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(54) **Method and system for modifying a used hydrocarbon fluid to create a cylinder oil**

Methode und System für die Modifizierung eines gebrauchten Kohlenwasserstoff-Fluids zur Herstellung eines Zylinderöls

Méthode et système permettant la modification d'un liquide hydrocarboné utilisé afin de créer une huile pour cylindre

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Description

FIELD OF THE INVENTION

[0001] The invention relates to a method of creating an all-loss lubricant. Further, the invention relates to a system for creating an all-loss lubricant.

BACKGROUND OF THE INVENTION

[0002] Two-stroke crosshead engines used in marine or stationary applications are equipped with two separate lubricating oil systems. One lubricating system comprises so-called system oil that normally is used for lubrication and cooling of the engine's bearings and e.g. oil-cooled pistons as well as for activation and/or control of various valves or the like. The other lubricating system comprises an all-loss lubricant (cylinder oil) that normally is used for lubrication of the engine's cylinders, piston rings and piston skirt.

[0003] In typical two-stroke crosshead engines, the cylinder oil is spent continuously by each turn of the engine whereas the system oil in principle is not spent (except by smaller unintentional leakages). The lubrication system comprising the cylinder oil is also often referred to as an "all-loss" lubrication system as the oil is spent. The use of and various types of both system oil(s) and cylinder oil(s) is very well known in the art.

[0004] The cylinder oil typically contains certain additives that function to reduce, minimize or neutralise the acid level of the cylinder system.

[0005] Typical cylinder oils usually have an SAE (Society of Automotive Engineering) viscosity equivalent to about 50 and normally have a total base number (TBN) of about 40 to 70 for the neutralisation of acid products produced during the combustion process. Typical system oils usually have an SAE viscosity of about 30 with a relatively low TBN content, typically below 10. These exemplary values may vary dependent on the actual application and the specific design of the systems that the oils are used in.

[0006] In recent two-stroke cross-head engine designs involving electronic and/or hydraulic control and/or activation of valves, etc., the minimum performance requirements of the system oil has been substantially increased compared to earlier design using traditional mechanical control/activation.

[0007] In four-stroke, trunk piston (diesel) engines, however, typically use only a single oil type for lubrication and cooling. Such engines are used as secondary/auxiliary or propulsion engines on ships, or in stationary power generation or liquid/gas transmission applications. Such used oils typically have a SAE viscosity of about 30 or 40. While the system oil of two-stroke cross-head engines typically remains within its specified performance limits for an extended period of time, trunk piston engine oils are constantly affected by exposure to the combustion process. However, due to the inherent de-

sign of two-stroke cross-head engines, spent cylinder lubricants invariably leaks past the piston rod stuffing box contaminating the system oil. Thus, the useful properties of both trunk piston engine and system oil degenerate over time and finally the oils will have to be either replenished or completely changed. Similarly, other lubricants used on-board vessels or at stationary sites, such as hydraulic fluids, gear oils, turbine oils, heavy duty diesel oils, system oils, trunk piston engine oils, compressor oils and the like, do deteriorate over time, due to e.g. contamination, oxidation, hydrolysis etc. and therefore have to be replenished or changed at certain intervals.

[0008] The performance level of lubricants is typically measured periodically and may not go beyond certain limits if the oiled component's condition should not be jeopardized. An important cause of performance loss is caused by particle contamination. These particles include combustion by-products and wear components, which can be partially removed by oil separators. However, in the case of two-stroke cross-head engines, one of the sources of contamination is spent cylinder oil leakage past the stuffing box causing both the viscosity and base number of the system oil to increase over time, a process that cannot be reversed by separators.

[0009] A diesel engine's frictional loss is mainly of a viscose character. An increase in the viscosity of the system oil will therefore result in a diminished efficiency, increased fuel consumption and increased emissions.

[0010] In order to manufacture cylinder oil, prior art methods and systems typically blend suited base oils and suited additives and/or an additive package to obtain a fully formulated cylinder lubricant. This is typically done at a dedicated lubricant blend plant and the resulting cylinder lubricant has to be delivered to a ship or an off-shore plant for use in engines.

[0011] Apart from the mentioned inevitable mixing of cylinder oil and system oil prior art methods and systems do not otherwise mix these types of oils. Further, some prior art methods/systems also suggest a variation in lubricant flow rate or properties in response to actual engine conditions, cf. e.g. US 6,779,505. However, such methods and systems do not address the deterioration of oils due to contamination or other processes and the potential to re-use these used oils as cylinder oil.

