(19) DANMARK

(10) DK/EP 2090622 T3

(12) Oversættelse af europæisk patentskrift

Patent- og Varemærkestyrelsen

(51) Int.Cl.: *C 09 D 5/02 (2006.01)* *B 01 F 3/08 (2006.01)* *C 04 B 26/22 (2006.01)*
C 04 B 111/00 (2006.01) *C 08 J 3/03 (2006.01)* *C 08 K 3/00 (2006.01)*
C 08 K 5/103 (2006.01) *C 08 L 7/02 (2006.01)* *C 08 L 91/00 (2006.01)*
C 08 L 93/04 (2006.01) *C 09 D 5/00 (2006.01)* *C 09 D 107/02 (2006.01)*
C 09 D 191/00 (2006.01) *C 09 D 193/04 (2006.01)* *C 09 J 191/00 (2006.01)*
C 09 J 193/04 (2006.01)

(45) Oversættelsen bekendtgjort den: **2015-09-14**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2015-06-10**

(86) Europæisk ansøgning nr.: **09305130.8**

(86) Europæisk indleveringsdag: **2009-02-12**

(87) Den europæiske ansøgnings publiceringsdag: **2009-08-19**

(30) Prioritet: **2008-02-13 FR 0850916**

(84) Designerede stater: **AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR**

(73) Patenthaver: **COLAS, 7, Place René Clair, 92100 Boulogne-Billancourt, Frankrig**

(72) Opfinder: **DENEUVILLERS Christine, 4 Allée Dugay Trouin, 78310 MAUREPAS, Frankrig**
LECONTE Daniel, 17 Rue des Arts Réunis, 76100 ROUEN, Frankrig
BRICOUT Xavier, 2 Rue des Berges, 78960 VOISINS LE BRETONNEUX, Frankrig

(74) Fuldmægtig i Danmark: **Chas. Hude A/S, H.C. Andersens Boulevard 33, 1780 København V, Danmark**

(54) Benævnelse: **Vandig emulsion, som omfatter et bindemiddel med mindst én forbindelse, der stammer fra vedvarende ressourcer, maling eller belægning, som omfatter en sådan emulsion**

(56) Fremdragne publikationer:
EP-A- 1 466 878
WO-A-2005/077996
US-A1- 2003 145 516
US-B1- 6 589 442
ANONYME: "FICHE DE DONNÉES DE SÉCURITÉ: Stabiram 3070", CECA: ARKEMA GROUP, [Online] 30 septembre 2003 (2003-09-30), pages 1-4, XP002495534, Extrait de l'Internet: URL:http://cmt.ecritel.net/cmt_bin/wfds-af fform?NFou=CECA%C2%A7FR_PI&Lang=EN> [extrait le 2008-09-11]

The present invention relates to a paint or coating comprising an aqueous emulsion including a binder with at least one compound coming from renewable resources. It has applications in the civil engineering field and especially for road marking or as a floor covering in order to protect concretes or asphalt mixes.

The products, especially of the aqueous paint and coating type, are generally made based on of emulsions from starting materials derived from petrochemicals. Even if they have the advantage of implementing water, these products derived from petrochemicals, however, have the disadvantage that they are obtained from non-renewable resources.

In the present context of reducing carbon emissions from non-renewable resources, it has been understood that it is desirable to develop products of this type but which implement binders based on components obtained from renewable resources, in practice, plant, and especially agricultural, including forest, aquatic (aquatic plants), as a substitute for the usual petrochemical binders for these paint, coating, ink, varnish, adhesive and glue applications. Such products have thus the quantified benefits related to the sustainable development criteria.

Thus, a rosin resin emulsion is known from the US Patent 6,369,119 B1 deposited by Rasio Chemicals UK Ltd in 2002. It is known from the US Patent 5,288,782 an implementation of a rosin resin emulsion as sizing and finishing agent for the paper industry and intended to increase the cellulose substrate wetting resistance in aqueous medium. It is also known form the FR Patent 2 867 192 in the name of the ALBAC Company, a paint based on vegetable or animal oil stand oil and natural emulsifiers. However, in this latter document, the natural resin is in very small quantities (0.5% to 10%), as an additive, and in order to increase the hardness, the softness or the brilliance of the emulsion depending on the desired use. A binder of plant origin is also known form the FR-2853647 application.

The document WO 2005/077996 discloses a tackifier dispersion comprising: resin, emulsifier and water.

The document US 2003/0145516 discloses an additive composition useful for preparing a synthetic combustion composition.

The document US 6,589,442 discloses a dust control composition in emulsion form comprising a crude tall oil and vegetable oil mixture.

Basically, the product proposed by the present invention is a paint or a coating comprising an aqueous emulsion, as described in the set of claims, said aqueous emulsion including a binder with at least one compound coming from renewable resources.

