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(54) **GAS COMPRESSION SYSTEM**

GASKOMPRESSIONSSYSTEM

SYSTÈME DE COMPRESSION DE GAZ

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Description

[0001] The present invention relates to a gas compression system.

[0002] Oil-pressure systems for compressing a gas are known, wherein a gas is compressed in order to reduce its volume for easier storage and easier distribution.

[0003] Fig. 1 shows a generic oil-pressure system for compressing a gas of the prior art, which is generally indicated with reference numeral (100). The system (100) comprises a hydraulic compressor (C) connected to a suction conduit (6) and to a delivery conduit (7) suitable for letting in the gas to be compressed and for letting out the compressed gas, respectively.

[0004] The hydraulic compressor (C) is provided with press means for compressing the gas that are actuated by pressurized oil fed by a hydraulic circuit (I). Pressure adjusting means (R) are connected to the hydraulic circuit (I) to adjust the pressure of the oil to be fed to the hydraulic compressor (C) at a pressure value that is sufficient to compress the gas at the desired pressure.

[0005] With reference to Fig. 2, the hydraulic compressor comprises a piston (1) disposed in a cylinder (2) and the hydraulic circuit (I) comprises a pump (P) connected to a motor (M) to pressurize the oil that pushes the piston (1). The piston (1) pushes the gas in the cylinder (2) and compresses the gas at a desired pressure.

[0006] A cylinder with a partition (20) and a double piston with a stem (10) that passes through the partition (20) and two plungers (11, 12) at the ends of the stem are generally used to recover the forward and backward travels of the piston. In view of the above, the cylinder (2) is divided into four chambers: a first oil chamber (A), a second oil chamber (B), a first gas chamber (G1) and a second gas chamber (G2).

[0007] The first gas chamber (G1) and the second gas chamber (G2) respectively communicate with a first fitting (3) and a second fitting (4) of three-way type. Each fitting (3, 4) comprises:

- a suction inlet (30, 40) suitable for being connected to the suction conduit (6) that provides the gas to be compressed,
- a delivery outlet (31, 41) suitable for being connected to the delivery conduit (7) that transports the compressed gas, and
- a communication conduit (32, 42) in communication with the respective gas chamber (G1, G2) of the cylinder.

[0008] Unidirectional valves are disposed in the suction inlets (30, 40) and in the delivery outlets (31, 41) to guarantee the gas flow during suction and delivery.

[0009] In order to permit an alternate movement of the piston (1), the oil must alternately go into the first oil chamber (A) firstly and then into the second oil chamber (B). In order to permit such an alternate oil flow, a reversing valve (5) is normally provided between the pump (P) and the partition (20) of the cylinder (2) to alternately send the oil into the first oil chamber (A) and into the second oil chamber (B).

[0010] The pressure adjusting means (R) are embedded in the reversing valve (5) to adjust the oil pressure.

[0011] The pressure adjusting means (R) of the reversing valves of the gas compression systems according to the prior art are manually regulated. The reversing valve (5) has two pressure regulators (5A, 5B) of manual type that adjust the pressure of the oil sent into the first oil chamber (A) and into the second oil chamber (B), respectively. The pressure regulators (5A, 5B) are controlled by means of adjusting screws (50A, 50B) that are operated manually by the operator.

[0012] The delivery conduit (7) has a pressure switch (70) that is adjusted by the operator according to the delivery pressure, namely the desired gas compression pressure.

[0013] For illustrative purposes, if the suction pressure is 100 bar and the desired delivery pressure is 220 bar, an oil pressure of 150 bar will be necessary, with a 18 kw absorption of the motor of the pump, considering a residual thrust of 45 kN on the piston.

[0014] In order to do this, nowadays, the operator goes to the installation, adjusts the pressure switch (70) at a pressure of 220 bar, lets the suction gas in the first gas chamber (G1) and operates the reversing valve (5) manually. Otherwise said, the user manually adjusts the adjusting screw (50A) of the first pressure regulator of the reversing valve (5), increasing the oil pressure in the first oil chamber (A) until the first plunger (11) of the piston reaches the end of the compression travel because the oil has reached the pressure that is necessary to compress the gas at the pressure of 220 bar and the gas flows in the delivery conduit through the pressure switch (70). Now, the operator blocks the adjusting screw (50A), setting the adjustment of the first pressure regulator (5A).

[0015] With reference to the example, the user has set the reversing valve in such a way to have an oil pressure higher than 150 bar, with an approximation by excess.

[0016] The same procedure will be applied to adjust the oil pressure in the second oil chamber (B), by means of the adjusting screw (50B) of the second pressure regulator (50B) of the reversing valve that adjusts the oil pressure in the second oil chamber (B).

[0017] Considering that it is a manual operation, it will be extremely difficult for the operator to set the pressure values in the first oil chamber (A) and in the second oil chamber (B) in the same way.

[0018] Moreover, it must be considered that the gas suction pressure may vary.

