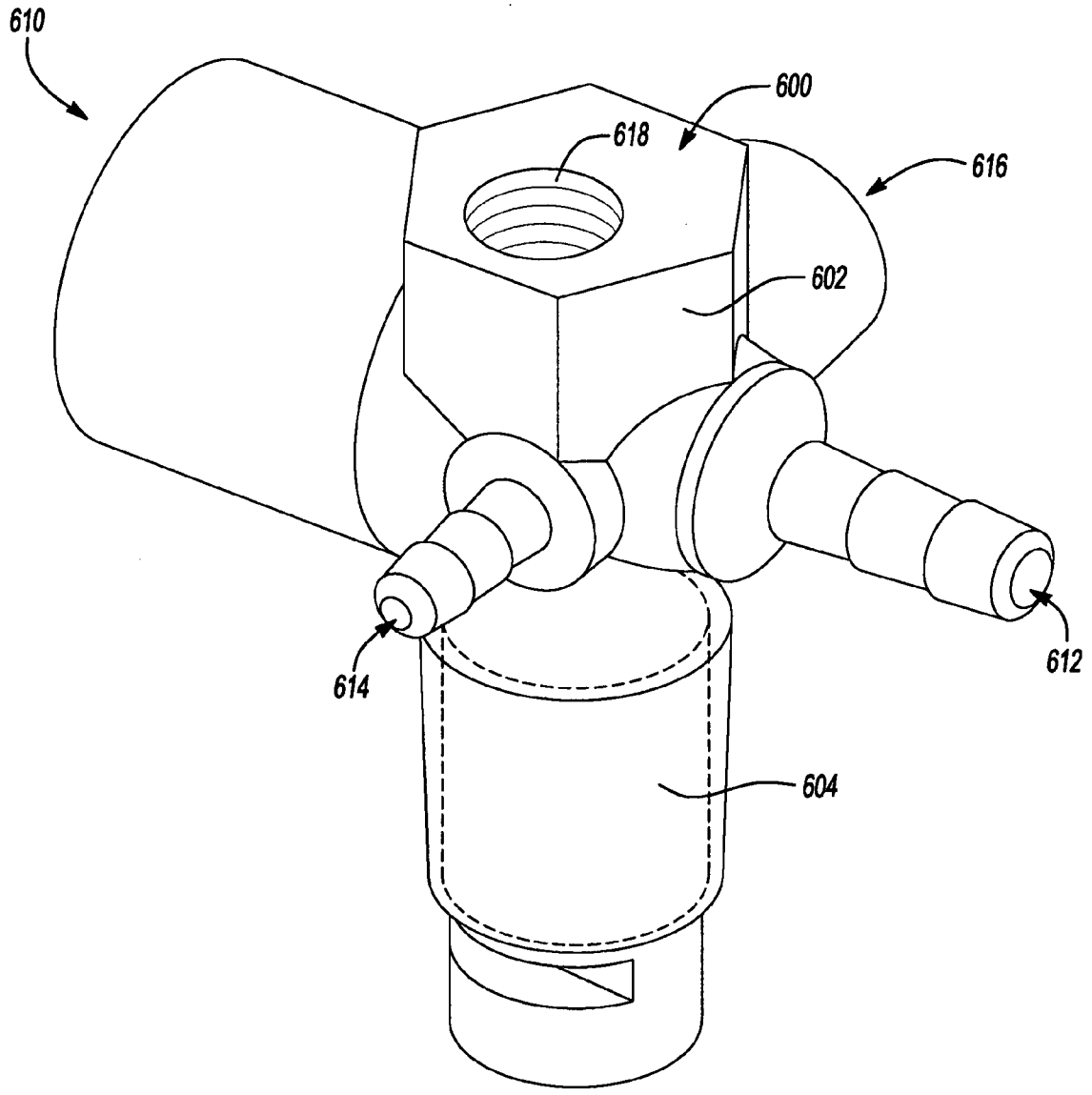


Fig-27

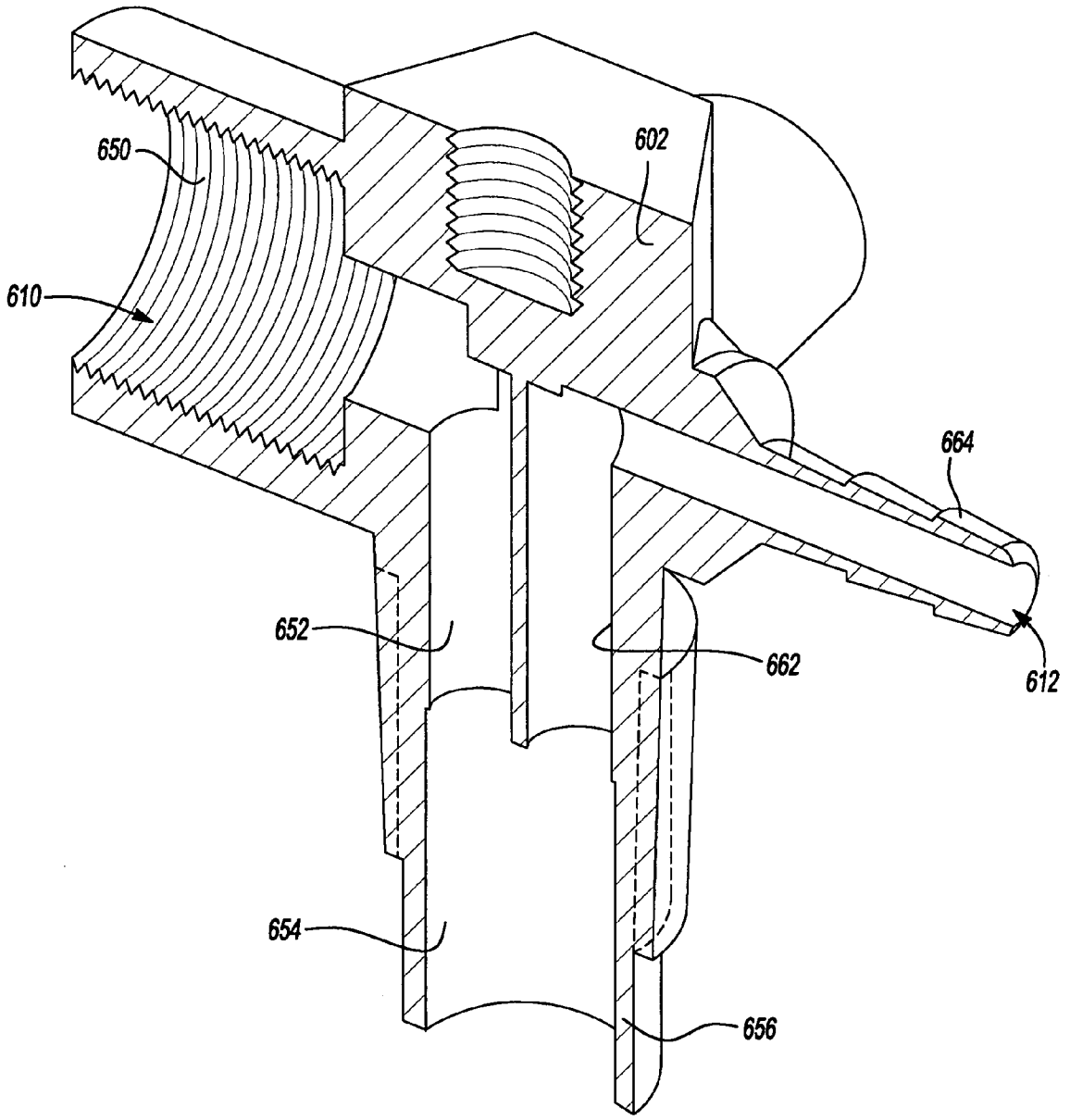


Fig-28

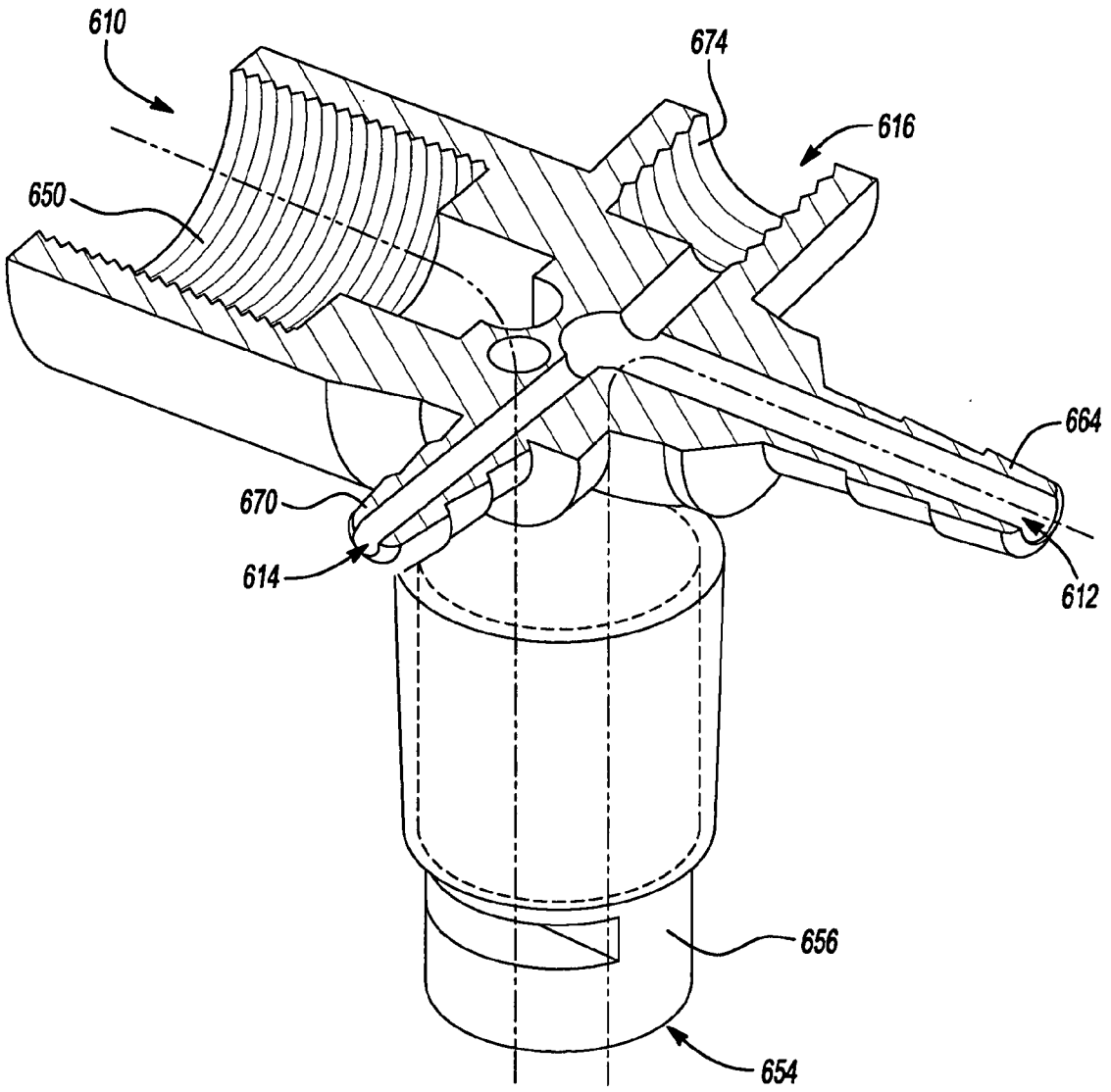


Fig-29

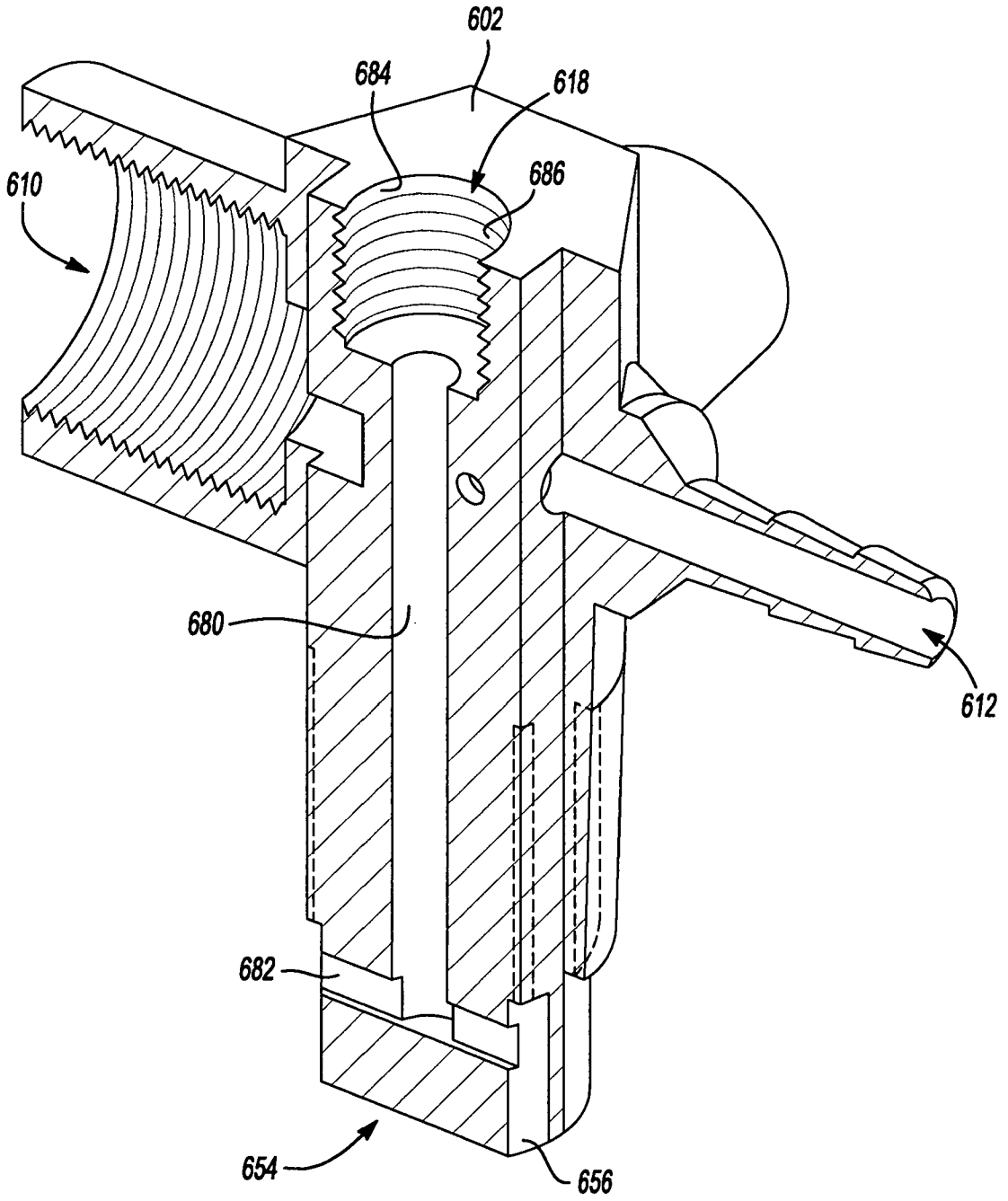


Fig-30

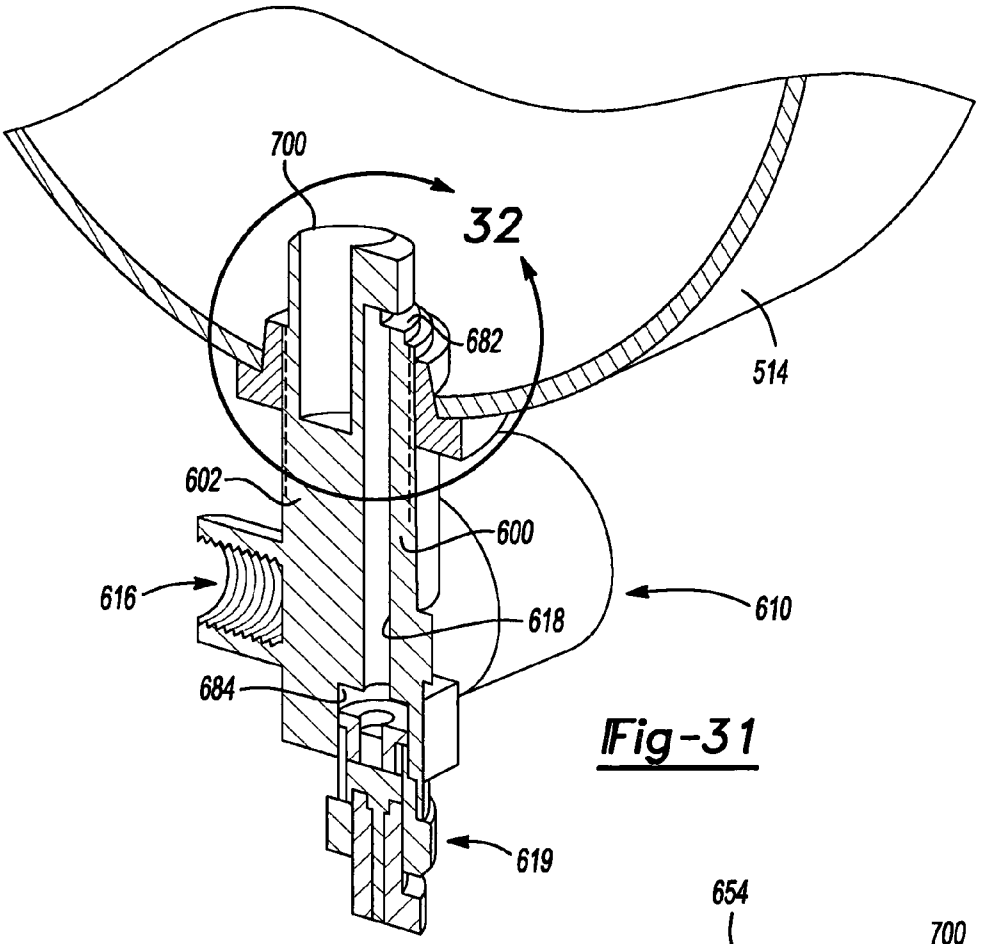


Fig-31

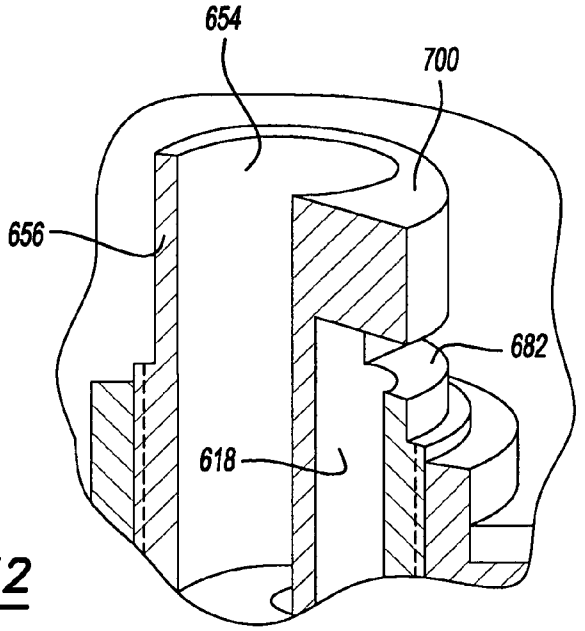


Fig-32

AIR COMPRESSOR

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. patent application Ser. No. 10/805,987, filed Mar. 22, 2004, and Ser. No. 11/053,033, filed Feb. 8, 2005, which are continuation-in-part applications of U.S. patent application Ser. No. 10/630,090 filed Jul. 30, 2003, which is a continuation of U.S. patent application Ser. No. 10/154,416 filed May 23, 2002. U.S. patent application Ser. No. 10/154,416 claimed the benefit of U.S. Provisional Application No. 60/366,676, filed Mar. 22, 2002 and is a continuation-in-part of U.S. application Ser. No. 29/136,877 filed Feb. 8, 2001. U.S. application Ser. No. 29/136,877 issued as U.S. Design Pat. No. D461,196 on Aug. 6, 2002. Each of the aforementioned applications is incorporated by reference.

FIELD OF THE INVENTION

[0002] The present invention generally relates generally to the field of portable air compressors and more particularly to hand portable air compressors.

BACKGROUND OF THE INVENTION

[0003] Small air compressors have become common tools around the home, workshop and work site. For home, recreation and other light duty uses such as inflating sports or recreation equipment or for emergency use in inflating a car tire a number of very small and lightweight compressors are available. Such tasks require relatively low-pressure compressed air and/or relatively low airflow rates. Weight is kept low and portability is maximized in these designs by use of small, low volume and/or low-pressure compressors powered by small lightweight electric motors. Additionally, significant weight, size and cost savings are achieved by the omission of a high-pressure vessel (i.e., air tank), as well as an oil lubrication system.

[0004] Many jobs, however, require higher air pressures, and/or greater instantaneous air flow demands which typically exceed the capacity of the hobby or recreational use compressors. To satisfy the demands of higher air pressure and higher airflow tasks it is necessary to increase the size of the compressor and the related motor or engine. Furthermore, rather than sizing the compressor to meet the maximum theoretical instantaneous air flow demand, it is common design practice to include a compressed air reservoir in the form of an air tank or other pressure vessel. The tank, usually with an output regulator, can hold a quantity of pressurized air to meet peak demands from serviced loads, while allowing the use of a smaller and lighter compressor that charges the tank and is capable of meeting the average compressed air flow rate for the intended use.