According to the invention, the emulsion comprises:
on one hand, a binder phase resulting from the mixing of at least one rosin resin and at least one vegetable oil or vegetable oil derivative, in the binder phase, the rosin resin representing from 81% to 95%, and the vegetable oil or vegetable oil derivative representing the balance to 100% of the binder phase, and on the other hand, an aqueous phase comprising at least one surfactant and water, in the emulsion, the binder phase representing from 20% to 80%, the surfactant from 0.01% to 20% and the water the balance to 100%, the percentages being by weight.

The first essential component of the binder phase is the rosin resin. By rosin resin, it is meant natural rosin, but also modified rosins, especially by esterification. Esterified rosins include glycerol or pentaerythritol-esterified rosins.

Preferably, the binder phase comprises a glycerol or pentaerythritol-esterified rosin, or a mixture of these two esterified rosins.

The second essential component of the binder phase is the vegetable oil or vegetable oil derivative.

The vegetable oil which may be natural or modified is, for example, an oxidized oil or even a stand oil (oil cooked near its boiling point and polymerized).

The vegetable oil and vegetable oil derivative are selected from crude or refined vegetable oils and derivatives thereof, the latter being selected from esters, fatty acids, oxides or stand oils.

The vegetable oil derivative is a polymerized vegetable oil.

The vegetable oils (natural or as base oils for modified oils) include soybean, linseed, sunflower, rapeseed, grape seed, peanut, olive, canola, safflower, coconut, wheat germ, corn, nut, almond, palm, sesame, chinawood or tung, castor, cottonseed oils, and mixtures thereof.

The vegetable oil may also be a vegetable oil derivative or a mixture of vegetable oil derivatives such as fatty acids, fatty alcohols, fatty acid esters, chemically modified fatty acid esters.

The fatty acid esters are obtained by transesterification of vegetable oils with an alcohol. The preferred fatty acid esters are fatty acid triglyceride esters (glycerin esterified by fatty acid molecules) and comprising unsaturations. Triglycerides can be obtained by seed crushing or oil extraction, (their hydrolysis results in glycerol and fatty acids).

The fatty acids may be saturated or unsaturated fatty acids, monocarboxylic comprising from 6 to 24 carbon atoms, dicarboxylic comprising from 12 to 48 carbon atoms and/or tricarboxylic comprising from 18 to 72 carbon atoms.

Preferably, the fatty acids are isolated or derived from a vegetable oil selected from natural vegetable oils and modified vegetable oils, and for example, from soybean, linseed, sunflower, rapeseed, grape seed, peanut, olive, canola, safflower, coconut, wheat germ, corn, nut, almond, palm and sesame oils, and mixtures thereof.

As an example, the linear saturated fatty acids can be selected from caproic acid, caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, margaric acid, stearic acid, arachidic acid, behenic acid, and lignoceric acid.

As an example, the monocarboxylic unsaturated fatty acids can be selected from palmitoleic acid, oleic acid, vaccenic acid, linoleic acid, linolenic acid, arachidonic acid, eicosapentaenoic acid, erucic acid, docosahexaenolic acid, nervonic acid, and nonanoic acid.

The fatty acids defined above are monocarboxylic fatty acids suitable for producing a base binder consistent with the invention.

Fatty acids also suitable for producing a base binder consistent with the invention are polymerized fatty acids comprising more than one carboxylic function, and are, for example, in fatty acid form as dimers or trimers.

Examples of dicarboxylic fatty acids in dimer form, also suitable for producing a base binder consistent with the invention include fatty acids comprising from 12 to 48 saturated or unsaturated carbon atoms, preferably, unsaturated, and especially, the unsaturated fatty acids comprising 18 carbon atoms whose CAS reference is 61788-89-4.

Finally, examples of tricarboxylic fatty acids in trimer form, suitable for producing a base binder consistent with the invention include fatty acids comprising from 18 to 72 saturated or unsaturated carbon atoms, preferably, unsaturated, and especially, the unsaturated fatty acid comprising 18 carbon atoms whose CAS reference is 68937-90-6.

The aqueous phase comprises essentially water and one or more surfactants.

The surfactants can be cationic, zwitterionic, or anionic or nonionic.

The surfactants include alkylpolyglucosides (APG), alkyl sulfates, peptide fatty acid or amino acid condensates, amine salts, sucrose esters, fatty alcohols, glycerol or (poly)glycerol esters, glycine betaine esters or amides, modified rosin resins (maleinized or acidified or esterified), soya lecithin, methyl ether sulfonates, phospholipids, phosphatidylcholines, glycine betaine esters or amides. Preferred surfactants include the polymerized rosin (polygral®), hydrophobic inulin (Innutec SP1t®) or lauryl glucoside (glucopon®). The surfactants may be optionally saponified compounds.

When the binder comprises rosins having a surfactant activity, the surfactant can be fully or partly provided by the binder.