[0019] For illustrative purposes, if the gas suction pressure drops from 100 bar to 90 bar, an oil pressure higher than 150 bar and equal to approximately 163 bar will be necessary to obtain a delivery pressure of 220 bar However, since the reversing valve is set to have an oil pressure of approximately 150 bar, the installation would be stopped because the oil pressure of 150 bar is not sufficient to obtain a gas compression of 220 bar. In such a case, the operator must adjust the oil pressure again with the adjusting screws (50A, 50B) of the reversing valve until an oil pressure of approximately 163 bar is reached.

[0020] On the contrary, for illustrative purposes, if the gas suction pressure increases from 100 bar to 110 bar, an oil pressure lower than 150 bar and equal to approximately 138 bar will be sufficient to obtain a delivery pressure of 220 bar. However, since the reversing valve is set to have an oil pressure of approximately 150 bar, the system would continue to operate, it being regulated for an oil pressure higher than the requested one, but it would be energetically inefficient because the motor (M) of the pump would consume more energy than necessary. In fact, the motor would absorb 18 kw to maintain an oil pressure of approximately 150 bar, when it could absorb 16.6 kw to maintain an oil pressure of 138 bar that is sufficient to compress the gas at the desired pressure of 220 bar.

[0021] Moreover, if the gas compression pressure changes, because of a request from the customer, once again, the operator must set the pressure regulators (5A, 5B) based on the desired compression pressure.

[0022] Furthermore, the travel of the piston (1) is fixed and adjusted in such a way that the speed of the piston (1) is equal to the speed at the maximum flow rate of the pump (M). Therefore, if the user intends to expand the gas compression system, using two hydraulic compressors (C), it will be necessary to purchase a new pump with a higher flow rate.

[0023] US5863186 discloses a gas compression system according to the preamble of claim 1. US5863186 does not specify the fluid of the hydraulic circuit, the provision of a pressure regulator embedded in a reversing valve connected to the hydraulic circuit and the provision of a third pressure transducer.

[0024] US2014/219830 discloses a gas compression system similar to the one of US5863186.

[0025] US2016230786A1 discloses a hydraulic pressure generation unit with pneumatic actuation.

[0026] US5238372A discloses a cooled spool piston compressor.

[0027] The purpose of the present invention is to eliminate the drawbacks of the prior art by disclosing a gas compression system that is accurate, reliable, versatile and efficient.

[0028] Another purpose of the present invention is to disclose such a gas compression system that is automated and capable of eliminating the human action and capable of adjusting to any pressure variations of the gas introduced in the compression system.

[0029] These purposes are achieved according to the invention with the characteristics of the independent claim 1.

[0030] Advantageous embodiments of the invention appear from the dependent claims.

[0031] The gas compression system according to the invention is defined by claim 1.

[0032] Additional features of the invention will be manifest from the following detailed description, which refers to a merely illustrative, not limiting embodiment, as shown in the appended figures, wherein:

Fig. 1 is a block diagram that diagrammatically shows a generic compression gas system according to the prior art;
Fig. 2 is a block diagram that diagrammatically shows a specific compression gas system according to the prior art;
Fig. 3 is a block diagram that diagrammatically shows a gas compression system according to the invention; and
Fig. 4 is a look-up table used in the PLC of the gas compression system according to the invention.

[0033] In the following description, elements that are identical or corresponding to the ones described above will be indicated with the same numerals, omitting their detailed description.

[0034] With reference to Fig. 3, the gas compression system of the invention is disclosed, which is generally indicated with reference numeral (200).

[0035] Instead of the manually controlled reversing valve (5), the gas compression system (200) provides for a reversing valve (8) that is electronically controlled by means of a programmable control logic (PLC) (9).

[0036] The electronic reversing valve (8) has a first way (8A) and a second way (8B) respectively connected to the first oil chamber (A) and to the second oil chamber (B) of the cylinder (2).

[0037] A shutter (80) is disposed inside the electronic reversing valve (8) and moves in alternate motion to alternately open and close the first way (8A) and the second way (8B) in such a way to alternately feed the first oil chamber (A) and the second oil chamber (B) of the cylinder (2).

[0038] The movement of the shutter (80) is controlled by the PLC (9).

[0039] The electronic reversing valve (8) also comprises pressure adjusting means (R) that consist in a pressure regulator (81) suitable for adjusting the oil pressure that passes from the first way (8A) and from the second way (8B) and reaches the first chamber (A) and the second chamber (B) of the cylinder. Unlike the reversing valves of the prior art, the pressure regulator (81) of the reversing valve (8) is electronically controlled by the PLC (9). The pressure regulator (81) has a mobile part that is moved by the PLC (9) according to the desired oil pressure.

[0040] In particular, the pressure regulator (81) is controlled by a control signal (S4), for example an electric signal of impulse type, from the PLC (9).

