

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **79102515.8**

(51) Int. Cl.³: **C 10 M 3/02**
C 23 F 11/10

(22) Date of filing: **18.07.79**

(30) Priority: **29.07.78 DE 2833473**

(43) Date of publication of application:
06.02.80 Bulletin 80/3

(64) Designated Contracting States:
BE FR GB IT LU NL SE

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(54) **Aqueous hydraulic liquid and concentrates thereof having improved corrosion-protective properties for metals.**

(57) The present invention is related to the decrease of corrosion of metallic surfaces by aqueous hydraulic liquids contacting the same and corrosion inhibiting additives for such aqueous hydraulic liquids. More in particular, the present invention is related to aqueous hydraulic liquid concentrates comprising a mixture of particular additives which concentrates can be diluted with water to yield the aqueous hydraulic liquids with improved anti-corrosion properties.

EP 0 007 567 A1

TITLE MODIFIED
see front page

AQUEOUS HYDRAULIC LIQUID WITH IMPROVED CORROSION PROTECTION
PROPERTIES TO METALS

BACKGROUND OF THE INVENTION

The present invention is related to the decrease of corrosion of metallic surfaces by aqueous hydraulic liquids contacting the same and corrosion inhibiting additives for such aqueous hydraulic liquids. More in particular, the present invention is related to aqueous hydraulic liquid concentrates which can be diluted with water to yield the aqueous hydraulic liquids with improved anti-corrosion properties.

In many technical areas the transfer and maintenance of pressure is effected by means of aqueous hydraulic liquids containing certain additives to prevent corrosion of the metallic containers, pistons, and connecting tubes by the water of the hydraulic liquids and in particular various mineral salts contained in many natural spring waters used for such aqueous hydraulic liquids. For instance, such aqueous hydraulic liquids are used to a great extent and volume in hydraulic pit prop by-pass systems in underground mining. In such systems the corrosion problem is particular serious because the water which is available for such hydraulic systems quite often has a high hardness caused by a high concentration of mineral salts therein. As is well known, such spring waters may have a hardness well above 25^odH, for instance up to 80^odH while normal spring water is characterized by a hardness of 20^odH.

Up to now there are two kinds of anti-corrosion additives which are added to the spring water in order to allow its use as aqueous hydraulic liquids in underground mining. The one kind consists of about 80 % of mineral oil and 20 % of one or
5 several emulgators, netting agents, corrosion resistance additives and biocides. Such corrosion resistance additives useful for this particular field of application are described for instance in German patent specification 1 259 175.

Such additive mixtures are used to a very great extent. They
10 are added in amounts of about 1 % to the water used as hydraulic liquid. Thus, dilute aqueous emulsions are obtained. As all emulsion products they have the disadvantage that they are not stable to changes in temperatures and, in particular, are stable only in rather soft water with hardness values of up to
15 25°dH. Therefore, water to be used in combination with such additives has to be demineralized and thereby softened in order to allow the production of aqueous hydraulic liquids providing sufficient corrosion protection. This of course considerably increases the costs for the preparation of such hydraulic
20 liquids. Furthermore, emulsions are known to be sensible to changes in the water hardness. Finally, such emulsions are readily subject to the noxious growth of bacteria. Since the concentration range with such corrosion protective additives based on mineral oil is very narrow for the hydraulic liquids to
25 be produced, the hydraulic liquids cannot readily be prepared at the place of use. If the additive is added to the water at too high a concentration, the formation of a homogenous emulsion is rendered impossible. This again may cause a

considerable decrease in the anti-corrosion properties and may cause the danger of a clogging of reflux filters in the hydraulic pit prop by-pass system. In addition, environmental protection reasons recently have caused studies for corrosion inhibitors which are free of mineral oils (see for instance 5 Seifen-Öle-Fette-Wachse, vol. 102 (1976) p. 159 ff.).