[0012] Patent specification US 2004/144355 discloses modification of lubricant properties in an operating all loss lubricating system based on engine conditions. The lubricant may comprise a primary lubricant and an additive that are mixed when engine conditions require it. In another aspect the lubrication is for a cross-head marine diesel engine where a primary low speed diesel engine cylinder lubricant is supplied under low wear and corrosion operating conditions and where a the primary lubricant is blended with an antiwear and anti corrosion amount of additives or mixtures under increased wear and corrosion operating conditions. The decision of whether the primary lubricant is used or if the primary lubricant and additives should be used is e.g. dependent

on certain sulfur levels is present in the combusting fuels.

[0013] Patent specification US 5 067 455 discloses supplying an additive to lubricating oil in an internal combustion engine in response to actual measured TBN of the lubricating oil or more specifically if the measured TBN is outside a predetermined interval. The TBN is to be kept between 0 and 2. The engine is a traditional combustion where additives are added to some oil in an oil pan in response to measured TBN.

[0014] Patent specification GB 1 183 345 discloses compounds useful as lubricating oil additives, a method for preparation of these and to lubricating compositions containing them. One example describes adding an over-based detergent to a marine diesel cylinder oil having a TBN of 40 so that the blend achieves a TBN value of 60, i.e. adding a detergent to a cylinder oil to increase the TBN. The usefulness of adding additives to a cylinder oil (and increasing the TBN thereby) is disclosed.

OBJECT AND SUMMARY OF THE INVENTION

[0015] It is an object of the present invention to provide a method of creating a cylinder oil (and a corresponding system) that solves the above-mentioned (and other) shortcomings of prior art. A further object is to provide this in a cost-effective and simplified way.

[0016] A further object of the present invention is to enable improved performance of non-total loss lubricants over time and thus a more efficient use of both non-total loss lubricants and cylinder oil.

[0017] These objects, among others, are achieved by a method of (and corresponding system) creating a cylinder oil for at least one two-stroke crosshead engine using an all-loss cylinder oil, the method comprising modification of at least one initial fluid by determining the TBN (s) of the at least one initial fluid, determining a desired TBN of a cylinder oil and adjusting the TBN(s) of the at least one initial fluid accordingly by blending the at least one initial fluid with suited additive(s) resulting in a created cylinder oil wherein the at least one initial fluid comprises an at least partially used oil or an at least partially used lubricant and wherein the at least one initial fluid continuously, near-continuously or intermittently tapped from an existing system and where the at least one initial fluid is replenished.

[0018] In this way, a method for modifying an initial fluid to create cylinder oil by adjusting solely TBN is obtained.

[0019] This provides significant economical benefits since lubricants that otherwise would have to be disposed of can be re-used as a total-loss cylinder lubricant. Furthermore, cylinder oil does not have to be purchased. The oil(s) used to blend the cylinder oil is/are of more consistent quality as it is replenished (contrary to the traditional practice) which reduces machinery wear, etc. Thus, the replenishment of the initial fluid(s) provides enhanced and consistent performance of the initial fluids resulting in greatly reduced component wear and equip-

ment lifecycle cost. Even further, a more environmentally friendly method/system is provided since waste, in the form of spent oil(s) that is discarded after prolonged use, is reduced as it is converted into cylinder oil.

[0020] Preferably, at least one of the initial fluids are at least partially used oil(s). Hereby, a fully formulated cylinder lubricant is obtained by modifying TBN of this used initial fluid(s).

[0021] In a preferred embodiment, the suited additive (s) comprise at least one base.

[0022] In a further preferred embodiment, the at least one base comprises

1. basic salts of alkaline or earth alkaline elements, and/or
2. detergents and/or
3. dispersants.

[0023] The alkaline / earth alkaline elements may be e.g. K, Na, Ca, Ba, Mg or the like. The basic salts may belong to the inorganic chemical families of e.g. oxides, hydroxides, carbonates, sulfates or the like. The detergents may belong to the organic chemical families of e.g. sulfonates, salicylates, phenates, sulfophenates, Mannich-bases and the like. The dispersants may belong to the organic chemical families of succinimides or the like.

[0024] In a preferred embodiment, the cylinder oil is used in reciprocating internal combustion engines used in marine or stationary applications.

[0025] In yet another embodiment, the reciprocating internal combustion engines are two-stroke crosshead engines.

[0026] Preferably, the method and embodiments thereof according to the present invention is used offshore, on-site or in a land based plant.

[0027] Preferably, the cylinder oil is created with a TBN in response to fuel oil characteristics and/or actual engine operating requirements.