[0005] The air tank and the larger compressor that are typically required to meet the desired pressure and airflow levels substantially increase the weight and overall size of the compressor package. Units designed for high pressure and high volume tasks can rapidly reach a weight and size where the well-known motor vehicle mounted or towed trailer configuration is the only practical form. Still, there are a range of intermediate capacity air compressors that are common tools around the construction site and which are man portable.

[0006] Current models of man portable air compressor packages comprise a stand or supporting structure on or in which are mounted a motor or engine, an air compressor, an air tank, a discharge manifold and various valves, instrumentation and controls. Many of the larger portable configurations are provided with wheels, in what is often referred to as a wheelbarrow configuration, so that they can be moved by a single user. Examples of wheeled air compressors include Models D55170 and D55270, which are marketed by The Black & Decker Corporation under the DeWalt® trade name.

[0007] Still, some users of intermediate capacity professional grade compressors find it necessary or desirable to have a compressor that is capable of being lifted and carried by hand. One common approach taken by air compressor manufacturers to improve the portability of such intermediate capacity professional grade compressors has been to redesign the air compressor so as to reduce its weight. Despite such efforts, intermediate capacity professional grade compressors frequently weigh more than 50 pounds and thus remain difficult to lift and move by hand, even for those users who are physically strong.

[0008] Aside from the issue of their weight, hand-portable intermediate capacity professional grade compressors are also known to be quite cumbersome to transport. In this regard, the configurations that use two cylindrical tanks or a single pancake tank (i.e., a cylindrical tank of large diameter but small height with convex ends) have become common, as have the mounting schemes for mounting the compressor and the motor. For example, configurations that use two cylindrical tanks typically mount the compressor and motor alongside the tanks, whereas configurations that use a single pancake tank typically mount the compressor and motor on an end of the tank.