The other kind of corrosion protection additives to water to be used for the particular purposes given hereinabove, which are free of mineral oils consists of concentrated aqueous solutions of alkali metal or amine salts of alkyl and/or aryl 10 sulfonamido carboxylic acids (see for instance German Auslegeschrift 1 081 737, German Offenlegungsschrift 1 771 548, German Auslegeschrift 1 101 902). Other aqueous hydraulic liquids free of mineral oil contain salts of fatty acids having 7 to 21, in 15 particular 7 to 18 carbon atoms, or of alkyl aryl monophosphoric acid esters or such diphosphoric acid esters, in particular salts of mono-, di- or trihydroxy lower-alkyl amines such as triethanol amine, or of hydrazine. However, such additives have the disadvantage that they have to be added to the water 20 in quite large amounts above 3 % by weight of the water in order to give to the hydraulic liquid a sufficient corrosion protection activity and in order to fulfill the high standards of the Technical Surveillance Clubs (Technischer Überwachungsverein) for their recommendation for the purposes here described. 25 However, even at such a high concentration they do not give a sufficient corrosion protection in water with a high hardness. Still furthermore, such hydraulic liquids have to provide a sufficient lubrication in order to keep the wear

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of the hydraulically operated mine pistil as low as possible.

Many experiments have been made in order to produce aqueous hydraulic liquids which are less affected by elevated water hardness, by changes in the water hardness or changes in the concentration when added to the spring water used as basic hydraulic liquid, and which give a sufficient and high corrosion protection against water with elevated hardness even at low concentrations and where the wear of the pistons of the hydraulic system is much less in comparison to aqueous hydraulic liquids known up to now.

Accordingly, it is an object of the present invention to provide an aqueous liquid containing certain additives, i.e. to provide an aqueous hydraulic liquid concentrate which liquid upon dilution with water to the appropriately low concentration yields into an aqueous hydraulic liquid with improved anti-corrosion properties even at low concentrations of the additives.

It is furthermore an object to provide such an aqueous hydraulic liquid concentrate which can be readily diluted with water having an unusually high hardness and with water having a varying hardness.

It finally is an object to provide aqueous hydraulic liquids with improved anti-corrosion properties containing such concentrates.

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SUMMARY OF THE INVENTION

These and other objects are accomplished by the present invention. It provides an aqueous hydraulic liquid concentrate which upon dilution with water results in a hydraulic liquid with substantially decreased corrosion of the metallic containers and tubes and other apparatus of the hydraulic system even at an extremely high water hardness and even if the total of components are present in the hydraulic system in amounts so low as 0.5 to 1.5 % by weight of the water. The aqueous hydraulic liquid concentrates according to the present invention comprise, in addition to water,

- a) more than 50 % by weight of a corrosion resistance agent for metals (i.e. a compound preventing the corrosion of metals) insensible against water hardness or a mixture of several such corrosion resistance agents, possibly in admixture with another corrosion resistance agent for metals,
- c) 0.1 to 6 % by weight of a natural or synthetic oil which is substantially insoluble in water and which may be emulgated in water, or a mixture of several such oils, and
- b) a surface active agent or a mixture of such surface active agents in an amount such that the total weight of a), b) and c) is 100 %, in particular, in a molar ratio of a):b):c) corresponding to (10 to 500) : (3 to 75) : 1 and preferably corresponding to (10 to 60) : (3 to 20) : 1.

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Referring to the total weight of the active components, the mixture of active components preferably consists of 55 to 90 % by weight of the corrosion resistance agent or agents, 7 to 40 % by weight of surface active agent or agents and 0.1 to 5 % by weight of natural or synthetic oil or mixture of oils.

The concentration of the groups a), b) and c) of active agents in the concentrate is not important since the concentrate is diluted with water to an aqueous concentrate as marketed which concentrate is further diluted with water to yield the final hydraulic liquid. However, the weight ratio of the components is important. The weight ratio ranges for the various components is rather broad because members of one or another group of active components can be used which, as is known, may exert, for instance, a corrosion protective activity and surface activity (such as the salts of fatty acids or certain phosphoric acid ester). Or a compound may be used which is such a synthetic oil and at the same time shows a corrosion protective activity (such as, for instance, the chloroparaffines). Thus, there are additive components in the concentrate according to the present invention which show an activity as member of one or several component groups and, therefore, may be enumerated with its activity in the one or the other group of active components.