[0041] The gas compression system (200) comprises:

- a first pressure transducer (T1) disposed in the gas suction conduit (6) to measure the suction pressure of the inlet gas;

- a second pressure transducer (T2) disposed in the gas delivery conduit (7) to measure the delivery pressure of the outlet gas, and
- a third pressure transducer (T3) disposed in the reversing valve (8) to measure the pressure of the oil fed in the first chamber and in the second chamber of the cylinder.

[0042] Obviously, the second pressure transducer (T2) can be a pressure transducer embedded in the pressure switch (70) disposed in the delivery conduit (7).

[0043] The three pressure transducers (T1, T2, T3) are electrically connected to the PLC (9), in such a way that the PLC (9) receives electrical signals (S1, S2, S3) indicative of the pressure of the inlet gas, of the pressure of the outlet gas and of the pressure of the oil.

[0044] A look-up table is stored in the PLC (9). The look-up table contains possible suction pressure values, possible delivery pressure values, and corresponding oil pressure values calculated based on the suction pressure values and the delivery pressure values. In view of the above, a given oil pressure value uniquely corresponds to each pair composed of a suction pressure value and of a delivery pressure value. For illustrative purposes, the suction pressure values can vary from 0 to 250 bar and the delivery pressure values can vary from 10 bar to 250 bar.

[0045] Fig. 4 shows a similar look-up table wherein:

the suction pressure values vary from a_1 to a_n, wherein a_1 = 0 and a_n = 250 bar;
the delivery pressure values vary from b_1 to b_m, wherein b_1 = 10 bar and b_m = 250 bar;

[0046] The oil pressure values vary from c_{11} to c_{nm}, based on the suction pressure values and on the delivery pressure values.

[0047] For illustrative purposes, if the first transducer (T1) measures a suction pressure of 100 bar and the second transducer (T2) measures a delivery pressure of 220 bar, the look-up table gives an oil pressure value of 150 bar. Consequently, the PLC (9) controls the pressure regulator (81) of the reversing valve in such a way to obtain an oil pressure of 150 bar. When the third pressure transducer (T3) measures an oil pressure of 150 bar, the PLC (9) will control the shutter (80) of the reversing valve in such a way to move in alternate motion in order to alternately send the oil into the first oil chamber (A) and into the second oil chamber (B).

[0048] Since the look-up table of the PLC contains all possible suction pressure values and all possible delivery pressure values, in case of a variation of the suction pressure and of the delivery pressure, the gas compression system (200) will be self-adjusted, making gas compression possible with the maximum energy efficiency.

[0049] If the gas suction pressure drops to 90 bar, the gas compression system (200) will automatically adjust the oil pressure at 162 bar, permitting the standard operation of the installation.

[0050] On the contrary, if the gas suction pressure increases to 110 bar, the gas compression system (200) will automatically adjust the oil pressure at 138 bar, with an energy saving from 18 kw to 16.6 kw.

[0051] Moreover, the gas compression system (200) can adjust the quantity of oil to be sent to the first chamber (A) and to the second chamber (B) in order to reach the desired gas compression pressure. Otherwise said, the movement of the piston (1) is adjusted in such a way that the plungers (11, 12) do not reach the end of their travel (as in the prior art). In view of the above, the speed of the piston (1) is adjusted, and is not necessarily equal to the speed at the maximum flow rate of the pump (P). Therefore, if the user intends to expand the gas compression system, using two cylinder-piston assemblies, it will not be necessary to purchase a new pump with a higher flow rate, and it will be possible to use the same pump, by simply adjusting the travel of the pistons.

[0052] Although the present description refers to a hydraulic compressor (C) with a piston with two plungers (11, 12) and to a cylinder (2) with four chambers, the invention refers to any type of hydraulic compressor, such as a compressor with a piston with only one plunger disposed in a cylinder in such a way to generate two chambers: an oil chamber and a gas chamber. In any case, the hydraulic circuit (I) is suitably configured to fill and empty the oil chamber for the movement of the piston. The peculiarity of the invention consists in the fact that the pressure adjusting means (R) are electronically controlled by the PLC (9) to adjust the oil pressure based on the suction pressure values and on the delivery pressure values.

[0053] If an electronically controlled reversing valve (8) is used in the hydraulic circuit (I), the pressure adjusting means (R) consist in the pressure regulator (81) of the reversing valve.

[0054] Considering that the gas compression system (200) generally operates with explosive/flammable gases, advantageously the reversing valve (8) must be suitable for operating in zones with explosion/fire risks; for instance, the reversing valve (8) must be ATEX classified.