[0028] In another preferred embodiment, the TBN of the cylinder oil is chosen based upon sulphur-content of the fuel oil.

[0029] Preferably, the initial fluid is a hydrocarbon fluid. In one embodiment, the hydrocarbon fluid is a lubricant.

[0030] In a preferred embodiment, the lubricant is a used lubricant, i.e. a lubricant that has at least been partially used elsewhere.

[0031] Preferably, the used lubricant is selected from a group of lubricants, such as hydraulic fluids, gear oils, system oils, trunk piston engine oils, turbine oils, heavy duty diesel oils, compressor oils and the like.

[0032] In another embodiment, the method further comprises the step of using suited instrumentation in order to control the quality of the finished lubricant.

[0033] The present invention also relates to a system corresponding to and having the same advantages as the method of the present invention. More specifically, the present invention also relates to a system for providing a cylinder oil to at least one two-stroke crosshead

engine using an all-loss cylinder oil, the system comprising: at least one two-stroke crosshead engine using an all-loss cylinder oil, and an apparatus adapted to modify at least one initial fluid by determining the TBN(s) of the at least one initial fluid, determine a desired TBN of a cylinder oil and adjust the TBN(s) of the at least one initial fluid accordingly by blending the at least one initial fluid with suited additive(s) resulting in a created cylinder oil wherein the of least one initial fluid comprises an at least partially used oil or an at least partially used lubricant and wherein the system is further adapted to continuously, near-continuously or intermittently tap the at least one initial fluid from an existing system and adapted to replenish the at least one initial fluid and adapted to provide the created cylinder oil to said at least one two-stroke crosshead engine.

[0034] Advantageous embodiments of the system according to the present invention are defined in the sub-claims and described in detail in the following. The embodiments of the system correspond to the embodiments of the method and have the same advantages for the same reasons.

BRIEF DESCRIPTION OF THE DRAWINGS

[0035] These and other aspects of the invention will be apparent from and elucidated with reference to the illustrative embodiments shown in the drawing, in which:

[0036] Figure 1 shows a schematic block diagram of one embodiment according to the present invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0037] Figure 1 shows a schematic block diagram of one embodiment according to the present invention. Shown are an all-loss cylinder lubricant supply comprising cylinder oil (102), base additive(s) (103) and a system oil loop comprising at least one initial fluid (101). Further shown is a two-stroke crosshead engine (100), a waste tank (106), a fresh system oil tank (105), a separator (107) and a blending apparatus (104) for carrying out the present invention.

[0038] According to the present invention the cylinder oil is created by modification of at least one initial fluid (101) by determining the TBN(s) of the at least one initial fluid, determining a desired TBN of a cylinder oil (102) and adjusting the TBN(s) of the at least one initial fluid (101) accordingly by blending the at least one initial fluid (101) with suited additive(s) (103). This is preferably done by the blending apparatus (104). Preferably, the at least one initial fluid are at least partially used oil(s). Hereby, a fully formulated cylinder lubricant is obtained by modifying TBN of spent oil.

[0039] Adjusting the TBN preferably comprises adjusting at least one additive level or adding one or more additives, where the additives comprise at least one base comprising basic salts of alkaline or earth alkaline elements, and/or detergents and/or dispersants.

[0040] The alkaline / earth alkaline elements may be e.g. K, Na, Ca, Ba, Mg or the like. The basic salts may belong to the inorganic chemical families of e.g. oxides, hydroxides, carbonates, sulfates or the like. The detergents may belong to the organic chemical families of e.g. sulfonates, salicylates, phenates, sulfophenates, Mannich-bases and the like. The dispersants may belong to the organic chemical families of succinimides or the like.

[0041] As mentioned, the cylinder oil may be used in reciprocating internal combustion engines (e.g. two-stroke crosshead engines) used in marine or stationary applications. The creation of a cylinder oil is due to its simplicity and the normal availability of the required initial fluid and the additives very suitable for offshore or on-site applications.

[0042] The creation of the cylinder oil may also take additional aspects into consideration such as actual engine requirements and sulphur content of the fuel.

[0043] The used initial fluid may e.g. be hydraulic fluids, gear oils, system oils, trunk piston engine oils, turbine oils, heavy duty diesel oils, compressor oils and the like.

[0044] Preferably, the initial fluid is system oil and the total-loss lubricant is cylinder oil.

[0045] In one embodiment, the created cylinder oil is based on two-stroke engine system oil that continuously, near-continuously or intermittently is tapped from an existing system and where the system oil is replenished.