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DETAILED DESCRIPTION

Improved properties over prior art it is surprising that even at a water hardness of 65°dH or in excess thereof, the total amount of active components a), b) and c) in the hydraulic liquid according to the present invention may be so low as 1 % by weight. The resulting hydraulic liquid still avoids substantially completely the corrosion of the stainless steel surfaces of the cylinders and pistons or conduits and tubes of the hydraulic by-pass system and furthermore shows very substantially increased lubricating properties. While in the standard test according to the "5th Luxembourg Report about the Prerequisites and Tests of Liquids of Low Inflammability for the Hydraulic Power Transfer and Control" dated November 15, 1974 of the Expert Committee of the Commission of the European Community for the Safe Operation and Health Protection in the Coal Mining Industry, a known traded aqueous hydraulic liquid free of mineral oil and containing the triethanol amine salt of an aryl sulfonamido carboxylic acid at a concentration of 1 % shows a corrosion protection value of +148 mg (requested minimum value not more than +5 mg), an aqueous hydraulic liquid of equal concentration containing the combination of active components according to the present invention and containing the same amount of the same salt of the aryl sulfonamido carboxylic acid shows a corrosion protection of less than +1 mg, i.e. no corrosion was detectable at all. Even at a concentration of 0.5 % by weight this hydraulic liquid according to the present invention still showed a corrosion protection value of +12 mg.

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Water hardness °dH	Total weight % of components in the final hydraulic liquid prior art product	Change of weight of components in product according to invention	Change of weight of tested material in mg stainless steel	cadmium pure	zinc pure
20	1	-	+ 83	+ 32	+ 55
20	-	1	+ 1	+ 1	+ 1
20	2	-	+ 17	+ 2	+ 2
20	-	0.5	+ 1	+ 1	+ 1
65	2	-	+ 134	+ 14	+ 3
65	1	-	+ 148	-	+ 15
65	-	1	+ 1	-	+ 3
65	-	0.5	+ 12	-	+ 1
80	-	0.5	+ 2	-	-
80	-	0.5	+ 8	-	-

The improvement of the lubricating properties of the aqueous hydraulic liquids produced in accordance with the present invention in comparison with the prior art hydraulic liquids presently in trade has been determined by means of the wear test with the wear balance according to Reichert. In this test the contact pressure upon the metal surface to be tested in combination with each hydraulic liquid is determined at which equal wear is observed at a predetermined concentration of the total of additives in the hydraulic liquid. The hydraulic liquid according to the present invention additionally contained a small amount of a known biocide.

Concentration (weight %)	Kind of hydraulic liquid		
	prior art product free of mineral oil contact pressure (bar)	prior art product containing mineral oil contact pressure (bar)	product according to inven- tion contact pressure (bar)
1	140	125	270
3	160	140	400
5	220	160	475

These results are particularly surprising with respect to the improved corrosion protection because it is known that the corrosion protection activity of usual anti-corrosion agents such as the alkanol amine salts of aryl sulfamido carboxylic acids is substantially decreased even in rather soft water when being combined with even small amounts of a surface active agent (see for instance Seifen-Öle-Fette-Wachse, vol. 102

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(1976) p. 119). Contrary thereto, the corrosion protection activity is manifold increased by the combination of active agents according to the present invention not only in soft waters but also and in particular when using water as base
5 for the aqueous hydraulic liquid which has an unusually high hardness, and the improved anti-corrosion activity is upheld independently of considerable changes in the hardness of the water. Furthermore, the lubricating activity is also substantially increased both over the prior art hydraulic
10 liquids free of mineral oil or containing mineral oil.