In a recommended embodiment, the emulsion comprises:

i) a binder phase representing from 40% to 75% by weight relative to the weight of the emulsion and comprising:
- from 81 to 95%, more preferably, from 84% to 95% by weight relative to the weight of the binder phase of at least one rosin resin, preferably, esterified by glycerol or pentaerythritol and
- the balance to 100% of the binder phase of at least one vegetable oil preferably selected from linseed or soybean oil,
ii) an aqueous phase comprising from 0.5% to 3%, preferably from 1 to 2.5% by weight of at least one surfactant preferably selected from a polymerized rosin, preferably saponified, or a hydrophobic inulin surfactant, preferably saponified, and the balance to 100% by weight of water relative to the weight of the emulsion.

In a recommended embodiment, the emulsion comprises, on one hand, a binder comprising a pentaerythritol-esterified rosin resin in an amount of from 85% to 95% by weight of the binder, a soybean oil in an amount of from 5% to 15% by weight of the binder, the binder representing from 45% to 75%, preferably from 50% to 70% by weight of the emulsion and, on the other hand, as a surfactant, a

polymerized rosin, preferably saponified in an amount of from 1% to 3%, preferably from 1.5% to 2.5% by weight of the emulsion and water for the balance to 100% by weight.

A particular example of an emulsion such as defined above includes the emulsion comprising:

- 60% by weight of a binder consisting of 90% by weight of a pentaerythritol-esterified rosin and 10% of soybean oil,
- 2% by weight of polymerized rosin (surfactant),
- 1% by weight of aqueous sodium hydroxide solution (surfactant saponifier), and
- water for the balance to 100%.

According to another embodiment, the emulsion comprises, on one hand, a binder comprising a glycerin-esterified rosin resin in an amount of from 81 to 90% by weight of the binder, the balance to 100% of the binder phase of a linseed oil, the binder representing from 40% to 60%, preferably from 45% to 55% by weight of the emulsion and, on the other hand, a hydrophobic inulin surfactant, preferably saponified in an amount of from 0.5% to 2.5%, preferably from 1% to 2% by weight of the emulsion, and water for the balance to 100% by weight of the emulsion.

An example of an emulsion as defined above includes an emulsion comprising:

- 50% by weight of a binder consisting of 85% by weight of glycerin-esterified rosin and 15% by weight of linseed oil;
- 1.6% by weight of hydrophobic inulin (surfactant);
- 0.4% by weight of 30% aqueous sodium hydroxide solution (surfactant saponifier); and
- the balance of water.

The emulsion according to the invention is primarily intended to be implemented in a paint or coating but may be also implemented in an ink, an adhesive or a glue.

Hence, the invention thus relates to an aqueous emulsion-based paint (including varnishes) or coating comprising a binder with at least one compound coming from renewable resources, such as previously defined.

The coatings for marking differ from surface coatings. According to the invention, a coating for marking consists primarily of the mixture of a binder, optionally as an emulsion, and fillers, generally mineral, having a mean diameter of 1 mm or less.

By comparison, the surface coatings are surface layers obtained by virtually simultaneous, but separate spreading of a binder and gravels. Gravels are aggregates of d/D dimension with $d \geq 1$ (d: the smallest dimension) and $D \leq 31.5$ (D: the largest dimension).

The paint or coating may especially comprise by weight relative to the total weight of the paint or coating:

- from 20% to 50%, preferably from 25 to 35% of an aqueous emulsion comprising:

i) a binder phase representing from 20% to 80% by weight relative to the weight of the emulsion and comprising:

- from 81% to 95%, and more preferably from 95% to 84% by weight relative to the weight of the binder phase of at least one rosin resin and
- the balance to 100% of the binder phase of at least one vegetable oil or vegetable oil derivative,

ii) an aqueous phase comprising from 0.01% to 20% by weight of at least one surfactant and the balance to 100% by weight of water relative to the weight of the emulsion,

- from 20% to 80% fillers and any pigment(s).

Preferably, the binder phase comprises from 81 to 95% by weight of rosin resin and from 19% to 6% vegetable oil.

The paint or coating can especially include by weight from 20% to 50%, preferably from 20 to 45% and more preferably from 25% to 35% of said emulsion, optionally up to 20%, preferably up to 10% natural latex, from 1% to 10% additives and from 20% to 80%, preferably from 25% to 50% fillers and any pigments(s).

The natural latexes suitable for the paints or coatings of the invention include natural rubber latexes.

The additives can be any additives conventionally used in paints or coatings such as dispersants (for example BR3® of the COATEX Company), thickeners, surfactants (for example a nonionic secondary alcohol ethoxylate: Tergitol® 15-S-40 of the UNION CARBIDE Company) and antifoams (for example Drew 4202 of the ASHLAND Company).

The fillers suitable for the present invention include alkaline earth carbonates such as calcium carbonate, silica, glass powder and beads (hollow or not), microvoid polymers, marble powder and agglomerates, chalk, talc, dolostone and extenders (silicates, sulfates, wollastonites, aluminosilicates, aluminum hydrates), etc. and mixtures thereof.

Pigments include mineral pigments as metal oxides such as titanium oxide, iron oxides, zinc-whites, lithopone and synthetic or natural organic pigments such as azo pigments and naphthols.