[0009] These conventional air compressor arrangements provide a package with a relatively large base or footprint, and a center of gravity that is positioned in an approximately centered position within the footprint. While such arrangements provide the air compressor with a configuration that is relatively stable during its operation, lifting and carrying air compressors with these configurations tends to be rather awkward and difficult. In this regard, these configurations typically employ a handle (for lifting and carrying the air compressor) that is attached to an appropriate structure, such as the stand or the air tank, at a location that is located vertically above the center of gravity of the entire air compressor package. The handle is generally oriented in a manner that requires the air compressor package to be lifted vertically upwards and carried in an orientation that is substantially the same as the orientation in which it is operated.

[0010] Lifting and carrying the known intermediate air compressor packages in this manner, however, is relatively difficult, since the footprint of these air compressor packages tends to be relatively large and thus requires the user to hold the air compressor package with a somewhat outstretched arm such that the wrist of the user is in a state of flexion. In an effort to bring the air compressor package's center of gravity closer to the central axis of the user, the user will typically tilt their upper body away from the load of the air compressor package and thus will lift and transport the air compressor package with a body posture that is uncomfortable and awkward.

SUMMARY OF THE INVENTION

[0011] In one form, the present teachings provide an air compressor that includes a support structure, a compressor and an air tank in fluid connection with the compressor. The air tank has a capacity of at least 0.5 gallons. The support structure includes a tubular frame that defines a pair side members and a handle that is disposed between and connects the side members. Each side member includes a first leg, an arm and a second leg. The first leg is disposed under a first side of the compressor and secured to the air tank at a first location. The second leg has a first portion, which is generally parallel to the first leg, and a second portion that extends downwardly toward the first leg and outwardly toward the handle. The air tank has a generally cylindrical shape and extends longitudinally between the side members. The air tank abuts the first legs and the second portion of the second legs. The handle is configured to be grasped by a hand of a user so that the air compressor can be rotated about an axis that is generally parallel to a longitudinal axis of the air tank between an operating position and a hand-carried transport position.