Active components

Many known products already used as anti-corrosion agents for metal may be used as anti-corrosion agents for metals stable in water with high hardness (component a) in the corrosion
15 decreasing combination of active products for aqueous hydraulic liquids in accordance with the present invention. In particular, the reaction products of mono-, di- and/or tri-lower alkoxy amines with boric acid, or the alkali metal or amine salts (such as alkanolamine salts) of aryl sulfonamido carboxylic
20 acids, or the phosphoric acid mono- and diesters of lower alkoxyated alkanols, phenols or naphthols may be used. Such boric esters are for instance described in US patent specification 2 441 063 or in German patent specification 1 620 447. Useful salts of arylsulfonamido carboxylic acids are described
25 for instance in German patent specifications 1 298 672 and 1 297 798 or in German Offenlegungsschrift 1 771 548 and are traded for instance under the registered trade mark HOSTACOR H.

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The above mentioned phosphoric acid esters are known for instance from German Auslegeschrift 1 276 273 and German Offenlegungsschrift 1 594 439 and are traded under the registered trade mark HOSTAPHAT. In such products fatty acid
5 groupments are bonded directly or by way of ethyleneoxide bridges to orthophosphoric acid (see Company Publication "HOSTAPHAT products for the cosmetic industry" and "HOSTAPHAT MD products" of Hoechst AG). Most preferred is a combination of products of several of these three groups of products, in
10 particular of a boric acid ester with a phosphoric acid ester. If desired, another corrosion protective agent for metals known to be instable against hard waters such as a branched C_8 to 18-fatty acid (such as isononane acid) and its salts may be added thereto.

15 Surface active agents (component b) which may be used in accordance to the present invention may be any of the known surface active agents. Preferred are such surface active agents which produce foam only to a low degree. As already mentioned, such surface active agents may also be used which themselves
20 have anti-corrosion activity such as the above mentioned phosphoric acid esters or the salts of alkyl sulfonamido carboxylic acids. Other useful surface active agents are the fatty acids having 8 to 18 carbon atoms in a straight chain, the fatty amine ethoxylates of saturated or unsaturated fatty
25 acids, oleylsarcoside, alkylaryl polyglycol ethers, alkyl polyglycol ethers, alkyl esters of C_8 to 18-fatty acids, fatty acid polyglycol esters, alkyl polyglycol ether sulfates,

C₈ to 18-fatty amides, alkylarylsulfonates, C₈ to 18-fatty alcohol polyglycol ethers, linear and branched alkane sulfonates, petroleum sulfonates or the like.

The component c) of the corrosion decreasing combination of
 5 active products in the concentrate and the final aqueous hydraulic liquid according to the present invention, i.e. the oil which is substantially insoluble in water and can be emulgated in water, is selected from the group consisting of the mixed polymers from ethylene oxide and propylene oxide having a high
 10 molecular weight, the polyalkylene glycoles such as polypropylene glycol, the fatty acid esters containing 8 to 18 carbon atoms in the molecule, the C₅ to 18-hydrocarbons and their chlorinated derivatives (chloroparaffines), if a synthetic oil. A natural oil which may be used according to the present
 15 invention, is for instance sperm oil. The chloroparaffines additionally produce useful corrosion protective properties.

The hydraulic liquid concentrate according to the present invention additionally to the above basic components a), b) and c) may contain small amounts such as 0.5 to 5 % by weight
 20 of a biocide such as dioxazolidinyl methane, a fatty acid N-methylol amide or hexahydrotriazine. It may further contain a nonferrous metal inhibiting agent such as a benztriazol compound or a mercapto benztriazol in amounts ranging from 0.1 to 0.5 % by weight. Such biocides and their use in
 25 combination with corrosion protection agents is known. The hydraulic liquid concentrates according to the present

invention may further contain small amounts of defoaming agents and/or dyestuffs.

SPECIFIC EMBODIMENTS

The following examples serve to further illustrate the
5 production of the hydraulic liquid concentrates according to the present invention as they are shipped to the mining companies for producing hydraulic liquids therefrom by dilution with water such as spring water.