Still among pigments, can be mentioned pigments of plant (or animal), agricultural, forest or aquatic origin as the dyer's madder (Rubia tinctorum L.), weld or dyer's rocket (Reseda luteola L.), heathlands (Genista tinctoria L.), goldenrod (Solidago canadensis L.), yellow cosmos (Cosmos sulphureus Cav.), dyer's coreopsis (Coreopsis tinctoria Nutt.), dyer's sorghum (Sorghum bicolor (L.) Moench.), woad (Isatis tinctoria L.), logwood (Haematoxylon campechianum L.), taxa brazilwood or Pernambuco (Caesalpinia echinata Lam.), quebracho (Schi-

nopsis lorentzii Engl.), gambier (Uncaria gambir Roxb.), sweet chestnut (Castanea sativa L.), or indigo (Indigofera anil L.), or buckthorn, chlorophyll, cochineal, myrobalan, gallnut, genipa or resinous wood.

The fillers and pigments of the coating or paint of the invention preferably have a mean diameter lower than 1 mm.

A paint according to the invention comprises from 20 to 45%, preferably from 20% to 35%, and more preferably from 25% to 35% by weight of an emulsion according to the invention, from 0 to 20%, preferably from 0 to 5% by weight of a natural latex, from 15% to 20% by weight of pigment, from 25 to 40% fillers, from 1% to 5% by weight of additives and the balance to 100% being water.

As an example, a paint comprising 29.3% of said emulsion, 3% natural latex, 18% pigment (titanium oxide), 36% filler (calcium carbonate + glass beads), 2.2% additives and the balance to 100% water can be mentioned, the percentages being by weight, the vegetable emulsion being based on pentaerythritol-esterified rosin resin, refined soybean oil, saponified polymerized rosin and water, and the additives are dispersant, thickener and antifoam.

Examples further include:

- a paint comprising 26.5% of said emulsion, 5% natural latex, 18% pigment (titanium oxide), 37% filler (calcium carbonate + glass beads), 2.2% additives and the balance to 100% water, the percentages being by weight, the vegetable emulsion being based on pentaerythritol-esterified rosin resin, refined soybean oil, hydrophobic saponified inulin and water, and the additives are dispersant, thickener and antifoam,
- a paint comprising 43% of said emulsion, 15% pigment (titanium oxide + natural ochre), 27% filler (calcium carbonate + glass beads), 2.2% additives and the balance to 100% water, the percentages being by weight, and the vegetable emulsion being based on glycerol-esterified rosin resin, refined soybean oil, hydrophobic saponified inulin and water, and the additives are dispersant, thickener and antifoam.

It should be noted that in the scope of the present invention, the terms paint (including varnishes) and coating are to be considered equivalent, the basic components of these two types of products being essentially the same and the essential difference is the viscosity of the product considered which may be controlled according to the relative proportions of the basic components or the addition of one or more specific elements that may increase the viscosity as well as the particle size and the final thickness of the product film.

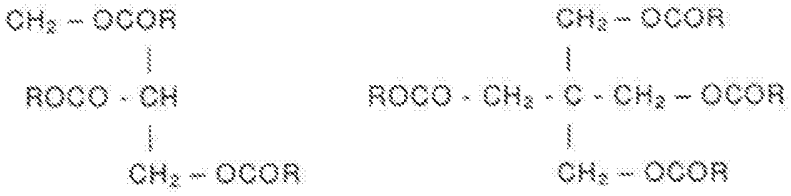
The present invention will be now exemplified, but not limited to, with the following description of embodiments.

As stated earlier, the present invention is implemented especially for carrying out road markings or as a floor covering in order to protect concretes or asphalt mixes. The products made using these implementations preferably comply with standards related to the expected implementation and especially the standard EN1436 which defines, for road users, the performance of the white and yellow road markings as to their daylight reflection (RL), their retroreflection under vehicle headlight illumination (QD), their color and their skid (SRT). The corresponding products meet the following minimum requirements in France on dry road:

	White	Yellow	Units
RL	>= 150	>= 200	mCd/lx/m^2
QD	>= 100	>= 80	mCd/lx/m^2
SRT	>= 0.45	>= 0.45	

Among the pigments that can be used in road applications, iron oxide yellow, titanium oxide and rutile titanium dioxide can be mentioned non-restrictively.

Preferably, an emulsion is implemented comprising a glycerol and/or pentaerythritol-esterified rosin whose chemical formulas are respectively:



(R = rosin moiety)

Two emulsions were made from rosin resin respectively esterified with pentaerythritol and glycerol.

The first emulsion comprises for the binder: a pentaerythritol-esterified rosin resin (Dertoline® P2L) in an amount of 90% by weight of the binder, a soybean oil (fluxing agent) in an amount of 10% by weight of the binder, the binder representing 60% by weight of the emulsion. The binder is prepared hot (140°C) in a homogenizer run at 7700 rpm. This first emulsion also includes, in the aqueous phase, a soap made with a polymerized rosin surfactant (polygral®) in an amount of 2% by weight of the emulsion and 30% concentrated sodium hydroxide in an amount of 1% by weight of the emulsion. Finally, this first emulsion comprises water for the balance to 100% by weight of the emulsion, about 40% water.