[0046] Alternatively, the created cylinder oil is based on a mixture of oils that continuously, near-continuously or intermittently are tapped from an existing system and where the oils are replenished.

[0047] A significant advantage of the present invention is that the main engine(s) only has to be supplied with fully-formulated, fresh system oil. The system oil is then used for its traditional purpose and some of the system oil is blended with additives adjusting the TBN making it suitable for cylinder oil according to the present invention. This increases the availability of the needed oil geographically and increases competition between supplies of oil since all presently known two-stroke system oils are usable as initial oil for the cylinder oil by using the present invention. Further, since, where applicable, other initial fluids, such as but not limited to used hydraulic, gear, trunk piston engine or compressor oils may be included in the process of creating cylinder oil procurement cost will be considerably reduced.

[0048] Further, since some of initial fluids are now reused in the manufacture of cylinder oil (as opposed to their traditional use) they will have to be replenished whereby the problem of gradual deterioration is minimised or avoided.

[0049] In a preferred embodiment, a continuous, near-continuous or intermittently tapping of the system oil from a two-stroke main engine and/or any other suited initial fluid is proposed to use these initial fluids as a basis for the creation of cylinder oil according to the present invention.

[0050] The additive(s) or additive package used by the

modifier may serve several purposes but will normally always be used for adjusting the oils TBN. The process may also be used to provide flexible TBN levels as required by the actual fuel oil properties and engine operating parameters.

[0051] The creation of cylinder oil/cylinder oil according to the present invention is due to its simplicity very well suited for on-site creation, e.g. aboard a ship / vessel, off-shore equipment, stationary plants, etc.

[0052] In the claims, any reference signs placed between parentheses shall not be constructed as limiting the claim. The word "comprising" does not exclude the presence of elements or steps other than those listed in a claim. The word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements.

Claims

1. A method of creating a cylinder oil for at least one two-stroke crosshead engine using an all-loss cylinder oil, the method comprising modification of at least one initial fluid (101) by determining the TBN(s) of the at least one initial fluid, determining a desired TBN of a cylinder oil (102) and adjusting the TBN(s) of the at least one initial fluid (101) accordingly by blending the at least one initial fluid (101) with suited additive(s) (103) resulting in a created cylinder oil wherein the at least one initial fluid (101) comprises an at least partially used oil or an at least partially used lubricant and wherein the at least one initial fluid (101) is continuously, near-continuously or intermittently tapped from an existing system and wherein the at least one initial fluid (101) is replenished.
2. A method according to claim 1, wherein the suited additive(s) comprise at least one base.
3. A method according to claim 2, wherein the at least one base comprises
 - basic salts of alkaline or earth alkaline elements, and/or
 - detergents and/or
 - dispersants.
4. A method according to claims 1 - 3, wherein the cylinder oil is used in reciprocating internal combustion engines used in marine or stationary applications.
5. A method according to claim 4, wherein said reciprocating internal combustion engines are two-stroke crosshead engines.
6. A method according to claims 1 - 5, wherein the method is used offshore, on-site or in a land based plant.
7. A method according to claims 1 - 6, wherein the cylinder oil is created with a TBN in response to fuel oil characteristics and/or actual engine operating requirements.
8. A method according to claims 1 - 7, wherein the TBN of the cylinder oil is chosen based upon sulphur-content of the fuel oil.
9. A method according to claims 1 - 8, wherein said initial fluid is a hydrocarbon fluid.
10. A method according to claim 9, wherein said hydrocarbon fluid is a lubricant.
11. A method according to claim 10, wherein the at least one initial fluid is selected from a group of hydraulic fluids, gear oils, system oils, trunk piston engine oils, turbine oils, heavy duty diesel oils, and compressor oils.
12. A method according to claims 1 - 11, wherein the method further comprises the step of: using suited instrumentation in order to control the quality of the finished lubricant.
13. A system for providing a cylinder oil to at least one two-stroke crosshead engine using an all-loss cylinder oil, the system comprising: at least one two-stroke crosshead engine using an all-loss cylinder oil, and an apparatus (104) adapted to modify at least one initial fluid (101) by determining the TBN(s) of the at least one initial fluid, determine a desired TBN of a cylinder oil (102) and adjust the TBN(s) of the at least one initial fluid (101) accordingly by blending the at least one initial fluid (101) with suited additive (s) (103) resulting in a created cylinder oil wherein the at least one initial fluid (101) comprises an at least partially used oil or an at least partially used lubricant and wherein the system is further adapted to continuously, near-continuously or intermittently tap the at least one initial fluid (101) from an existing system and adapted to replenish the at least one initial fluid (101) and adapted to provide the created cylinder oil to said at least one two-stroke crosshead engine.
14. A system according to claim 13, wherein the suited additive(s) comprise at least one base.
15. A system according to claim 14, wherein the at least one base comprises
 - basic salts of alkaline or earth alkaline elements, and/or
 - detergents and/or
 - dispersants.