[0012] In another form, the present teachings provide a method that includes: providing an air compressor apparatus having a support structure, a compressor, an air tank and a handle, the air tank being in fluid connection with the compressor and having a capacity that is greater than about 0.5 gallons, the handle being coupled to at least one of the support structure and the air tank; the support structure defining a base; placing the air compressor apparatus in an operating position wherein the base is disposed in a first orientation; and moving the air compressor apparatus to a hand-carried transport position by rotating the air compressor apparatus by the handle about an axis that is generally parallel to the handle, the base being disposed in a second orientation that is generally perpendicular to the first orientation when the air compressor apparatus is in the hand-carried transport position.

[0013] In still another form, the present teachings provide an air compressor with a compressor, an air tank having a tank wall that defines a tank cavity, a regulator valve and a manifold. The manifold has a manifold body that includes an inlet port and an outlet port. The manifold body is threadably coupled to the air tank. The inlet port is coupled in fluid connection to tank cavity and the compressor, while the outlet port is separate from the inlet port and in fluid connection with the tank cavity and the pressure regulator.

[0014] Further areas of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be understood that the detailed description and specific examples, while indicating the preferred embodiment of the invention, are intended for purposes of illustration only and are not intended to limit the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Additional advantages and features of the present invention will become apparent from the subsequent description and the appended claims, taken in conjunction with the accompanying drawings, wherein:

[0016] **FIG. 1** is a perspective view of a compressor package constructed in accordance with the teachings of the prior art;

[0017] **FIG. 2** is a front view of a user transporting the compressor package of **FIG. 1**;

[0018] **FIG. 3** is a perspective view of an air compressor package constructed in accordance with the teachings of the present invention;

[0019] **FIG. 4** is a left side elevational view of the air compressor package of **FIG. 3** as positioned in an operational position;

[0020] **FIG. 5** is a rear elevational view of the air compressor package of **FIG. 3**;

[0021] **FIG. 6** is a bottom plan view of the air compressor package of **FIG. 3**;

[0022] **FIG. 7A** is a left side elevational view of the air compressor package of **FIG. 3** as it is being rotated into a transport position;

[0023] **FIG. 7B** is a left side elevational view of the air compressor package of **FIG. 3** as positioned in the transport position;

[0024] **FIG. 8** is a perspective view of an air compressor package constructed in accordance with the teachings of an alternate embodiment of the present invention;

[0025] **FIG. 9** is a left side elevational view of the air compressor package of **FIG. 8** as positioned in a transport position;

[0026] **FIG. 10** is a perspective view of an air compressor package constructed in accordance with the teachings of another alternate embodiment of the present invention;

[0027] **FIG. 11** is a left side elevational view of an air compressor package constructed in accordance with the teachings of still another alternate embodiment of the present invention;

[0028] **FIG. 12** is a front perspective view of another air compressor package constructed in accordance with the teachings of the present invention;

[0029] **FIG. 13** is a rear perspective view of the air compressor package of **FIG. 12**;

[0030] **FIG. 14** is a left side elevation view of the air compressor package of **FIG. 12**;

[0031] **FIG. 15** is a perspective view of an air compressor package constructed in accordance with the teachings of another alternate embodiment of the present invention;

[0032] **FIG. 16** is a left side elevational view of the air compressor package of **FIG. 15** as positioned in an operational position;

[0033] **FIG. 17** is a top plan view of the air compressor package of **FIG. 15**;

[0034] **FIG. 18** is a bottom plan view of the air compressor package of **FIG. 15**;

[0035] **FIG. 19** is rear elevational view of the air compressor package of **FIG. 15**;

[0036] **FIG. 20** is an exploded perspective view of a portion of the air compressor package of **FIG. 15**;

[0037] **FIG. 21 a** left side elevational view of the air compressor package of **FIG. 15** as it is being rotated into a transport position;

[0038] **FIG. 22** is a left side elevational view of the air compressor package of **FIG. 15** as positioned in the transport position;

[0039] **FIG. 23** is a perspective view of another air compressor package constructed in accordance with the teachings of the present disclosure;

[0040] **FIG. 24** is a side perspective view of the air compressor package of **FIG. 22**;

[0041] **FIG. 25** is a perspective view of a portion of the air compressor package of **FIG. 23** with the cowling removed;

[0042] **FIG. 26** is an enlarged perspective view of a portion of the air compressor package of **FIG. 23** illustrating the coupling of the manifold to the air tank in greater detail;

[0043] **FIG. 27** is a perspective view of the manifold;

[0044] **FIG. 28** is a longitudinal section view of the manifold taken through the inlet and outlet ports;

[0045] **FIG. 29** is a section view perpendicular to the longitudinal axis of the manifold through the outlet port, the pressure port and the relief port;

[0046] **FIG. 30** is a longitudinal section view of the manifold taken through the drain port;

[0047] **FIG. 31** is a section view similar to **FIG. 30** but taken through the air tank and the manifold; and

[0048] **FIG. 32** is an enlarged view of a portion of **FIG. 32**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0049] With reference to **FIGS. 1 and 2** of the drawings, a prior art air compressor package **1** is illustrated to include a support structure **2**, a compressor mechanism **3**, an air tank **4** and a handle **5**. The compressor mechanism **3** and the air tank **4**, which are among the heavier components of the air compressor package **1**, are distributed horizontally about the support structure **2** such that the center of gravity **6** of the air compressor package **1** is disposed well within the interior of an area bounded by the support structure **2**. The handle **5** is coupled to the support structure **2** in a manner that places a centerline **7** of the handle **5** vertically in-line with the center of gravity **6** of the air compressor package **1**.

[0050] With additional reference to **FIG. 2**, the configuration of the handle **5** is such that it permits the air compressor package **1** to be lifted vertically and transported in the same orientation as it is operated. The size of the footprint or base **8** of the air compressor package **1**, however, is relatively large, which necessitates that the user **9** transport the air compressor package **1** with a somewhat outstretched arm **9***a*. Consequently, the user's wrist **9***b* is maintained in a state of flexion, which tends to be uncomfortable for the user and fatiguing.

[0051] In **FIGS. 3 through 5**, an air compressor package constructed in accordance with the teachings of the present invention is generally indicated by reference numeral **10**. The air compressor package **10** is illustrated to include a compressor mechanism **12**, an air tank **14**, a support structure **16**, a handle **18** and a gauge package **20**. The compressor mechanism **12** is conventional in its construction and operation and as such, need not be discussed in detail herein. Briefly, the compressor mechanism **12** includes a compressor **22**, which is operable for intaking and compressing ambient air, and a power source, such as an electric motor **24** or an engine, for providing power to the compressor **22**. The compressed air that exits the compressor **22** is discharged to the air tank **14**, which serves as a reservoir for the compressed air.

[0052] The air tank **14** has a capacity of at least 0.5 gallons and in the particular example provided, is illustrated as having a single cylindrically shaped tank structure. The air tank **14**, however, preferably has a capacity of about 1 to about 8 gallons, and more preferably a capacity of about 3 to about 5 gallons. Those skilled in the art will understand that the air tank **14** may be configured somewhat differently, as with a conventional pancake-style (i.e., a relatively short and large diameter cylinder with convex ends) tank structure (not shown) or with a plurality of tank structures that are coupled in fluid connection.

[0053] The support structure **16** is illustrated to be configured in a "roll-cage" manner that extends around both the compressor mechanism **12** and the gauge package **20** to protect these components should the air compressor package **10** be overturned or impacted by another object. In the particular embodiment illustrated, the support structure **16** includes a tubular frame **30** having opposite laterally extending sides **32** that are interconnected by a mounting platform **34** and a plurality of strut members **36**, as well as an optional shield or cover **38**. In the example provided, the cover **38** is formed from a sheet material, such as steel, aluminum or plastic, and is removably fastened with, for example, conventional threaded fasteners (not shown) to the tubular frame **30**. While the primary purpose of the cover **38** is to protect components such as the compressor mechanism **12** and the gauge package **20** from damaging contact with, for example, falling tools and workpieces, those skilled in the art will understand that the relatively smooth outer surface of the cover **38**, when abutted against the lateral side of the user during transport, is relatively more comfortable and less likely to interfere with the movement of the user as compared to the tubular frame **30**, the compressor mechanism, the air tank **14** and/or the gauge package **20**.