The second emulsion comprises for the binder: a glycerol-esterified rosin resin (Dertoline® G2L) in an amount of 85% by weight of the binder, a linseed oil in an amount of 15% by weight of the binder, the binder representing 50% by weight of the emulsion. The binder is prepared hot (140°C) in a homogenizer run at 8000 rpm. This second emulsion also includes a soap made with a hydrophobic inulin (Innutec SP1t) in an amount of 1.6% by weight of the emulsion and 30% concentrated sodium hydroxide in an amount of 0.4% by weight of the emulsion. Finally, this second emulsion comprises water for the balance to 100% by weight of the emulsion, about 50% water.

It should be noted that optionally, a soap with lauryl glucoside (glucopon® 650EC) can be made.

The compositions and the main physicochemical properties measured on these two emulsions are given in the following table.

	Emulsion 1 (1 tonne)	Emulsion 2 (1 tonne)
Manufacturing MOPCST EM-001-1/EM-001-2		
Binder phase of the emulsion kg/t	600	500
Binder formula (%) Rosin resin Fluxing agent	 P2L resin 90% soybean oil 10%	 G2L resin 85% Linseed oil 15%
Temperature °C Homogenizer speed rpm	140 7700	140 8000
Aqueous phase Formula Water (balance to) Temperature °C Aqueous phase regimen l/h pH of the aqueous phase	 Polygral 20Kg/t NaOH(30%) 10Kg/t 400Kg/t 50 50 >12	 Innutec SP1t 16Kg/t NaOH(30%) 4Kg/t 500Kg/t 70 60 >12
Binder incorporation time	2min-2min30	2min-2min30
Racking after x minutes after the end of incorporation	1 min	1 min
Dry extract (infrared balance) % MOPCST PC-011 Water content %	 39.3	 50.8

Laser granulometry at J+1 MOPCST EM-005 Median diameter µm Standard deviation (log10) µm	 0.56 0.34	 0.78 0.41
pH NF EN 12850 Temperature °C	9.6 20	9.1 20
Visco (Cp ac RV3-100RPM) at J+1	273 mPa.s	(R2V100) 66 mPa.s

Three paint formulations were made from the two previous emulsions. The corresponding formulations are given in the following three tables.

Paint 1

	Type of product	Tradename	Supplier	Percentage by mass
Emulsion	Pentaerythritol-esterified rosin resin	Dertoline P2L	DRT	15
	Vegetable oil	Refined soybean oil	Cargill	3
	Polymerized rosin surfactant	Polygral	DRT	0.6
	Saponifier	Sodium hydroxide (diluted 30%)	Carlo Erba	0.3
	Water			10.4
Latex	Natural latex	Natural latex	Lambert Rivière	3
Pigment	Titanium oxide	Titanpol R-001	ZschPolice	18

Fillers	Calcium carbonate	Durcal 5	Omya	28
	Glass beads	Aq 0/45	Potters	8
Paint additives	Antifoam	Drewplus Tg 4202	Ashland	0.5
	Dispersant	Coatex BR3	Coatex	1.5
	Thickeners	Byk 420	Byk Chemie	0.2
Water				11.5
			TOTAL	100

Paint 2

	Type of product	Tradename	Supplier	Percentage by mass
Emulsion	Pentaerythritol-esterified rosin resin	Dertoline P2L	DRT	12.5
	Vegetable oil	Refined soybean oil	Cargill	1.5
	Hydrophobic inulin surfactant	Innutec Sp1tl	Orafti	1
	Saponifier	Sodium hydroxide (diluted 30%)	Carlo Erba	0.5
	Water			11
Latex	Natural latex	Natural latex	Lambert Rivière	5
Pigment	Titanium oxide	Titanpol R-001	ZschPolice	18
Fillers	Silica	Millicil C300	Omya	28
	Glass beads	Aq 0/45	Potters	9
Paint additives	Antifoam	Drewplus Tg 4202	Ashland	0.5
	Dispersant	Coatex 123	Coatex	1.5
	Thickeners	Byk 420	Byk Chemie	0.2
Water				11.3
			TOTAL	100

Paint 3

	Type of product	Tradename	Supplier	Percentage by mass
Emulsion	Glycerol-esterified rosin resin	Dertoline G2L	DRT	22.5
	Vegetable oil	Refined soybean oil	Cargill	4.5
	Hydrophobic inulin surfactant	Innutec Sp1t	Orafti	0.9
	Saponifier	Sodium hydroxide (diluted 30%)	Carlo Erba	0.45
	Water			15.45
Pigment	Titanium oxide Natural ochre	Titanpol R-001 Ocre havane	ZschPolice Maison de l'écologie	9 6
Fillers	Calcium carbonate	Durcal 5	Omya	22
	Glass beads	Aq 0/45	Potters	5
Paint additives	Antifoam	Drewplus Tg 4202	Ashland	0.5
	Dispersant	Coatex BR3	Coatex	1.5
	Thickeners	Byk 420	Byk Chemie	0.2
Water				12
			TOTAL	100

It is understood that values and proportions given both for the emulsion and paints are indicative and they can be varied for the same formulations or other formulations within the scope of the invention.