16. A system according to claims 13 - 15, wherein said two-stroke crosshead engine is a reciprocating internal combustion engine used in marine or stationary applications.
17. A system according to claims 13 - 16, wherein the system is located offshore, on-site or in a land based plant.
18. A system according to claims 13 - 17, wherein the apparatus is adapted to adjust the TBN(s) of the at least one initial fluid (101) in response to fuel oil characteristics and/or actual engine operating requirements.
19. A system according to claims 13 - 18, wherein the apparatus is adapted to determine a desired TBN of a cylinder oil (102) in response to a sulphur-content of the fuel oil.
20. A system according to claims 13 - 19, wherein said initial fluid is a hydrocarbon fluid.
21. A system according to claim 20, wherein said hydrocarbon fluid is a lubricant.
22. A system according to claim 13, wherein the at least one initial fluid is selected from a group of hydraulic fluids, gear oils, system oils, trunk piston engine oils, turbine oils, heavy duty diesel oils, and compressor oils.
23. A system according to claims 13 - 22, wherein the system further comprises suited instrumentation for controlling the quality of the created lubricant.

Patentansprüche

1. Verfahren zur Erzeugung eines Zylinderöls für mindestens einen Zweitakt-Kreuzkopfmotor unter Verwendung eines All-loss- bzw. Gesamtverlust-Zylinderöls, wobei das Verfahren die Modifizierung von mindestens einem Anfangsfluid (101) durch die Bestimmung der TBN(s) bzw. der Gesamtbasenzahl (en) des mindestens einen Anfangsfluids, die Bestimmung einer gewünschten TBN eines Zylinderöls (102) und das entsprechende Einstellen der TBN(s) von dem mindestens einen Anfangsfluid (101) durch Vermischen des mindestens einen Anfangsfluids (101) mit (einem) geeigneten Additiv(en) (103) umfasst, wobei ein erzeugtes Zylinderöl erhalten wird, wobei das mindestens eine Anfangsfluid (101) ein zumindest teilweise verbrauchtes Öl oder ein zumindest teilweise verbrauchtes Schmiermittel umfasst, und wobei das mindestens eine Anfangsfluid (101) kontinuierlich, nahezu kontinuierlich oder mit Unterbrechungen von einem bestehenden System abge-

zapft wird, und wobei das mindestens eine Fluid (101) wieder aufgefüllt wird.

2. Verfahren gemäß Anspruch 1, wobei das bzw. die geeignete(n) Additiv(e) mindestens eine Base umfasst bzw. umfassen.
3. Verfahren gemäß Anspruch 2, wobei die mindestens eine Base folgendes umfasst
- basische Salze von Alkali- oder Erdalkaliele-
menten und/oder
 - Detergentien und/oder
 - Dispergiermittel.
4. Verfahren gemäß den Ansprüchen 1 - 3, wobei das Zylinderöl in Kolbenmotoren mit innerer Verbrennung, die in marinen oder stationären Anwendungen zum Einsatz kommen, verwendet wird.
5. Verfahren gemäß Anspruch 4, wobei die Kolbenmotoren mit innerer Verbrennung Zweitakt-Kreuzkopfmotoren sind.
6. Verfahren gemäß den Ansprüchen 1 - 5, wobei das Verfahren im Meer bzw. Offshore, vor Ort oder in einer landgestützten Anlage zur Anwendung kommt.
7. Verfahren gemäß den Ansprüchen 1 - 6, wobei das Zylinderöl mit einer TBN in Bezug auf die Brennölcharakteristika und/oder die vorliegenden Motorbetriebsanfordernisse erzeugt wird.
8. Verfahren gemäß den Ansprüchen 1 - 7, wobei die TBN von dem Zylinderöl basierend auf dem Schwefelgehalt des Brennöls gewählt wird.
9. Verfahren gemäß den Ansprüchen 1 - 8, wobei das Anfangsfluid ein Kohlenwasserstofffluid ist.
10. Verfahren gemäß Anspruch 9, wobei das Kohlenwasserstofffluid ein Schmiermittel ist.
11. Verfahren gemäß Anspruch 10, wobei das mindestens eine Anfangsfluid aus der Gruppe von Hydraulikfluiden, Getriebeölen, Systemölen, Tauchkolben-Motorölen, Turbinenölen, Hochleistungs-Dieselölen und Kompressorölen gewählt wird.
12. Verfahren gemäß den Ansprüchen 1 - 11, wobei das Verfahren ferner den folgenden Schritt umfasst: Verwenden einer geeigneten Instrumentierung, um die Qualität des fertigen Schmiermittels zu kontrollieren.
13. System zur Bereitstellung eines Zylinderöls für mindestens einen Zweitakt-Kreuzkopfmotor unter Verwendung eines Gesamtverlust-Zylinderöls, wobei das System folgendes umfasst: mindestens einen