[0054] In the example provided, the laterally extending sides **32** are constructed in an open manner, such that the ends **42** of the laterally extending sides **32** do not intersect one another but rather intersect the air tank **14**. The ends **42** are coupled to the air tank **14** through a conventional coupling means, such as welds. In the particular embodiment illustrated, the air tank **14** extends through the laterally extending sides **32** but those skilled in the art will understand that the air tank **14** could alternatively be configured to terminate flush or inboard of the laterally extending sides **32** so that the support structure **16** would also protect the opposite ends of the air tank **14**. The gauge package **20**, which conventionally includes an air tank pressure gauge **46**, a regulator **48**, a regulator gauge **50** and an outlet manifold **52**, is coupled to a gauge panel **54** that is mounted between the laterally extending sides **32** of the support structure **16**. The gauge panel **54** may be a discrete component or may be integrally formed with the cover **38**. Pref-

erably, the gauge panel **54** is mounted in a rearwardly sloped orientation, which is best illustrated in **FIGS. 3 and 4**, as opposed to the substantially vertical orientation that is illustrated in the prior art air compressor package **1** of **FIG. 1**, so as to position the air tank pressure gauge **46**, the regulator **48**, the regulator gauge **50** and the outlet manifold **52** in a manner that is relatively more comfortable for the user of the air compressor package **10** to read and/or access. As those skilled in the art will appreciate from this disclosure, the improved readability of the air tank pressure gauge **46** and the regulator gauge **50** and the improved accessibility of the regulator **48** that result from the positioning of the gauge panel **54** in a rearwardly sloped orientation improves the accuracy with which the user is able to control the air pressure that is delivered to the outlet manifold **52**. Pegs **58**, which are coupled to one of the laterally extending sides **32** and extend outwardly therefrom, are optionally provided so as to permit items, such as a power cord **60** or an air hose **62**, to be coiled (around the pegs **58**) for storage.

[**0055**] The mounting platform **34**, which is illustrated to be fabricated from a sheet material, such as steel, aluminum or plastic, serves as the base **66** of the support structure **16**. The compressor mechanism **12** is coupled to the mounting platform **34** via a plurality of threaded fasteners (not specifically shown). A plurality of rubber feet **68** are affixed to the corners of the mounting platform **34** and serve to dampen vibrations that are transmitted through the support structure **16** as well as to provide the support structure **16** with a degree of skid resistance. With specific reference to **FIG. 6**, an access aperture **70** is formed through the mounting platform **34** and permits the user to access a valve mechanism **72** to manually drain the air tank **14**.

[**0056**] With renewed reference to **FIG. 4**, those skilled in the art will appreciate that the air tank **14** and the compressor mechanism **12** are coupled to the support structure **16** such that their centers of gravity, CG_{AT} and CG_{AC}, respectively, are positioned relatively close to the base **66** when the air compressor package **10** is oriented in its operational position (**FIGS. 3 through 5**). As the air tank **14** and the compressor mechanism **12** account for a majority of the weight of the air compressor package **10**, configuration in this manner is advantageous in that it provides the air compressor package **10** with a relatively low center of gravity CG_{ACP}. As those skilled in the art will understand, the center of gravity CG_{ACP} acts along a plane **80** that is skewed to the base **66**. In the particular embodiment illustrated, the plane **80** is substantially perpendicular to the base **66** since the base **66** is situated on a flat surface **82**, such as a floor.

[**0057**] With reference to **FIGS. 3 and 7**, the handle **18** is configured to be gripped by a palmar surface **90** of the hand **92** of a user **94** when the user **94** is transporting the air compressor package **10**. The handle **18** may be of any type and may be mounted to any appropriate structure, such as the support structure **16** or the air tank **14**. In the particular embodiment illustrated, the handle **18** is fixedly mounted to air tank **14** and includes a grip portion **96** that is contoured to receive the fingers of the user when the user is transporting the air compressor package **10**. The grip portion **96** is formed about a centerline **98** that lies in (or is positionable into) a plane **100** that includes the center of gravity CG_{ACP} of the air compressor package **10**.

[**0058**] The handle **18** permits the user of the air compressor package **10** to reposition the air compressor package **10** from the operational position that is illustrated in **FIG. 4** to a transport position that is illustrated in **FIG. 7A**. To facilitate repositioning of the air compressor package **10** in this manner, a protective stop **69** may be fastened with, for example, conventional threaded fasteners (not shown) to each of the laterally extending sides **32** of the tubular frame **30**. The protective stops **69** are preferably comprised of rubber or some other type of material having an adhesive characteristic. In some instances, the user may roll air compressor package onto its side as shown in **FIG. 7B**. In these instances, the protective stops **69** prevent any unwanted slippage of the air compressor package away from the user. When positioned in the transport position, the plane **100** that includes the centerline **98** of the handle **18** and the center of gravity CG_{ACP} of the air compressor package **10** is located in a substantially vertical orientation that is generally parallel to a vertical (longitudinal) axis **104** of the user **94**, as well as generally parallel to the base **66** and the top **108** of the air compressor package **10**.

[**0059**] Furthermore, since the center of gravity CG_{ACP} of the air compressor package **10** is relatively close to the base **66** when the air compressor package **10** is oriented in the operational position, the user **94** is able to transport the air compressor package **10** such that the base **66** is proximate a lateral side **110** of the user **94** (i.e., within about 10 inches of the lateral side **110**, and preferably about 3 inches to about 7 inches) and the user's wrist **112** is not in a state of flexion. When placed in the transport position, the air compressor package **10** is preferably configured such that the centers of gravity CG_{AT} and CG_{AC} of the air tank **14** and the compressor mechanism **12** are disposed in the plane **100**, or oppositely offset therefrom by substantially equal distances. With the handle **18** thus positioned, the user **94** is able to comfortably carry the air compressor package **10**, as well as to easily pivot the air compressor package **10** between the operational position and the transport position without releasing the handle **18**.

[**0060**] While the air compressor package **10** has been described thus far as including an air tank **14** with a single cylindrically shaped tank structure and a handle **18** that is fixedly coupled to the air tank **14**, those skilled in the art will appreciate that the invention, in its broader aspects, may be constructed somewhat differently. For example, the handle **18***a* may be incorporated into the support structure **16***a* as illustrated in **FIGS. 8 and 9**. In this embodiment, the support structure **16** extends around the air tank **14** on a side opposite the compressor mechanism **12** and upwardly from the base **66**. A grip structure **96***a* is formed on the front strut member **36***a* that interconnects the opposite laterally extending sides **32***a*. Like the handle **18** of the air compressor package **10** that is illustrated in **FIG. 3**, the handle **18***a* is positioned such that a centerline **98***a* of the grip structure **96***a* is positioned in a plane that contains the center of gravity CG_{ACP} of the air compressor package **10***a* when the air compressor package **10***a* is positioned in the transport position.

[**0061**] In the arrangement of **FIG. 10**, the handle **18***a* is similar to that of the embodiment of **FIG. 8** in that it is incorporated with the support structure **16***a*. The air tank **14***b*, however, includes first and second generally cylindrical tank structures **150***a* and **150***b* which are stacked vertically relative to one another when the air compressor package **10***b* is placed in the operating position. In the arrangement illustrated, the first and second generally cylindrical tank

structures **150***a* and **150***b* are disposed equidistantly on opposite sides of the plane (not specifically shown) that includes the centerline **98***a* of the handle **18***a* and the center of gravity CG_{ACP}. The longitudinal axes **152***a* and **152***b* of first and second generally cylindrical tank structures **150***a* and **150***b*, respectively, are illustrated to contained in a plane that is skewed to the base **66** to thereby minimize the amount by which the first and second generally cylindrical tank structures **150***a* and **150***b* are offset from the plane that includes the centerline **98***a* of the handle **18***a* and the center of gravity CG_{ACP}. In this arrangement, the mounting platform **34***b* may be elevated slightly relative to the mounting platform **34** of the air compressor package **10** so as to more easily and compactly package the air tank **14***b* and the compressor mechanism **12** so that the centerline **98***a* of the handle **18***a* is positioned in the manner described above.

[**0062**] The arrangement of **FIG. 11** is generally similar to that of **FIG. 3**, except that the handle **18***c* is pivotably coupled to the support structure **16***c* on a side opposite the air tank **14**. When positioned into the transport position, the compressor mechanism **12** is situated above the air tank **14**. This arrangement also illustrates that the air compressor package of the present invention may be rotated about a generally horizontal axis between the operational and transport positions in any direction. For example, the embodiment of **FIGS. 6 and 7** illustrate that the air compressor package **10** may be rotated from the front F of the air compressor package **10** to the bottom B (or top T) of the air compressor package **10**, whereas the embodiment of **FIG. 11** illustrates that the air compressor package **10***c* may be rotated from the rear R of the air compressor package **10***c* to the bottom B (or top T) of the air compressor package **10***c*. Those skilled in the art will understand that the air compressor package may alternatively be configured to rotated from a side of the air compressor package to the bottom (or top) of the air compressor package via handle **18***c*.