Paint characteristics

	Method	Paint N°1	Paint N°2	Paint N°3
Dry extract	NF EN ISO 3251	76%	77%	75%
Ash content	NF T 30-012	60%	43%	59%
Brookfield viscosity (RV4/ 10 RPM)	ISO 2555	5880 mPa.s	3040 mPa.s	5540 mPa.s
Brookfield viscosity (PVA/ 100 RPM)	ISO 2555	1250 mPa.s	858 mPa.s	1120 mPa.s
BK drying time	NF L 16-116	35 min	42 min	37 min
Persoz hardness (J+1)	NF EN ISO 1522	17 sec	37 sec	22 sec
MFFT	ISO 2115	1.5°C	4°C	2°C

From these paint formulations, a hard film is obtained in few minutes at room temperature with a very good film forming effect. The thin layer spray application may allow the drying time to be reduced to less than 10 minutes. Finally, these paints have excellent mechanical characteristics.

Patentkrav

1. Maling eller belægning, som i forhold til den samlede vægt af malingen eller belægningen omfatter:

- fra 20 til 50 vægtprocent af en vandig emulsion, som omfatter:

i) en bindemiddelfase, som repræsenterer 20 til 80 vægtprocent i forhold til vægten af emulsionen, og som omfatter:

- 81 til 95 vægtprocent i forhold til vægten af bindemiddelfasen af mindst én kolofoniumharpiks og
- mindst én vegetabilsk olie eller et vegetabilsk oliederivat som den resterende andel op til 100% af bindemiddelfasen,

ii) en vandig fase, som omfatter 0,01 til 20 vægtprocent af mindst ét overfladeaktivt middel og vand som den resterende andel op til 100 vægtprocent i forhold til vægten af emulsionen,

- fra 20 til 80% fyldstoffer og et eller flere eventuelle pigmenter.

2. Maling eller belægning ifølge krav 1, **kendetegnet ved**, at kolofoniumharpiksen er valgt blandt et eller flere af følgende produkter: naturligt kolofonium, et kolofoniumderivat, som navnlig er dannet ved esterificering, idet, i sidstnævnte tilfælde, det esterificerede kolofoniumderivat fortrinsvis er esterificeret ved hjælp af glycerol eller pentaerythritol.

3. Maling eller belægning ifølge krav 1 eller 2, **kendetegnet ved**, at den vegetabilske olie og det vegetabilske oliederivat er valgt blandt rå eller raffinerede vegetabilske olier og derivater deraf, hvor disse sidstnævnte er valgt blandt fedtsyrer, fedtalkoholer, fedtsyreestere, kemisk modificerede fedtsyreestere, oxider eller standolier.

4. Maling eller belægning ifølge krav 1, 2 eller 3, **kendetegnet ved**, at olien stammer fra et eller flere af følgende produkter: sojaolie, hørfrøolie, solsikkeolie,

rapsolie, vindruekerneolie, jordnødolie, olivenolie, canolaolie, tidselolie, kokosolie, hvedekimolie, majsolie, nøddeolie, mandelolie, palmeolie, sesamolie, kinatræsolie eller tungolie, ricinusolie, bomuldsfrøolie.

5. Maling eller belægning ifølge et hvilket som helst af kravene 1-4, **kendetegnet ved**, at det overfladeaktive middel er et kationisk, anionisk, zwitterionisk eller ikke-ionisk overfladeaktivt middel.

6. Maling eller belægning ifølge krav 5, **kendetegnet ved**, at det eller de overfladeaktive midler er valgt blandt alkylpolyglucosider (APG), alkylsulfater, peptidfedtsyre- eller aminosyrekondensater, aminsalte, saccharoseestere, fedtalkoholer, (poly)glycerolestere, estere eller amider af glycinbetainer, modificerede kolofoniumharpikser, sojalecithin, methylethersulfonater, phospholipider, phosphatidylcholiner, estere eller amider af glycinbetain.

7. Maling eller belægning ifølge krav 6, **kendetegnet ved**, at det overfladeaktive middel eller mindst ét af de overfladeaktive midler er et kolofoniumderivat, **og ved**, at når bindemiddelfasen omfatter det samme kolofoniumderivat, så tilvejebringes det overfladeaktive middel i det mindste delvist af bindemiddelfasen.

8. Maling eller belægning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved**, at den vandige emulsion på den ene side omfatter et bindemiddel, der omfatter en pentaerythritol-esterificeret kolofoniumharpiks i en mængde på 85 til 95 vægtprocent af bindemidlet, en sojaolie i en mængde på 5 til 15 vægtprocent af bindemidlet, hvor bindemidlet udgør 45 til 75 vægtprocent af emulsionen, og på den anden side omfatter et overfladeaktivt middel af forsæbet polymeriseret kolofonium i en mængde på 1 til 3 vægtprocent af emulsionen og vand som den resterende andel op til 100 vægtprocent af emulsionen.