- Zweitakt-Kreuzkopfmotor unter Verwendung eines Gesamtverlust-Zylinderöls und eine Vorrichtung (104), die dafür ausgelegt ist, mindestens ein Anfangsfluid (101) durch Bestimmen der TBN(s) des mindestens einen Anfangsfluids zu modifizieren, eine gewünschte TBN eines Zylinderöls (102) zu bestimmen und die TBN(s) von dem mindestens einen Anfangsfluid (101) durch Vermischen des mindestens einen Anfangsfluids (101) mit (einem) geeigneten Additiv(en) (103) einzustellen, wobei ein erzeugtes Zylinderöl erhalten wird, wobei das mindestens eine Anfangsfluid (101) ein zumindest teilweise verbrauchtes Öl oder ein zumindest teilweise verbrauchtes Schmiermittel umfasst, und wobei das System ferner so ausgelegt ist, um das mindestens eine Anfangsfluid (101) kontinuierlich, nahezu kontinuierlich oder mit Unterbrechungen von einem bestehenden System abzuzapfen, und so ausgelegt ist, um das mindestens eine Fluid (101) wieder aufzufüllen, und so ausgelegt ist, um das erzeugte Zylinderöl dem mindestens einen Zweitakt-Kreuzkopfmotor zuzuführen.
14. System gemäß Anspruch 13, wobei das bzw. die geeignete(n) Additiv(e) mindestens eine Base umfasst bzw. umfassen.
15. System gemäß Anspruch 14, wobei die mindestens eine Base folgendes umfasst
- basische Salze von Alkali- oder Erdalkalielementen und/oder
 - Detergentien und/oder
 - Dispergiermittel.
16. System gemäß den Ansprüchen 13 - 15, wobei der Zweitakt-Kreuzkopfmotor ein Kolbenmotor mit innerer Verbrennung ist, der in marinen oder stationären Anwendungen zum Einsatz kommt.
17. System gemäß den Ansprüchen 13 - 16, wobei das System im Meer, vor Ort oder in einer landgestützten Anlage zur Anwendung kommt.
18. System gemäß den Ansprüchen 13 - 17, wobei die Vorrichtung so ausgelegt ist, um die TBN(s) des mindestens einen Anfangsfluids (101) in Bezug auf die Brennölcharakteristika und/oder die vorliegenden Motorbetriebsanfordernisse einzustellen.
19. System gemäß den Ansprüchen 13 - 18, wobei die Vorrichtung so ausgelegt ist, um eine gewünschte TBN von einem Zylinderöl (102) in Bezug auf den Schwefelgehalt des Brennöls zu bestimmen.
20. System gemäß den Ansprüchen 13 - 19, wobei das Anfangsfluid ein Kohlenwasserstofffluid ist.
21. System gemäß Anspruch 20, wobei das Kohlenwasserstofffluid ein Schmiermittel ist.
22. System gemäß Anspruch 13, wobei das mindestens eine Anfangsfluid aus der Gruppe von Hydraulikfluiden, Getriebeölen, Systemölen, Tauchkolben-Motörölen, Turbinenölen, Hochleistungs-Dieselölen und Kompressorölen gewählt wird.
23. System gemäß den Ansprüchen 13 - 22, wobei das System ferner eine geeignete Instrumentierung zur Kontrolle der Qualität des erzeugten Schmiermittels umfasst.