Claims

1. Gas compression system (200) comprising:

- a hydraulic compressor (C) suitable for compressing a gas; said hydraulic compressor (C) comprising a cylinder (2) and a piston (1) with at least one plunger (11, 12) disposed in the cylinder in such a way to generate at least one fluid chamber (A, B) and at least one gas chamber (G1, G2),
- a gas suction conduit (6) connected to said

hydraulic compressor (C) for the inlet of gas to be compressed,
- a gas delivery conduit (7) connected to said hydraulic compressor (C) for the outlet of compressed gas,
- a hydraulic circuit (I) connected to said hydraulic compressor (C) in order to hydraulically actuate said hydraulic compressor (C) by means of a pressurized fluid; and
- pressure adjusting means (R) connected to said hydraulic circuit (I) in order to adjust the pressure of the fluid fed in said hydraulic compressor (C),
- a reversing valve (8) connected to said hydraulic circuit (I); said reversing valve (8) comprising a shutter (80) that is moved with alternate motion to permit an alternate flow of fluid in the hydraulic circuit (I) in order to move the piston (1) alternately,
- a programmable logic circuit (PLC) (9),
- a first pressure transducer (T1) electrically connected to said PLC (9); said first pressure transducer (T1) being disposed in the gas suction conduit (6) to measure the suction pressure of the inlet gas, and
- a second pressure transducer (T2) electrically connected to said PLC (9); said second pressure transducer (T2) being disposed in the gas delivery conduit (7) to measure the delivery pressure of the outlet gas,

wherein said pressure adjusting means (R) are electronically controlled and electrically connected to said PLC (9); and
said PLC (9) is configured in such a way to electronically control the pressure adjusting means (R) in order to adjust the fluid pressure at a pressure value that is calculated based on the pressure values measured by said first pressure transducer (T1) and by said second pressure transducer (T2);
characterized in that
said hydraulic circuit (I) comprises a pump (P) actuated by a motor (M);
said fluid of the hydraulic circuit (I) is oil;
said reversing valve (8) comprises said pressure adjusting means (R) consisting in a pressure regulator (81) connected to said PLC;
said system (200) further comprises a third pressure transducer (T3) electrically connected to said PLC; said third pressure transducer (T3) being disposed in the reversing valve (8) to measure the pressure of the oil that is fed in said at least one oil chamber; and
said PLC (9) being suitably configured to actuate said shutter (80) of the reversing valve in alternate motion when the oil pressure measured by said third pressure transducer (T3) reaches said pressure value calculated based on the pressure values measured by said first pressure transducer (T1) and by said second pressure transducer (T2).

2. The system (200) of claim 1, wherein said PLC (9) comprises a look-up table that contains possible suction pressure vales, possible delivery pressure values, and corresponding oil pressure values that are calculated based on the suction pressure values and on the delivery pressure values.

3. The system (200) of claim 2, wherein said possible suction pressure values of the look-up table vary from 0 to 250 bars and said possible delivery pressure values of the look-up values vary from 10 to 250 bars.

4. The system (200) of any one of the preceding claims, comprising a pressure switch (70) disposed in said delivery conduit (7) and configured in such a way to let the gas pass when the gas pressure reaches the desired compression pressure, said second pressure transducer (T2) being embedded in said pressure switch (70).

5. The system (200) of any one of the preceding claims, wherein said piston (1) of the hydraulic compressor has two plungers (11, 12) and one stem (10) passing through a partition wall (20) disposed in the cylinder (2) in such a way to generate two oil chambers (A, B) and two gas chambers (G1, G2).

Patentansprüche

1. Gaskompressionssystem (200), umfassend:

- einen Hydraulikverdichter (C), der dazu geeignet ist, Gas zu verdichten, wobei der Hydraulikverdichter (C) einen Zylinder (2) und einen Kolben (1) mit mindestens einer Kolbenstange (11, 12) umfasst, die in dem Zylinder so angeordnet ist, dass mindestens eine Fluidkammer (A, B) und mindestens eine Gaskammer (G1, G2) erzeugt werden;
- eine Gasansaugleitung (6), die mit dem Hydraulikverdichter (C) zum Einlassen von zu verdichtendem Gas verbunden ist,
- eine Gasförderleitung (7), die mit dem Hydraulikverdichter (C) zum Auslassen von verdichtetem Gas verbunden ist,
- einen Hydraulikkreislauf (I), der mit dem Hydraulikverdichter (C) verbunden ist, um den Hydraulikverdichter (C) mittels eines druckbeauf-

schlagten Fluids hydraulisch zu betätigen; und
- Mittel zur Druckregulierung (R), die mit dem Hydraulikkreislauf (I) verbunden sind, um den Druck des in den Hydraulikverdichter (C) geförderten Fluids zu regulieren,
- ein Umschaltventil (8), das mit dem Hydraulikkreislauf (I) verbunden ist; wobei das Umschaltventil (8) einen alternierend beweglichen Schieber (80) umfasst, um eine alternierende Strömung des Fluids im Hydraulikkreislauf (I) zu erlauben, um den Kolben (1) alternierend zu bewegen,
- eine speicherprogrammierbare Steuerung (SPS) (9),
- einen ersten Druckwandler (T1), der elektrisch mit der SPS (9) verbunden ist; wobei der erste Druckwandler (T1) in der Gasansaugleitung (6) angeordnet ist, um den Ansaugdruck des einströmenden Gases zu messen, und
- einen zweiten Druckwandler (T2), der elektrisch mit der SPS (9) verbunden ist; wobei der zweite Druckwandler (T2) in der Gasförderleitung (7) angeordnet ist, um den Förderdruck des ausströmenden Gases zu messen,