9. Maling eller belægning ifølge et hvilket som helst af kravene1-7, **kendetegnet ved**, at den vandige emulsion på den ene side omfatter et bindemiddel, der omfatter en glycerol-esterificeret kolofoniumharpiks i en mængde på 81 til 90 vægtprocent af bindemidlet og en hørfrøolie som den resterende andel op til 100

vægtprocent af bindemiddelfasen, hvor bindemidlet udgør 40 til 60 vægtprocent af emulsionen, og på den anden side omfatter et overfladeaktivt middel af forsæbet hydrofobt inulin i en mængde på 0,5 til 2,5 vægtprocent af emulsionen og vand som den resterende andel op til 100 vægtprocent af emulsionen.

10. Maling eller belægning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved**, at den omfatter indtil 20% naturlig latex og 1 til 10% additiver.

11. Maling ifølge et hvilket som helst af de foregående krav, **kendetegnet ved**, at den omfatter fra 20 til 35 vægtprocent af emulsionen, 0 til 20 vægtprocent naturlig latex, fra 15 til 20 vægtprocent af et pigment, fra 1 til 5 vægtprocent additiver, og hvor den resterende andel op til 100 vægtprocent er vand.

12. Maling ifølge krav 11, **kendetegnet ved**, at den omfatter 29,3% af emulsionen, 3% naturlig latex, 18% titanoxid, 36% calciumcarbonatfyldstof + glaskugler, 2,2% additiver og vand som den resterende andel op til 100%, idet procentdelene er vægtbaserede, og den vegetabilske emulsion er baseret på pentaerythritol-esterificeret kolofoniumharpiks, raffineret sojaolie, forsæbet polymeriseret kolofonium og vand, og additiverne er dispergeringsmiddel, fortykningsmiddel og skumdæmpende middel.

13. Maling ifølge krav 11, **kendetegnet ved**, at den omfatter 26,5% af emulsionen, 5% naturlig latex, 18% titanoxid, 37% calciumcarbonatfyldstof + glaskugler, 2,2% additiver og vand som den resterende andel op til 100%, idet procentdelene er vægtbaserede, og den vegetabilske emulsion er baseret på pentaerythritol-esterificeret kolofoniumharpiks, raffineret sojaolie, forsæbet hydrofobt inulin og vand, og additiverne er dispergeringsmiddel, fortykningsmiddel og skumdæmpende middel.

14. Maling ifølge krav 11, **kendetegnet ved**, at den omfatter 43% af emulsionen, 15% titanoxid + naturlig okker, 27% calciumcarbonatfyldstof + glaskugler, 2,2% additiver og vand som den resterende andel op til 100%, idet procentdelene er vægtbaserede, og den vegetabilske emulsion er baseret på glycerol-esterificeret

kolofoniumharpiks, raffineret sojaolie, forsæbet hydrofobt inulin og vand, og additiverne er dispergeringsmiddel, fortykningsmiddel og skumdæmpende middel.