[**0063**] With reference to **FIGS. 12 and 13**, another air compressor package constructed in accordance with the teachings of the present invention is generally indicated by reference numeral **10***d*. The air compressor package **10***d* is somewhat similar to the air compressor package **10** illustrated in **FIG. 3** and may include a compressor mechanism **12**, an air tank **14**, a support structure **16**, a handle **18** and a gauge package **20**. The compressor mechanism **12** may include an oil-less or oil-free compressor **22***d* and a power source, such as an electric motor **24** or an engine, for providing power to the oil-less compressor **22***d*. The oil-less compressor **22***d* includes a piston **300** that reciprocates along an axis **302** to intake and compress ambient air. The term oil-less is used herein to describe an air compressor that that does not use sump for holding a liquid oil for lubrication of the piston **300** as it reciprocates. Preferably, the entire compressor **22***d*, including the crankcase (not shown), may be operated without a liquid lubricating oil. The compressed air that exits the compressor **22***d* is discharged to the air tank **14**, which serves as a reservoir for the compressed air.

[**0064**] The air tank **14** may have a capacity of at least 0.5 gallons and in the particular example provided, is illustrated as having a single cylindrically shaped tank structure. The air tank **14**, however, may have a capacity of about 1 to about 8 gallons, and more preferably a capacity of about 3 to about 5 gallons.

[**0065**] The support structure **16** may include a pair of tubular supports **30***d* and a mounting platform **34***d*. The mounting platform **34***d* may include a base member **310** and a pair of side members **312** that may be coupled to and extend outwardly from the base member **310**. With additional reference to **FIG. 14**, each side member **312** may include an arcuate end surface **314** that is configured to abut a portion of the perimeter of the air tank **14** when the base member **310** is abutted against the air tank **14**. While the base member **310** may be abutted against the air tank **14** at any location in the lower quadrant **320** of the air tank, an upper surface **322** of the base member **310** may be positioned such that it is generally parallel to a first plane **324** that extends longitudinally through and bisects the air tank **14** and an edge **326** of the base member **310** terminates at a point that is included in a second plane **328** that is generally perpendicular to the first plane **324** and which extends longitudinally through and bisects the air tank **14**. Configuration in this manner positions a center of gravity of the air tank **14** (i.e., CG_{AT}) relatively close to the base member **310** and prevents the air tank **14** from extending below the mounting platform **34***d*. Those of ordinary skill in the art will appreciate that exact alignment of the edge **326** to the plane **328** cannot be reliably accomplished on a mass-production basis and as such, it will be understood for the purposes of this disclosure and the appended claims that the edge **326** is positioned in the plane **328** when a deviation between the edge **326** and the plane **328** is less than or equal to 0.25 inch (i.e., 0.25 inch on either side of the plane **328**).

[**0066**] A first end of the tubular supports **30***d* may be coupled to the base member **310** and a second, opposite end of the tubular supports **30***d* may be coupled to the air tank **14**. The tubular supports **30***d* are positioned on opposite sides of the compressor mechanism **12** to thereby protect the compressor mechanism **12** should the air compressor package **10***d* be overturned or impacted by another object.

[**0067**] In the example provided, a shroud **330**, which may be formed from a sheet metal or plastic material, may be removably coupled to the support structure **16** and/or the compressor mechanism **12**. While the primary purpose of the shroud **330** is to protect components such as the compressor mechanism **12** and the gauge package **20** from damaging contact with, for example, falling tools and workpieces, those skilled in the art will understand that the relatively smooth outer surface of the shroud **330**, if abutted against the lateral side of the user during transport, is relatively more comfortable and less likely to interfere with the movement of the user as compared to other portions of the air compressor package **10***d*.

[**0068**] The gauge package **20** may conventionally include an air tank pressure gauge (not shown), a regulator (not shown), a regulator gauge (not shown) and an outlet manifold **52**, and may be mounted to any convenient point, such as to the air tank **14**, the support structure **16** or the compressor **22***d*.

[**0069**] The compressor mechanism **12** may be coupled to the mounting platform **34***d* via a plurality of threaded fasteners (not specifically shown). A plurality of rubber feet **68** may be affixed to the corners of the mounting platform **34***d* to dampen vibrations that are transmitted through the support structure **16** as well as to provide the support structure **16** with a degree of skid resistance. An access

aperture (not specifically shown), similar to the access aperture **70** in **FIG. 6**, may be formed through the mounting platform **34***d* to permit the user to access a valve mechanism **72** to manually drain the air tank **14**.

[**0070**] With specific reference to **FIG. 14**, the air tank **14** and the compressor mechanism **12** may be coupled to the support structure **16** such that their centers of gravity, CG_{AT} and CG_{AC}, respectively, are positioned relatively close to the base member **310**. As the air tank **14** and the compressor mechanism **12** account for a majority of the weight of the air compressor package **10***d*, configuration in this manner is advantageous in that it provides the air compressor package **10***d* with a center of gravity CG_{ACP} that is located relatively close to a surface onto which the air compressor package **10***d* has been placed, thereby rendering the air compressor package **10***d* relatively resistant to tipping.

[**0071**] The handle **18** may be of any type and may be mounted to any appropriate structure, such as the support structure **16** or the air tank **14**. In the particular embodiment illustrated, the handle **18** is fixedly mounted to air tank **14** and includes a grip portion **96** (**FIG. 12**) that is contoured to receive the fingers of the user when the user is transporting the air compressor package **10***d*. The grip portion **96** (**FIG. 12**) is formed about a centerline **98** that lies in (or is positionable into) a plane (e.g., plane **324**) that includes the center of gravity CG_{ACP} of the air compressor package **10***d*.

[**0072**] The handle **18** permits the user of the air compressor package **10***d* to reposition the air compressor package **10***d* from the operational position that is illustrated in **FIG. 14** to a transport position that is similar to that which is illustrated for the air compressor package **10** in **FIG. 7**. In the transport position, the user may carry the air compressor package **10***d* with the lower surface of the base member **310** positioned proximate their lateral side or in the alternative, with the shroud **330** is positioned proximate their lateral side. In the particular example provided, the dimension between the first plane **324** and the tubular supports **30***d* is not equal to the dimension between the first plane **324** and the lower surface of the base member **310**. Construction in this manner permits the user to transport the air compressor package **10***d* in two distinct manners. Since the air tank **14** is placed directly onto the base member **310** of the mounting platform **34***d*, the center of gravity CG_{ACP} of the air compressor package **10***d* is relatively closer to the base member **310** as compared to the embodiments of **FIGS. 3 through 11** and as such, some users will find the air compressor package **10***d* more easy to transport than the air compressor package **10** of **FIG. 3**, since this configuration permits the air compressor package **10***d* to be transported relatively closer to the lateral side of a user.

[**0073**] As will be apparent to one of ordinary skill in the art in light of this disclosure, placement of the air compressor package **10***d* in the operating position places the axis **302** along which the piston **300** (**FIG. 12**) reciprocates in a generally horizontally orientation, while placement of the air compressor package **10***d* in the transport position places the axis **302** in a generally vertical orientation.

[**0074**] An alternative arrangement for an air compressor package **120** constructed in accordance with the teaching of the present invention is depicted in **FIGS. 15 through 20**. In this embodiment, an air compressor mechanism **122** is mounted between a pair of cylindrically shaped air tanks **124**. As shown, the air tanks are spaced apart laterally from each other and supported on the underside by a pair of skid bars **126**. The skid bars **126** are likewise spaced apart laterally from each other, but mounted transversely to the two air tanks **124**. A rubber foot **128** is affixed to each end of each skid bar **126**. These rubber feet **128** serve to dampen vibrations that are transmitted through the support structure during operation as well as provide a degree of skid resistance when placed in an operational position.

[**0075**] As described above, the air compressor mechanism **122** further comprises a compressor **132** operable to intake and compress ambient air and a power source **134**, such as an electric motor or an engine, for providing power to the compressor. The compressor mechanism is again of a conventional construction and operation and as such does not need to be described in further detail.

[**0076**] A shroud assembly **140** protects the compressor mechanism and associated components should the air compressor package **120** be overturned or impacted by another object. In an exemplary embodiment, the shroud assembly **140** includes a protective plate **142** extending between a pair of inverted u-shaped tubular members **144**. Ends of the tubular members **144** are coupled by conventional means, such as welds, to the top surface of the air tanks **124**. The protective plate is in turn coupled to the tubular members **144**. The protective plate is formed from a sheet or material, such as steel, aluminum, plastic or other suitable material, and is removably fastened with, for example, conventional threaded fasteners to the tubular frame.

[**0077**] A portion of the protective plate serves as a gauge panel **146** which supports conventional compressor accessory components, such as pressure gauges, a pressure regulator and one or more outlet manifolds. The gauge panel **146** is preferably sloped rearwardly in a manner that improves readability and accessibility of the gauges housed in the panel.