wobei die Mittel zur Druckregulierung (R) elektronisch gesteuert sind und elektrisch mit der SPS (9) verbunden sind; und
die SPS (9) so konfiguriert ist, dass sie die Mittel zur Druckregulierung (R) elektronisch steuert, um den Druck des Fluids auf einen Druckwert zu regulieren, der auf der Grundlage der Druckwerte berechnet wird, die von dem ersten Druckwandler (T1) und dem zweiten Druckwandler (T2) erfasst werden,
dadurch gekennzeichnet, dass
der Hydraulikkreislauf (I) eine Pumpe (P) umfasst, die von einem Motor (M) betätigt wird;
das Fluid des Hydraulikkreislaufs (I) Öl ist;
das Umschaltventil (8) Mittel zur Druckregulierung (R) umfasst, die aus einem Druckregler (81) bestehen, der mit der SPS verbunden ist;
das System ferner einen dritten Druckwandler (T3) umfasst, der elektrisch mit der SPS verbunden ist; wobei der dritte Druckwandler (T3) in dem Umschaltventil (8) angeordnet ist, um den Druck des Öls, das in die mindestens eine Ölkammer gefördert wird, zu messen; und
die SPS (9) so konfiguriert ist, dass sie den Schieber (80) des Umschaltventils alternierend betätigt, wenn der von dem dritten Umschaltventil (T3) gemessene Öldruck den Druckwert erreicht, der auf der Grundlage der Druckwerte berechnet wird, die von dem ersten Druckwandler (T1) und dem zweiten Druckwandler (T2) gemessen werden.

2. System (200) nach Anspruch 1, wobei die SPS (9) eine Nachschlagtabelle umfasst, die mögliche Ansaugdruckwerte, mögliche Förderdruckwerte und entsprechende Öldruckwerte enthält, die auf der Grundlage der Ansaugdruckwerte und der Förderdruckwerte berechnet werden.

3. System (200) nach Anspruch 2, wobei die möglichen Ansaugdruckwerte der Nachschlagtabelle von 0 bis 250 bar variieren und die möglichen Förderdruckwerte von 10 bis 250 bar variieren.

4. System (200) nach einem der vorstehenden Ansprüche, umfassend einen Druckschalter (70), der in der Förderleitung (7) angeordnet ist und so konfiguriert ist, dass er das Gas durchlässt, wenn der Gasdruck den gewünschten Kompressionsdruck erreicht, wobei der zweite Druckwandler (T2) in dem Druckschalter (70) integriert ist.

5. System (200) nach einem der vorstehenden Ansprüche, wobei der Kolben (1) des Hydraulikverdichters zwei Kolbenstangen (11, 12) und einen Schaft (10) aufweist, der durch eine Trennwand (20) hindurchgeht, die in dem Zylinder (2) so angeordnet ist, dass zwei Ölkammern (A, B) und zwei Gaskammern (G1, G2) erzeugt werden.

Revendications

1. Système de compression du gaz (200) comprenant :

- un compresseur hydraulique (C) apte à comprimer le gaz ; ledit compresseur hydraulique (C) comprenant un cylindre (2) et un piston (1) ayant au moins un poussoir (11, 12) disposé dans le cylindre de manière à générer au moins une chambre de fluide (A, B) et au moins une chambre à gaz (G1, G2) ;
- une conduite d'aspiration du gaz (6) raccordée au dit compresseur hydraulique (C) pour l'entrée du gaz à comprimer,
- une conduite de refoulement du gaz (7) raccordée au dit compresseur hydraulique (C) pour la sortie du gaz comprimé,
- un système hydraulique (I) raccordé au dit compresseur hydraulique (C) pour actionner hydrauliquement ledit compresseur hydraulique (C) moyennant un fluide sous pression ; et
- des moyens de réglage de la pression (R) raccordés au dit système hydraulique (I) pour régler la pression du fluide alimenté dans ledit compresseur hydraulique (C),
- une vanne d'inversion (8) raccordée au dit sys-

tème hydraulique (I) ; ladite vanne d'inversion (8) comprenant un obturateur (80) qui est mobile avec mouvement alterné pour permettre un flux alterné de fluide dans le système hydraulique (I) afin de déplacer alternativement le piston (1),
- un circuit logique programmable (PLC) (9),
- un premier transducteur de pression (T1) branché électriquement au dit PLC (9) ; ledit premier transducteur de pression (T1) étant disposé dans la conduite d'aspiration du gaz (6) pour mesurer la pression d'aspiration du gaz en entrée, et
- un deuxième transducteur de pression (T2) branché électriquement au dit PLC (9) ; ledit deuxième transducteur de pression (T2) étant disposé dans la conduite de refoulement du gaz (7) pour mesurer la pression de refoulement du gaz en sortie,