EXAMPLE 1

10 For producing 100 kilograms of an aqueous hydraulic liquid concentrate in accordance with the present invention the following components are homogenously mixed:

	15.00 kg. of arylsulfamido carboxylic acid HOSTACOR H
	15.00 kg. of triethanolamine
15	3.00 kg. of morpholine
	10.00 kg. of fatty acid alkanolamide HOSTACOR DT
	7.00 kg. of alkylaryl polyglycol ether ARKOPAL N 060
	3.00 kg. of chloroparaffine HOECHST 56 liquid
	3.00 kg. of biocide Preventol OC 3011
20	0.30 kg. of benzotriazole
	43.70 kg. of water
	100.00 kg.
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For producing a hydraulic liquid to be used in the hydraulic system of a mine, the above concentrate is diluted with any kind of spring water such that the final hydraulic liquid contains a total of 1 % by weight of active components besides
 5 water.

EXAMPLE 2

For producing 100 kilograms of an aqueous hydraulic liquid concentrate in accordance with the present invention the following components are homogenously admixed:

10	5.00 kg. of boric acid product Hoe S 2688 of Hoechst AG
	20.00 kg. of isononane acid
	25.00 kg. of triethanolamine
	4.00 kg. of morpholine
	4.00 kg. of phosphoric acid ester GAFEN LB 400 of General
15	Aniline & Film Corp.
	0.20 kg. of benzotriazole
	3.00 kg. of biocide Preventol D 2
	37.80 kg. of water
	100.00 kg.
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20 The following examples recite the components for producing 100.00 kg. of the aqueous hydraulic liquid concentrate according to the present invention by homogenously admixing the same.

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EXAMPLE 3

15.00 kg. of boric acid derivative Hoe S 2687 of Hoechst AG
 15.00 kg. of arylsulfonamido carboxylic acid HOSTACOR H
 of Hoechst AG
 5 7.00 kg. of triethanolamine
 10.00 kg. of oleylsarcoside
 0.50 kg. of olein
 3.50 kg. of alkylarylsulfamido carboxylic acid Bohrmittel
 Hoechst F
 10 1.00 kg. of propylene glycol 900 of BASF
 0.20 kg. of benzotriazole
 3.00 kg. of biocide Preventol D 2
 44.80 kg. of water

 100.00 kg.
 =====

15 EXAMPLE 4

20.00 kg. of boric acid
 30.00 kg. of triethanol amine
 0.90 kg. of boric acid compound Hoe S 2687 of Hoechst AG
 4.00 kg. of phosphoric acid ester GAFEN LB 400
 20 0.20 kg. of tall oil fatty acid
 0.70 kg. of alkylarylsulfamido carboxylic acid Bohrmittel
 Hoechst F
 0.20 kg. of spindel oil
 5.00 kg. of biocide Preventol OC 3011
 25 0.30 kg. of mercaptobenzthiazole
 38.70 kg. of water

 100.00 kg.
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EXAMPLE 5

	20.00 kg. of boric acid
	30.00 kg. of boric acid compound Hoe S 2687 of Hoechst AG
	4.00 kg. of triethanolamine
5	2.00 kg. of diethanolamine
	2.00 kg. of naphthenic acid
	2.00 kg. of olein
10	2.00 kg. of the nitrogen containing block-polymer from ethyleneoxide and propyleneoxide, product GENAPOL PN 30 of Hoechst AG
	6.00 kg. of petroleum sulfonate
	2.00 kg. of chloroparaffine HOECHST 56 liquid
	0.30 kg. of benzotriazole
	3.00 kg. of biocide Preventol D 2
15	26.70 kg. of water
	<u>100.00 kg.</u>
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EXAMPLE 6

	17.00 kg. of arylsulfonamido carboxylic acid HOSTACOR H
	20.00 kg. of triethanolamine
20	4.00 kg. of oleylsarcoside
	6.00 kg. of fatty amine N-oxethylate GENAMIN O-050
	4.00 kg. of fatty acid N-alkanol amide HOSTACOR DT
	3.00 kg. of alkylaryl polyglycol ether ARKOPAL N 060
	2.00 kg. of chloroparaffine HOECHST 56 liquid
25	5.00 kg. of biocide Preventol D 2
	0.30 kg. of benzotriazole
	<u>38.70 kg. of water</u>
	<u>100.00 kg.</u>
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EXAMPLE 7