Revendications

1. Procédé permettant de créer une huile pour cylindre pour au moins un moteur deux temps à crosse utilisant une huile pour cylindre tous risques, le procédé comprenant la modification d'au moins un fluide initial (101) en déterminant le(s) TBN(s) du ou des fluides initiaux, en déterminant un TBN souhaité d'une huile pour cylindre (102) et en ajustant en conséquence le(s) TBN(s) du ou des fluides initiaux (101) en mélangeant le ou les fluides initiaux (101) avec un (des) additif(s) approprié(s) (103) pour aboutir à une huile pour cylindre créée, dans lequel le ou les fluides initiaux (101) comprennent une huile au moins partiellement usée ou un lubrifiant au moins partiellement usé et dans lequel le ou les fluides initiaux (101) sont piqués sur un système existant en continu, presque en continu ou par intermittence et dans lequel le ou les fluides initiaux (101) sont remis à niveau.
2. Procédé selon la revendication 1, dans lequel le (les) additif(s) approprié(s) comprennent au moins une base.
3. Procédé selon la revendication 2, dans lequel la ou les bases comprennent
 - des sels basiques d'éléments alcalins ou alcalino-terreux, et/ou
 - des détergents et/ou
 - des dispersants.
4. Procédé selon les revendications 1 - 3, dans lequel l'huile pour cylindre est utilisée dans des moteurs alternatifs à combustion interne utilisés dans des applications marines ou fixes.
5. Procédé selon la revendication 4, dans lequel lesdits moteurs alternatifs à combustion interne sont des moteurs deux temps à crosse.
6. Procédé selon les revendications 1 - 5, dans lequel

- le procédé est utilisé en offshore, sur site ou dans une usine à terre.
7. Procédé selon les revendications 1 - 6, dans lequel l'huile pour cylindre est créée avec un TBN en réponse aux caractéristiques d'un fuel-oil et/ou aux conditions d'exploitation réelles d'un moteur. 5
8. Procédé selon les revendications 1 - 7, dans lequel le TBN de l'huile pour cylindre est choisi en fonction de la teneur en soufre du fuel-oil. 10
9. Procédé selon les revendications 1 - 8, dans lequel ledit fluide initial est un fluide hydrocarboné. 15
10. Procédé selon la revendication 9, dans lequel ledit fluide hydrocarboné est un lubrifiant. 20
11. Procédé selon la revendication 10, dans lequel le ou les fluides initiaux sont choisis dans le groupe des fluides hydrauliques, des huiles pour engrenages, des huiles pour systèmes, des huiles pour moteurs à piston fourreau, des huiles pour turbines, des huiles diesel de haute tenue et des huiles pour compresseurs. 25
12. Procédé selon les revendications 1 - 11, dans lequel le procédé comprend en outre l'étape consistant à utiliser une instrumentation adéquate afin de contrôler la qualité du lubrifiant fini. 30
13. Système permettant d'amener une huile pour cylindre à au moins un moteur deux temps à crosse utilisant une huile pour cylindre tous risques, le système comprenant: au moins un moteur deux temps à crosse utilisant une huile pour cylindre tous risques et un appareil (104) conçu pour modifier au moins un fluide initial (101) en déterminant le(s) TBN(s) du ou des fluides initiaux, déterminer un TBN souhaité d'une huile pour cylindre (102) et ajuster en conséquence le(s) TBN(s) du ou des fluides initiaux (101) en mélangeant le ou les fluides initiaux (101) avec un (des) additif(s) approprié(s) (103) pour aboutir à une huile pour cylindre créée, dans lequel le ou les fluides initiaux (101) comprennent une huile au moins partiellement usée ou un lubrifiant au moins partiellement usé et dans lequel le système est conçu en outre pour piquer sur un système existant, en continu, presque en continu ou par intermittence, le ou les fluides initiaux (101) et conçu pour remettre à niveau le ou les fluides initiaux (101), et conçu pour amener l'huile pour cylindre créée audit au moins un moteur deux temps à crosse. 35 40 45 50
14. Système selon la revendication 13, dans lequel le (les) additif(s) approprié(s) comprennent au moins une base. 55
15. Système selon la revendication 14, dans lequel la ou les bases comprennent
- des sels basiques d'éléments alcalins ou alcalino-terreux, et/ou
 - des détergents et/ou
 - des dispersants.
16. Système selon les revendications 13 - 15, dans lequel ledit moteur deux temps à crosse est un moteur alternatif à combustion interne utilisé dans des applications marines ou fixes.
17. Système selon les revendications 13 - 16, dans lequel le système est situé offshore, sur site ou dans une usine à terre.
18. Système selon les revendications 13 - 17, dans lequel l'appareil est conçu pour ajuster le(s) TBN(s) du ou des fluides initiaux (101) en réponse aux caractéristiques d'un fuel-oil et/ou aux conditions d'exploitation réelles d'un moteur.
19. Système selon les revendications 13 - 18, dans lequel l'appareil est conçu pour déterminer un TBN souhaité d'une huile pour cylindre (102) en réponse à une teneur en soufre du fuel-oil.
20. Système selon les revendications 13 - 19, dans lequel ledit fluide initial est un fluide hydrocarboné.
21. Système selon la revendication 20, dans lequel ledit fluide hydrocarboné est un lubrifiant.
22. Système selon la revendication 13, dans lequel le ou les fluides initiaux sont choisis dans le groupe des fluides hydrauliques, des huiles pour engrenages, des huiles pour systèmes, des huiles pour moteurs à piston fourreau, des huiles pour turbines, des huiles diesel de haute tenue et des huiles pour compresseurs.
23. Système selon les revendications 13 - 22, dans lequel le système comprend en outre une instrumentation adéquate pour contrôler la qualité du lubrifiant créé.