où lesdits moyens de réglage de la pression (R) sont du type à commande électronique et sont électriquement branchés au dit PLC (9) ; et
ledit PLC (9) est configuré de manière à contrôler électroniquement les moyens de réglage de la pression (R) pour régler la pression du fluide à une valeur de pression calculée en fonction des valeurs de pression relevées par ledit premier transducteur de pression (T1) et par ledit deuxième transducteur de pression (T2),
caractérisé en ce que
ledit système hydraulique (I) comprend une pompe (P) actionnée par un moteur (M) ;
ledit fluide du système hydraulique (I) est de l'huile ;
ladite vanne d'inversion (8) comprend lesdits moyens de réglage de la pression (R) qui consistent en un régulateur de pression (81) connecté au dit PLC ;
ledit système (200) comprend également un troisième transducteur de pression (T3) branché électriquement au dit PLC ; ledit troisième transducteur de pression (T3) étant disposé dans la vanne d'inversion (8) pour mesurer la pression de l'huile qui est alimentée dans ladite au moins une chambre à huile ; et
ledit PLC (9) étant configuré de manière à actionner ledit obturateur (80) de la vanne d'inversion à déplacement alterné lorsque la pression de l'huile relevée par ledit troisième transducteur de pression (T3) atteint ladite valeur de pression calculée en fonction des valeurs de pression relevées par ledit premier transducteur de pression (T1) et par ledit deuxième transducteur de pression (T2).

2. Système (200) selon la revendication 1, où ledit PLC (9) comprend une table à consulter qui contient les possibles valeurs de pression d'aspiration, les possibles valeurs de pression de refoulement et les valeurs correspondantes de pression de l'huile calculées en fonction des valeurs de pression d'aspiration et de pression de refoulement.

3. Système (200) selon la revendication 2, où lesdites possibles valeurs de pression d'aspiration de la table à consulter peuvent varier de 0 à 250 Bar et lesdites possibles valeurs de pression de refoulement de la table à consulter peuvent varier de 10 bar à 250 bar.

4. Système (200) selon l'une quelconque des revendications précédentes, comprenant un pressostat (70) disposé dans ladite conduite de refoulement (7) et configuré de manière à faire passer le gaz lorsque la pression du gaz atteint la pression souhaitée de compression et ledit deuxième transducteur de pression (T2) étant embarqué dans ledit pressostat (70).

5. Système (200) selon l'une quelconque des revendications précédentes, où ledit piston (1) du compresseur hydraulique a deux poussoirs (11, 12) et une tige (10) passante à travers une cloison (20) disposée dans le cylindre (2) de manière à générer deux chambres à huile (A, B) et deux chambres à gaz (G1, G2).