	20.00 kg. of benzoic acid
	20.00 kg. of triethanolamine
	3.00 kg. of morpholine
5	2.00 kg. of hydrazine hydrate 24 %
	6.00 kg. of alkylaryl sulfonate Hoechst
	10.00 kg. of alkane sulfonate HOSTAPUR SAS
	1.00 kg. of castor oil
	4.00 kg. of biocide Preventol OC 3011
10	0.20 kg. of benzotriazole
	33.80 kg. of water
	100.00 kg.
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EXAMPLE 8

	25.00 kg. of boric acid compound Hoe S 2687
15	15.00 kg. of isononane acid
	4.00 kg. of morpholine
	10.00 kg. of the nitrogen containing block-polymer from ethyleneoxide and propyleneoxide, product GENAPOL PN 30 of Hoechst AG
20	8.00 kg. of fatty acid N-alkanol amide HOSTACOR DT
	6.00 kg. of alkylaryl polyglycol ether ARKOPAL N 060
	1.50 kg. of sperm oil
	0.30 kg. of benzotriazole
	4.00 kg. of biocide Preventol D 2
25	36.20 kg. of water
	100.00 kg.
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EXAMPLE 9

9.00 kg. of arylsulfamido carboxylic acid HOSTACOR H
15.00 kg. of isononane acid
20.00 kg. of triethanolamine
5 3.00 kg. of diethanolamine
3.00 kg. of boric acid compound Hoe S 2687 of Hoechst AG
4.00 kg. of alkylaryl sulfamido carboxylic acid Bohrmittel
Hoechst F
0.10 kg. of spindel oil
10 3.00 kg. of biocide Preventol D 2
0.20 kg. of benzotriazole
42.70 kg. of water

100.00 kg.
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EXAMPLE 10

15 20.00 kg. of isononane acid
5.00 kg. of boric acid derivative Hoe S 2687 of Hoechst AG
25.00 kg. of triethanolamine
4.00 kg. of morpholine
15.00 kg. of fatty amine N-oxethylate GENAMIN O-050
20 1.00 kg. of sperm oil
3.00 kg. of biocide Preventol OC 3011
0.20 kg. of benzotriazole
26.80 kg. of water

100.00 kg.
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EXAMPLE 11

20.00 kg. of arylsulfamido carboxylic acid
20.00 kg. of boric acid
18.00 kg. of triethanolamine
5 5.00 kg. of morpholine
7.00 kg. of sec. alkane sulfonate HOSTAPUR SAS
4.00 kg. of phosphoric acid ester GAFEN LE 400
1.00 kg. of chloroparaffine
3.00 kg. of biocide Preventol D 2
10 0.20 kg. of benzotriazole
31.80 kg. of water

100.00 kg.
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CLAIMS:

1. An aqueous hydraulic liquid concentrate with improved corrosion protection properties to metal surfaces contacted therewith characterized in that it contains besides water
 - a) a metal corrosion protection agent stable in hard water,
5 a mixture of several of such corrosion protection agents and, possibly, another metal corrosion protection agent (different from the above agents),
 - b) a surface active agent or a mixture of several surface active agents, and
 - 10 c) a natural or synthetic oil which is substantially insoluble in water and which can be emulgated in water, or a mixture of several such oils.
2. An aqueous hydraulic liquid concentrate according to claim 1 characterized in that the components a), b) and c) are
15 present in a weight ratio of (from 10 to 500) : (from 3 to 75) : 1.
3. An aqueous hydraulic liquid concentrate according to claims 1 and 2 characterized in that it contains the components a), b) and c) are present in a weight ratio of (from 10 to
20 60) : (from 3 to 20) : 1.