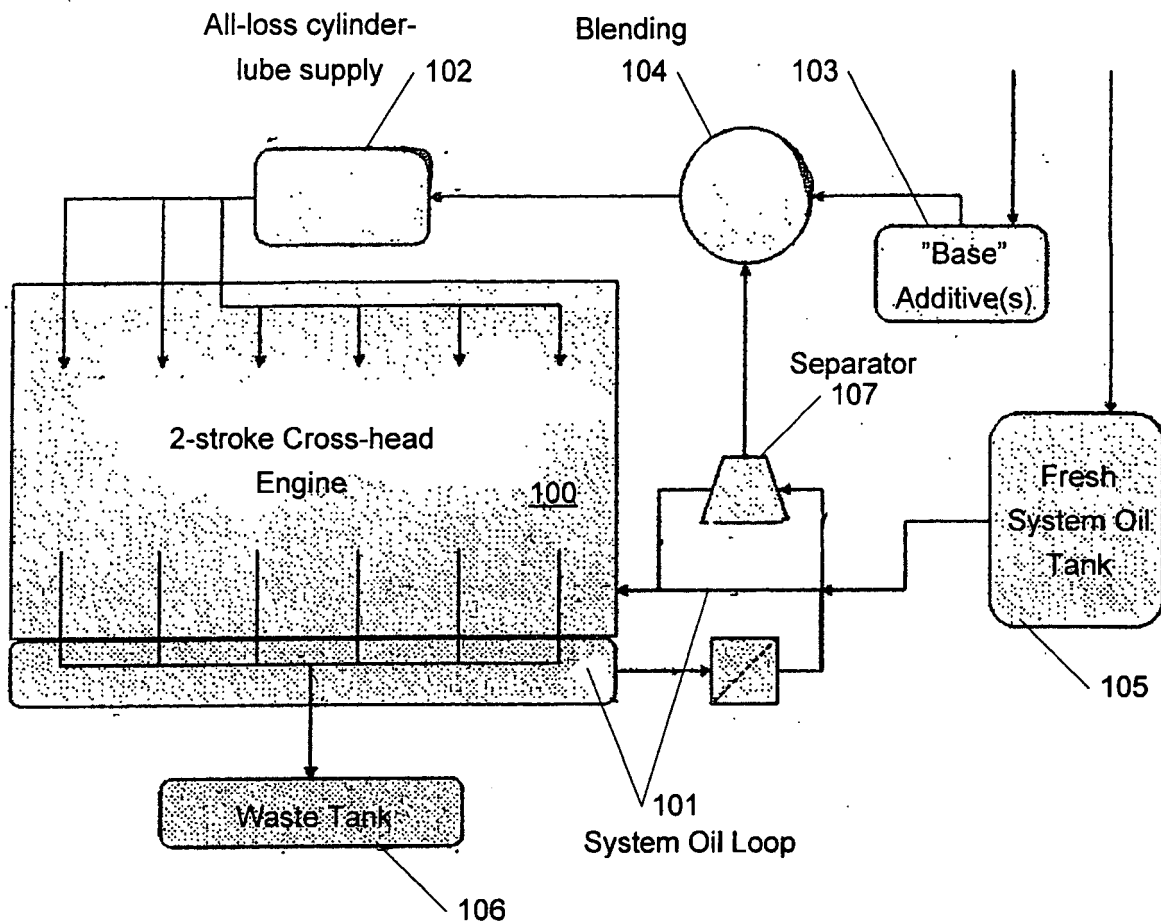


Figure 1

REFERENCES CITED IN THE DESCRIPTION

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