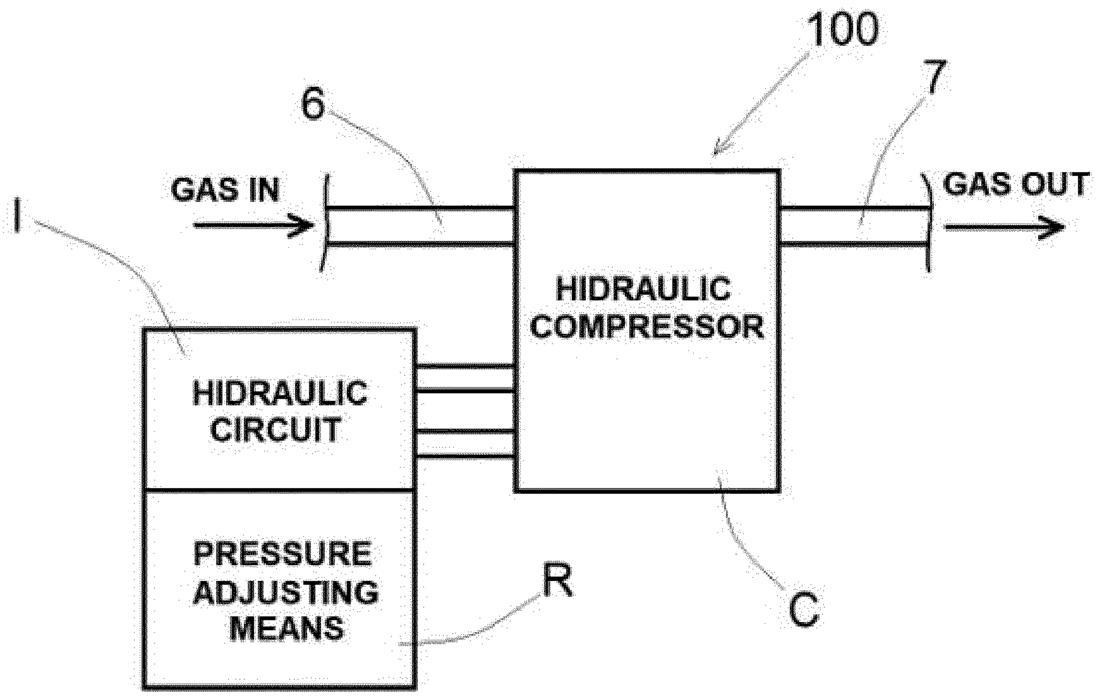

FIG. 1
PRIOR ART

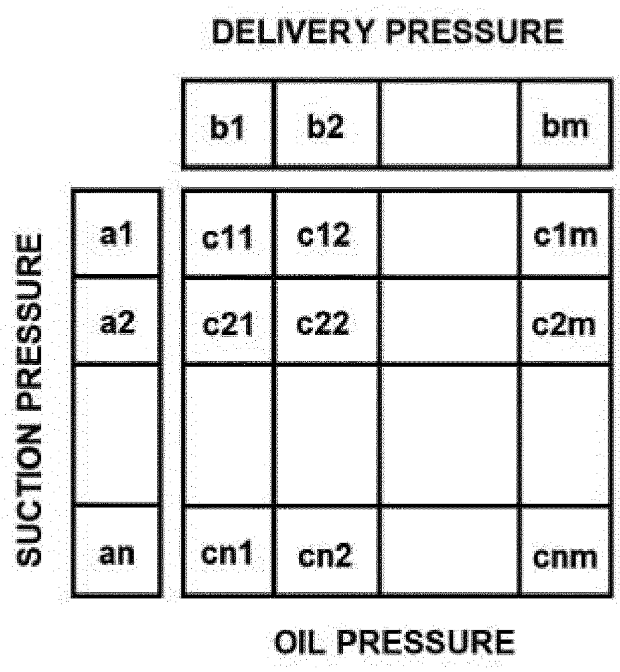

FIG. 4

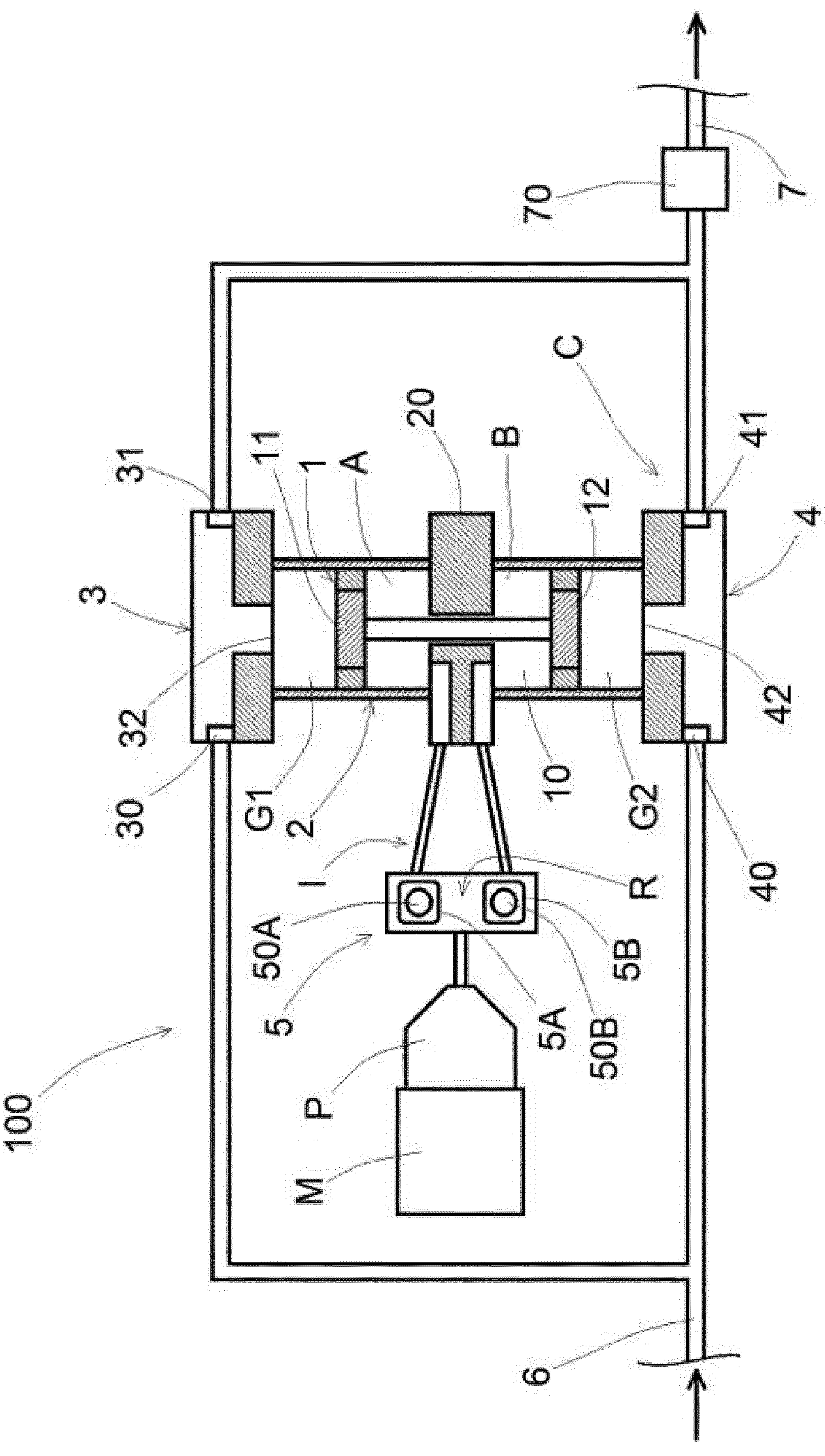

FIG. 2
PRIOR ART

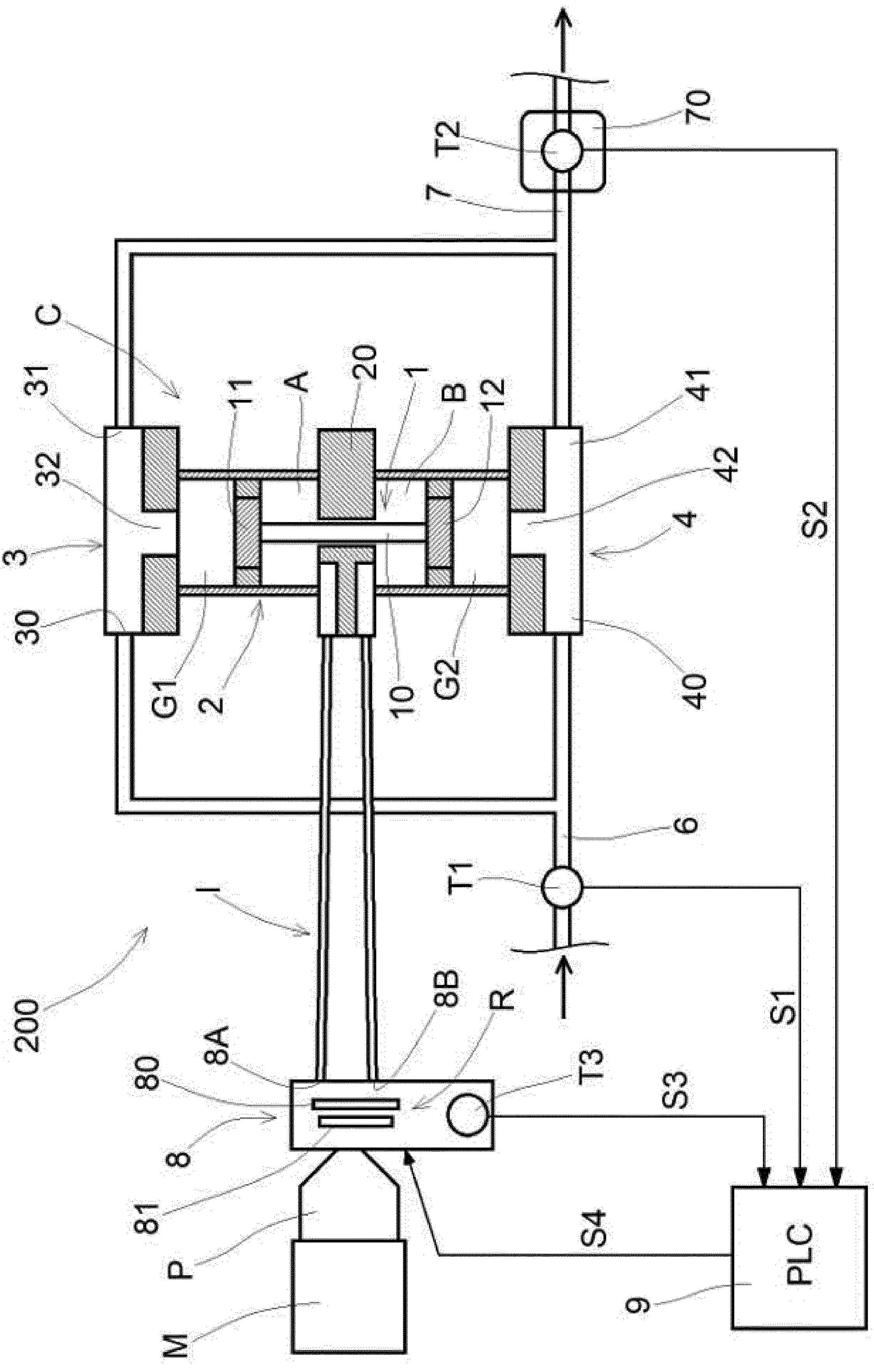
200
I
C
31
32
3
30
G1
2
11
A
20
1
B
12
10
G2
42
41
4
40
7
T2
70
6
T1
S1
S2
S3
S4
8
8A
8B
80
81
R
T3
P
M
9
PLC

FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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