[**0078**] To transport the air compressor package **120**, a handle extends outwardly from either side of the air compressor package **120**. In the exemplary embodiment, the handle **150** is a tubular member which extends between the two u-shaped tubular members **144**. It is contemplated that the handle **150** may include a grip portion that is contoured to receive the user's fingers. It is also contemplated that the handle may have other configurations and be mounted to other appropriate support structure, such as one of the air tanks. Again, the grip portion is preferably formed about a centerline that lies in (or is positionable into) a plane that includes the center of gravity CG_{ACP} of the air compressor package **120**. The handle **150** enables the user to rotate the air compressor package **120** to an intermediate position as shown in **FIG. 21** prior to reaching a transport position as shown in **FIG. 22**.

[**0079**] Protective stops **152** are again used to prevent any unwanted slippage of the air compressor package away from the user. In this embodiment, the protective stops **152** are fastened to the air tank disposed on an opposite side from the handle **150**. More specifically, the protective stops **152** are fastened to a mounting bracket **154** which in turn is coupled to the air tank by conventional means, such as welds, as best seen in **FIG. 20**. The protective stops **69** are preferably comprised of rubber or some other type of material having an adhesive characteristic. The protective stops **152** also

protect the air tank from the rough surface and/or abrupt landings which may be encountered as the air compressor package is returned to an operational position.

[0080] When positioned in the transport position, the plane **160** that includes the centerline **162** of the handle **150** and a center of gravity CG_{ACP} of the air compressor package **120** is located in a substantially vertical orientation that is generally parallel to a vertical (longitudinal) axis **104** of the user **94**, as well as generally parallel to a base and a top **108** of the air compressor package **120**. Furthermore, since the center of gravity CG_{ACP} of the air compressor package **120** is relatively close to the base when the air compressor package **120** is oriented in the operational position, the user **94** is able to transport the air compressor package **120** such that the base is proximate a lateral side **110** of the user **94** (i.e., within about 10 inches of the lateral side **110**, and preferably about 3 inches to about 7 inches) and the user's wrist **112** is not in a state of flexion. With the handle **150** thus positioned, the user **94** is able to comfortably carry the air compressor package **120**, as well as to easily pivot the air compressor package **120** between the operational position and the transport position without releasing the handle **150**.

[0081] With reference to **FIGS. 23 through 25**, another air compressor package constructed in accordance with the teachings of the present disclosure is generally indicated by reference numeral **500**. The air compressor package **500** can include a compressor mechanism **512**, an air tank **514**, a support structure **516**, a handle **518** and a gauge package **520**. The compressor mechanism **512** can be conventional in its construction and operation and as such, need not be discussed in detail herein. In the particular example provided, the compressor mechanism **512** is generally similar to the compressor mechanism **12** associated with the embodiment of **FIGS. 12 and 13**. In this regard, the compressor mechanism **512** includes an oil-less compressor that is driven by an electric motor.

[0082] The air tank **514** may have a capacity of at least 0.5 gallons and in the particular example provided, is illustrated as having a single cylindrically shaped tank structure. The air tank **514**, however, may have a capacity of about 1 to about 8 gallons, e.g., a capacity of about 3 to about 5 gallons.

[0083] The support structure **516** can be configured in a "roll-cage" manner that extends around both the compressor mechanism **512** and the air tank **514** to protect these components should the air compressor package **500** be overturned or impacted by another object. In the particular embodiment illustrated, the support structure **516** includes a tubular frame **530** having opposite laterally extending sides **532** and the handle **518**, which interconnects the opposite laterally extending sides **532**. The support structure **516** can further include a plurality of strut members **536**, as well as an optional shield or cover **538** and a plurality of fastening tabs **539** (**FIG. 25**). The strut member **536** can be welded to the laterally extending side members **532** and can be fixedly but removably coupled to the compressor mechanism **512** via threaded fasteners (not shown) in a conventional and well known manner.

[0084] In the example provided, the laterally extending sides **532** are constructed to include a first leg **580**, a second leg **582** and an arm **584** that is disposed between and interconnects the first and second leg **582**. The first leg **580** can be received under a first side of the compressor mechanism **512** and under the air tank **514** to support compressor mechanism **512** and air tank **514**. The second leg **582** can include a first portion **586**, which can be coupled to the arm **584** and which can be generally parallel to the first leg **580**, and a second portion **588** that interconnects the handle **518** and the first portion **586**. The second portion **588** can extends downwardly toward the first leg **580** and outwardly beyond the air tank **514** toward the handle **518**. It will be appreciated that the air tank **514** has a generally cylindrical shape and extends longitudinally between the side members **532** such that the air tank **514** abuts the first legs **580** and the second portion **588** of the second legs **582**.

[0085] The cover **538** can be formed from a sheet material, such as steel, aluminum or plastic. The fastening tabs **529** can be welded to the tubular frame **530** and can include a threaded aperture (not shown). In the alternative, the fastening tabs **529** can include a through-hole (not specifically shown) that can be aligned to a thread form (not specifically shown) that is defined by a sheet metal clip **541** (**FIG. 25**) that can be engaged to an associated fastening tab **529**. In either arrangement, the cover **538** can be coupled to the tubular frame **530** via conventional fasteners (not specifically shown), but the sheet metal clips **541** (**FIG. 25**) are advantageous in that they are relative less expensive and more tolerant of manufacturing variation. While the primary purpose of the cover **538** is to protect components such as the compressor mechanism **512** and the gauge package **520** from damaging contact with, for example, falling tools and workpieces, those skilled in the art will understand that the relatively smooth outer surface of the cover **538**, when abutted against the lateral side of the user during transport, is relatively more comfortable and less likely to interfere with the movement of the user as compared to the tubular frame **530**, the compressor mechanism, the air tank **514** and/or the gauge package **520**.

[0086] The gauge package **520** can include an air tank pressure gauge **546**, a user-adjustable regulator valve **548**, a regulator gauge **550** and an outlet manifold **552**, is coupled to a gauge panel **554** that is mounted between the laterally extending sides **532** of the support structure **516**. The gauge panel **554** may be a discrete component or may be integrally formed with the cover **538**. Preferably, the gauge panel **554** is mounted in a rearwardly sloped orientation, which is best illustrated in **FIG. 23**, as opposed to the substantially vertical orientation that is illustrated in the prior art air compressor package **1** of **FIG. 1**, so as to position the air tank pressure gauge **546**, the regulator **548**, the regulator gauge **550** and the outlet manifold **552** in a manner that is relatively more comfortable for the user of the air compressor package **500** to read and/or access. As those skilled in the art will appreciate from this disclosure, the improved readability of the air tank pressure gauge **546** and the regulator gauge **550** and the improved accessibility of the regulator **548** that result from the positioning of the gauge panel **554** in a rearwardly sloped orientation improves the accuracy with which the user is able to control the air pressure that is delivered to the outlet manifold **552**. Pegs **558**, which are coupled to one of the laterally extending sides **532** and extend outwardly therefrom, are optionally provided so as to permit items, such as a power cord **560** or an air hose (not shown), to be coiled around the pegs **558** for storage.

[0087] A plurality of resilient feet **568** can be affixed to the corners of the tubular frame **530** and serve to dampen

vibrations that are transmitted through the support structure **516** as well as to provide the support structure **516** with a degree of skid resistance.

[**0088**] With reference to **FIGS. 24 and 26**, the air compressor package **500** is also shown to include a manifold **600**. The manifold **600** can include a manifold body **602** that can have a threaded portion **604** that is adapted to be threadably coupled to the air tank **514**. The manifold body **602** can define an inlet port **610**, an outlet port **612**, a pressure port **614**, a relief port **616**, and a drain port **618**. The inlet port **610** is coupled in fluid connection to the compressor mechanism **512** and the air tank **514**. Outlet port **612** is coupled in fluid connection to the air tank **514** and the pressure regulator valve **548**. Pressure port **614** is coupled in fluid connection to the air tank **514** and a pressure switch **615** that is associated with the compressor mechanism **512**. Relief port **616** is coupled in fluid connection to the air tank **514** and a relief valve **617**. Drain port **618** is coupled in fluid connection to the air tank **514** and a drain valve **619**. In the particular example provided, the manifold body **602** is unitarily formed from a suitable material, such as zinc, e.g., in a casting process (e.g., die casting) and can be, e.g., machined as necessary thereafter.

[**0089**] With reference to **FIGS. 27 and 28**, the inlet port **610** can include a first coupling **650** and an outlet zone **652** that is disposed within an annular cavity **654** that is defined by a wall member **656** of the manifold body **602**. The first coupling **650** is illustrated to include female pipe threads, but those of ordinary skill in the art will appreciate that any other coupling means (e.g., male pipe threads, quick couplings, a hose barb, flare fittings or interfaces) may be employed.