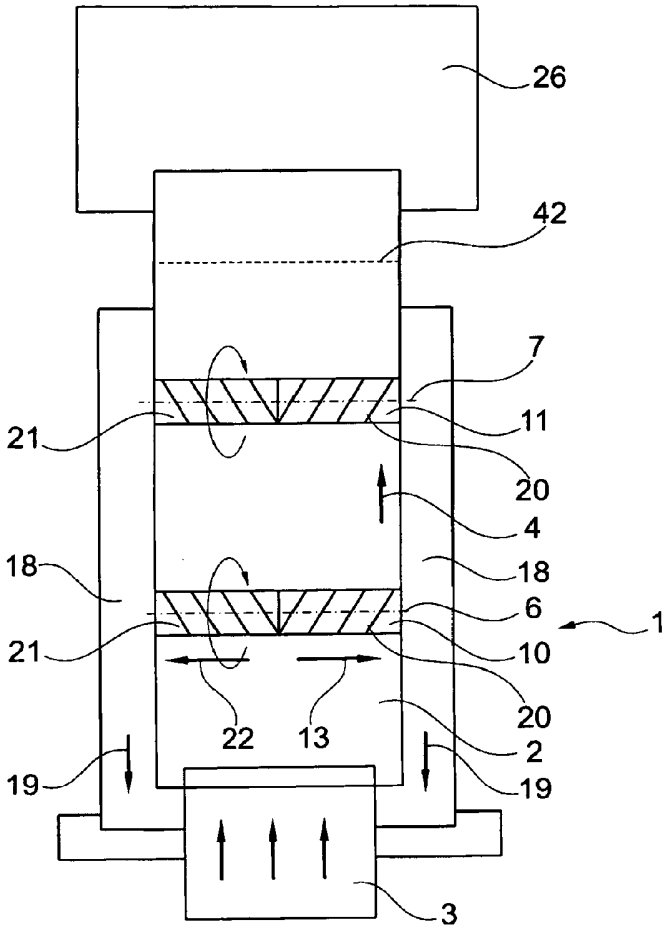


Fig. 1a

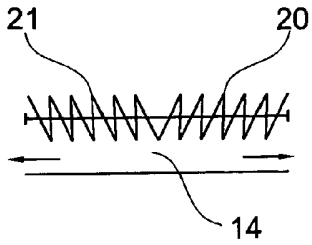


Fig. 1b

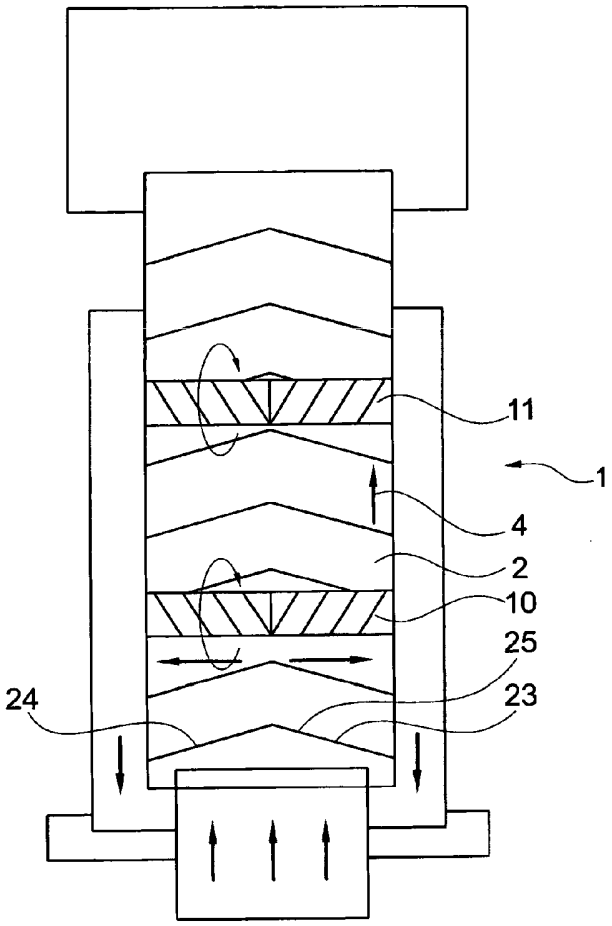


Fig. 2a

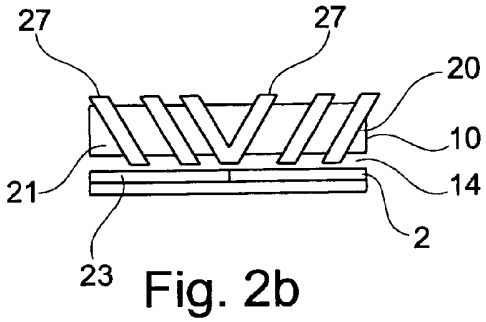


Fig. 2b

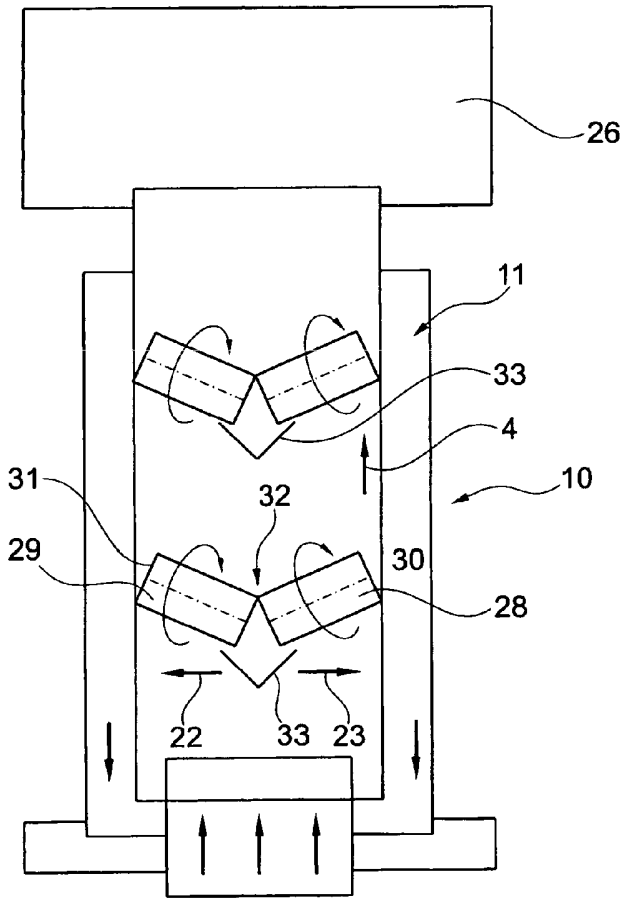


Fig. 3