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4. An aqueous hydraulic liquid concentrate according to claims
1 and 2 characterized in that it contains, calculated to
the total weight of the three components a), b) and c), the
corrosion protection agent stable in hard water or the
5 mixture of several such corrosion protection agents in an
amount corresponding to more than 50 % by weight, the oil
or the mixture of oils in an amount corresponding to 0.1 to
6 % by weight, and the surface active agent or mixture of
surface active agents as remainder amount to 100 % by weight.
- 10 5. An aqueous hydraulic liquid concentrate according to claim 4
characterized in that it contains the corrosion resistant
agent or the mixture thereof in an amount corresponding to
more than 60 % by weight, the oil or mixture of oils in an
amount corresponding to 1 to 5 % by weight besides the
15 surface active agent or mixture of several such surface
active agents as remainder amount.
6. An aqueous hydraulic liquid concentrate according to claims
1 to 5 characterized in that it additionally contains a
minor amount of one or several compounds selected from the
20 group consisting of a biocide, an nonferrous metal inhibitor,
and a lubricating agent.
7. An aqueous hydraulic liquid with improved corrosion protection
properties to metal surface s contacted therewith character-
ized in that it contains besides water 0.5 to 2 % by weight
25 of mixture of

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- a) a metal corrosion protection agent stable in hard water, a mixture of several of such corrosion protection agents and, possibly, another metal corrosion protection agent (different from the above agents),
- 5 b) a surface active agent or a mixture of several surface active agents, and
- c) a natural or synthetic oil which is substantially insoluble in water and which can be emulgated in water, or a mixture of several such oils.
- 10 8. An aqueous hydraulic liquid according to claim 7 characterized in that the components a), b) and c) are present in a weight ratio of (from 10 to 500) : (from 3 to 75) : 1.
9. An aqueous hydraulic liquid according to claims 7 and 8 characterized in that it contains the components a), b) and
- 15 c) are present in a weight ratio of (from 10 to 60) : (from 3 to 20) : 1.
10. An aqueous hydraulic liquid according to claims 7 and 8 characterized in that it contains, calculated to the total weight of the three components a), b) and c), the corrosion
- 20 protection agent stable in hard water or the mixture of several such corrosion protection agents in an amount corresponding to more than 50 % by weight, the oil or the mixture of oils in an amount corresponding to 0.1 to 6 %

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by weight, and the surface active agent or mixture of surface active agents as remainder amount to 100 % by weight.

- 5 11. An aqueous hydraulic liquid according to claim 10 characterized in that it contains the corrosion resistant agent or the mixture thereof in an amount corresponding to more than 60 % by weight, the oil or mixture of oils in an amount corresponding to 1 to 5 % by weight besides the surface active agent or mixture of several such surface active agents as
10 remainder amount.
12. An aqueous hydraulic liquid according to claims 7 to 11 characterized in that it additionally contains a minor amount of one or several compounds selected from the group consisting of a biocide, a nonferrous metal inhibitor, and a lubricating
15 agent.



European Patent
Office

EUROPEAN SEARCH REPORT

Application number
EP 79 10 2515

0007567

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<u>FR - A - 1 348 062</u> (A. PERU) * Page 2, paragraph 2 - tableau 1 * -- <u>US - A - 3 933 658</u> (J.P.G. BEIS-WANGER) * Column 1, line 48 - column 4, line 41 * -- <u>DE - A - 2 234 887</u> (R. FUCHS MINERALOELWERKE) * Claims 1,3-18; page 1, paragraphs 1,2 * -- CHEMICAL ABSTRACTS, vol. 91, no. 4, 23th July 1979, page 185, column 2, no. 23747s Columbus, Ohio, U.S.A. & PL 95 752 (INSTYTUT CIEZKIEJ SYNTEZY ORGANICZNEJ "BLACHOWNIA") 15-05-1978 * Whole abstract * --	1-12 1,7 1,6,7 12 1,7	C 10 M 3/02 C 23 F 11/10 TECHNICAL FIELDS SEARCHED (Int.Cl. ³) C 10 M 3/00 C 23 F 11/10 CATEGORY OF CITED DOCUMENTS X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons &: member of the same patent family, corresponding document
A	<u>FR - A - 1 259 532</u> (TREFILERIES ET LAMINOIRS DU HAVRE)		
A	<u>FR - A - 2 360 658</u> (SINGER & HERSCH INDUSTRIAL DEVELOPMENT)		
A	<u>DE - A - 2 752 218</u> (BASF)		
A	<u>DE - A - 2 759 233</u> (BASF)		

<i>b</i> The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		07-11-1979	RO TSAERT