[**0090**] The outlet port **612** can include an inlet zone **662**, which is disposed within the annular cavity **654**, and a second coupling **664**, which is illustrated to include a male hose barb. Those of ordinary skill in the art will appreciate that any other coupling means (e.g., male pipe threads, quick couplings, a hose barb, flare fittings or interfaces) may be employed. In the example provided, the outlet port **612** is segregated or separate from the inlet port **610** (e.g., the hole formed in the manifold body **602** that defines the inlet port **610** can be formed separately from the hole in the manifold body **602** that defines the outlet port **612**). Construction in this manner permits air from the compressor mechanism **512** (**FIG. 22**) to be directed into the air tank **514** (**FIG. 22**) rather than toward the outlet port **612**.

[**0091**] With reference to **FIGS. 27 and 29**, the pressure port **614** can include a third coupling **670**, such as a male hose barb, and can intersect the outlet port **612** or the cavity **654** to permit air from the air tank **514** (**FIG. 24**) to operate the pressure switch **615** (**FIG. 26**) that is associated with the compressor mechanism **512** (**FIG. 24**). As those of ordinary skill in the art will appreciate, the pressure switch **615** (**FIG. 26**) is employed to actuate the power source that operates the compressor mechanism **512** (**FIG. 24**) when the air pressure in the air tank **514** (**FIG. 24**) is less than a predetermined air pressure threshold.

[**0092**] The relief port **616** can include a fourth coupling **674**, such as female pipe threads, and can intersect the outlet port **612** or the cavity **654** to permit air from the air tank **514** (**FIG. 24**) to act on the relief valve **617** (**FIG. 26**). As those of ordinary skill in the art will appreciate, the relief valve **617** (**FIG. 26**) can be a normally closed valve that opens when the air pressure that is acting on it is greater than a predetermined air pressure.

[**0093**] With reference to **FIGS. 27 and 30**, the drain port **618** can be formed in the manifold body **602** such that drain port **618** is fluidly isolated from the inlet port **610**, the outlet port **612**, and the cavity **654**. In the particular example provided, the drain port **618** is formed in a portion of the manifold body **602** so as not to intersect the cavity **654** that is defined by the wall member **656**. The drain port **618** includes a central portion **680**, which extends longitudinally through the manifold body **602**, an inlet **682**, which is formed through a portion of the wall member **656**, and an outlet **684**. The outlet **684** can include a fifth coupling **686**, such a female pipe threads.

[**0094**] With reference to **FIGS. 31 and 32**, the manifold **600** is installed to the air tank **514** such that the inlet **682** of the drain port **618** is disposed below an end **700** of the manifold body **602** through which the inlet port **610** and the outlet port **612** (**FIG. 27**) communicate with the air tank **514** when the air compressor package **500** (**FIG. 24**) is positioned in an operating position, which is illustrated in **FIG. 22**. The drain valve **619**, which can be a conventional ball valve, can be coupled to the outlet **684** of the drain port **618**. Configuration of the manifold **600** in this manner permits fluids that have accumulated in the air tank **514** to drain into the drain port **618** and not into the inlet port **610**, the outlet port **612** (**FIG. 27**), the pressure port **614** (**FIG. 27**) or the relief port **616**. As such, the various ports may be combined into a single manifold that is attached to the air tank **514** at a single location, which is relatively less expensive to manufacture than an air tank that employs multiple mounting locations for the various ports.

[**0095**] While specific examples have been described in the specification and illustrated in the drawings, it will be understood by those of ordinary skill in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the present disclosure as defined in the claims. Furthermore, the mixing and matching of features, elements and/or functions between various examples is expressly contemplated herein so that one of ordinary skill in the art would appreciate from this disclosure that features, elements and/or functions of one example may be incorporated into another example as appropriate, unless described otherwise, above. Moreover, many modifications may be made to adapt a particular situation or material to the teachings of the present disclosure without departing from the essential scope thereof. Therefore, it is intended that the present disclosure not be limited to the particular examples illustrated by the drawings and described in the specification as the best mode presently contemplated for carrying out this disclosure, but that the scope of the present disclosure will include any embodiments falling within the foregoing description and the appended claims.

What is claimed is:

1. An air compressor comprising:

a support structure, a compressor and an air tank in fluid connection with the compressor, the air tank having a capacity of at least 0.5 gallons, the support structure including a frame that defines a side member and a handle that extends from the side member, the side

member including a first leg, an arm and a second leg, the first leg being disposed under a first side of the compressor and being secured to the air tank at a first location, the second leg having a first portion, which is generally parallel to the first leg, and a second portion that extends downwardly toward the first leg and outwardly toward the handle, the air tank having a generally cylindrical shape, the air tank abutting the first leg and the second portion of the second leg;

wherein the handle is configured to be grasped by a hand of a user so that the air compressor can be rotated about an axis that is generally parallel to a longitudinal axis of the air tank between an operating position and a hand-carried transport position.

2. The air compressor of claim 1, wherein the compressor comprises a substantially oil-less pump.

3. The air compressor of claim 1, wherein air compressor further includes a shroud member and the support structure further includes one or more tab members that are coupled to the frame, the shroud member being coupled to the tab members.

4. The air compressor of claim 3, further comprising:

a manifold assembly having a regulator, which is coupled in fluid connection to the air tank;

a coupling;

a first gauge, which is adapted to sense a pressure of air in the air tank; and

a second gauge, which is adapted to sense a pressure in a portion of the manifold assembly between the regulator and the coupling.

5. The air compressor of claim 4, wherein the manifold assembly is removably coupled to the shroud.

6. The air compressor of claim 1, wherein the support structure further includes a pair of struts that are fixedly coupled to the first leg.

7. The air compressor of claim 6, wherein the compressor is mounted to the strut members.

8. The air compressor of claim 1, wherein the support structure further includes a pair of feet and wherein the axis about which the air compressor can be rotated is defined by the feet.

9. A method comprising:

providing an air compressor having a support structure, a compressor, an air tank, and a handle, the air tank being in fluid connection with the compressor and having a capacity that is greater than about 0.5 gallons, the handle being coupled to at least one of the support structure and the air tank, the support structure defining a base;

placing the air compressor apparatus in an operating position wherein the base is disposed in a first orientation; and

moving the air compressor apparatus to a hand-carried transport position by rotating the air compressor apparatus by the handle about an axis that is generally parallel to the handle, the base being disposed in a second orientation that is generally perpendicular to the first orientation when the air compressor apparatus is in the hand-carried transport position.

10. The method of claim 9, wherein the air tank is disposed between the handle and the compressor.

11. The method of claim 10, wherein the support structure includes a tubular frame that defines a pair side members and the handle, the handle being disposed between and connecting the side members, each side member including a first leg, an arm and a second leg, the first leg being disposed under a first side of the compressor and being secured to the tank at a first location, the second leg having a first portion, which is generally parallel to the first leg, and a second portion that extends downwardly toward the first leg and outwardly toward the handle.

12. The method of claim 10, wherein the handle is mounted to the air tank.

13. An air compressor comprising:

a compressor;

an air tank having a tank wall that defines a tank cavity;

a pressure regulator; and

a manifold with a manifold body that includes an inlet port and an outlet port, the manifold body being coupled to the air tank, the inlet port being coupled in fluid connection to tank cavity and the compressor, the outlet port being separate from the inlet port, the outlet port being in fluid connection with the tank cavity and the pressure regulator.

14. The air compressor of claim 13, wherein the manifold body further includes a relief port that is separate from the inlet port and the outlet port, and wherein a relief valve is coupled to the relief port.

15. The air compressor of claim 13, wherein the manifold body further includes a pressure port that is coupled in fluid connection to a pressure switch.

16. The air compressor of claim 13, wherein the manifold body further includes a drain port that is fluidly isolated from the inlet port and the outlet port, wherein the drain port is in fluid communication with the tank cavity.

17. The air compressor of claim 16, wherein the drain port includes a drain port inlet that is disposed in the tank cavity at a position that is relatively lower than an end of the manifold body through which the inlet port and the outlet port are in fluid communication with the air tank.

18. The air compressor of claim 16, wherein the manifold body further includes a manifold wall that defines a manifold cavity and wherein the inlet port and the outlet port intersect the manifold cavity and wherein the drain port inlet is an aperture that is formed partially through the manifold wall member.

19. The air compressor of claim 13, wherein the manifold body further includes a manifold wall that defines a manifold cavity and wherein the inlet port and the outlet port intersect the manifold cavity.

20. The air compressor of claim 13, further comprising a drain valve coupled to the drain port.

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