



(72) WOCHNOWSKI, HORST, DE

(72) SCHNEIDER, ANGELA, DE

(72) SCHNEIDER, VALENTINA, DE

(72) NIEMEYER, PETER, DE

(71) ACMOS CHEMIE GMBH & CO., DE

(51) Int.Cl.⁶ B29C 33/60, C10M 125/14, C10M 173/00, B29C 37/00

(30) 1998/05/28 (198 23 883.5) DE

(30) 1998/05/29 (198 24 279.4) DE

(54) **AGENT DE DEMOULAGE, SON UTILISATION ET SON
PROCEDE DE PRODUCTION**

(54) **PARTING AGENT, ITS USE AND PROCESS FOR ITS
PRODUCTION**

(57) L'invention concerne un agent de démoulage, contenant comme substances facilitant le démoulage, des huiles, cires, silicones et/ou savons, ainsi que des émulsifiants et d'autres additifs usuels dans un support, ledit support étant constitué d'un mélange qui contient au moins un hydrocarbure et de l'eau et qui se présente sous forme d'une dispersion eau dans l'huile. L'invention concerne également l'utilisation de cet agent de démoulage ainsi que son procédé de production.

(57) The invention relates to a release agent which as releasing substances contains oils, waxes, silicones and/or soaps as well as emulsifiers and other usual additives in a carrier, which carrier is a mixture of at least one hydrocarbon and water and is present in the form of a water-in-oil dispersion. The invention also relates to the use of the release agent and to a method for producing same.



PCT
WELTORGANISATION FÜR GEISTIGES EIGENTUM
Internationales Büro
INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE
INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

<p>(51) Internationale Patentklassifikation ⁶ : B29C 33/60, 37/00, C10M 173/00, 125/14</p>	A1	<p>(11) Internationale Veröffentlichungsnummer: WO 99/61215</p> <p>(43) Internationales Veröffentlichungsdatum: 2. Dezember 1999 (02.12.99)</p>
<p>(21) Internationales Aktenzeichen: PCT/EP99/03575</p> <p>(22) Internationales Anmeldedatum: 25. Mai 1999 (25.05.99)</p> <p>(30) Prioritätsdaten: 198 23 883.5 28. Mai 1998 (28.05.98) DE 198 24 279.4 28. Mai 1998 (28.05.98) DE</p> <p>(71) Anmelder: ACMOS CHEMIE GMBH & CO. [DE/DE]; Industriestrasse 37-49, D-28199 Bremen (DE).</p> <p>(72) Erfinder: WOCHNOWSKI, Horst; Gorch-Fock-Weg 26d, D-22844 Norderstedt (DE). SCHNEIDER, Angela; Poelzigstrasse 6, D-28205 Bremen (DE). SCHNEIDER, Valentina; Zwoller Strasse 8, D-28259 Bremen (DE). NIEMEYER, Peter; Gneisenauweg 9c, D-27755 Delmen- horst (DE).</p> <p>(74) Anwalt: WINKLER, Andreas; Boehmert & Boehmert, Holler- allee 32, D-28209 Bremen (DE).</p>		<p>(81) Bestimmungsstaaten: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO Patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Veröffentlicht <i>Mit internationalem Recherchenbericht. Vor Ablauf der für Änderungen der Ansprüche zugelassenen Frist; Veröffentlichung wird wiederholt falls Änderungen eintreffen.</i></p>
<p>(54) Title: RELEASE AGENT, ITS USE AND METHOD FOR PRODUCING SAME</p> <p>(54) Bezeichnung: TRENNMITTEL, DESSEN VERWENDUNG SOWIE VERFAHREN ZU SEINER HERSTELLUNG</p> <p>(57) Abstract</p> <p>The invention relates to a release agent which as releasing substances contains oils, waxes, silicons and/or soaps as well as emulsifiers and other usual additives in a carrier, which carrier is a mixture of at least one hydrocarbon and water and is present in the form of a water-in-oil dispersion. The invention also relates to the use of the release agent and to a method for producing same.</p> <p>(57) Zusammenfassung</p> <p>Trennmittel, das als trennwirksame Substanzen Öle, Wachse, Silikone und/oder Seifen enthält, sowie Emulgatoren und andere übliche Additive in einem Träger, wobei der Träger eine Mischung aus mindestens einem Kohlenwasserstoff und Wasser ist, wobei diese Mischung als Wasser-in-Öl-Dispersion vorliegt, dessen Verwendung sowie Verfahren zu dessen Herstellung.</p>		

PARTING AGENT, ITS USE AND PROCESS FOR ITS PRODUCTION

The invention relates to a separating or parting agent, which contains as parting-active substances oils, waxes, silicones and/or soaps, as well as optionally emulsifiers and other conventional additives, in a carrier, its use and process for the production thereof.

The manufacture of mouldings from polyurethane foam requires for easy, clean removal of polymerized foam mouldings from the metallic, wooden or plastic moulds, the treatment of the mould surfaces coming into contact with the foam-forming components or the polyurethane foam so-called parting agents. For this purpose the mould surfaces are provided with a uniform parting agent coating in order to produce a parting or separating film and for this purpose the prior art discloses several different spraying methods.

The at present industrially used parting agents for the release of mouldings conventionally contain, dispersed in a carrier, parting-active substances such as e.g. oils, waxes, silicones and/or soaps. Possible carriers are either organic solvents or water. The organic solvent and water not only serve as carriers for the parting-active substances and as solvents for further additives, but also for setting an optimum concentration, as adjuvants during wetting and flowing and during the formation of the parting agent film, as well as for influencing the polyurethane moulding surface. Further demands made on the carrier are economy, operational safety and environmental compatibility.

The greatly increased interest in environmental protection and the associated ever more stringent regulations have led to the aim of reducing to an acceptable minimum the use of volatile organic solvents. Thus, due to its unobjectionability with respect to health and environmental protection, over the last few years water has become of ever greater interest for use as a carrier or diluting medium for parting agents.

However, water as the carrier medium in parting agents for polyurethane foam mouldings suffers from a number of disadvantages requiring special adaptations (cf. H. Wochnowski, *Kunststoffe* 79/1989, 8, pp 680-683; H.H. Block, *Kunststoffe*, 79 (1989), 3, pp 214-242). In connection with the efforts to develop aqueous parting agents reference is also made to EP-A-164 501, EP-A-188 219 and EP-A-272 629.

The disadvantages of purely aqueous parting agent systems compared with parting agents based on organic solvents relate to contamination of the area round the moulds, the impossibility of cleaning the mould by melting the residue and consequently increased cleaning costs and (in many cases undesired) closed and in part greasy polyurethane moulding surfaces.

Thus, the problem of the present invention is to propose a novel parting agent, which overcomes the indicated disadvantages of the known, purely aqueous parting agents and which is simultaneously much more environmentally friendly than the hitherto known parting agent systems based on organic solvents.

According to the invention the problem is solved by a parting agent according to the preamble, in which the carrier is a mixture of at least one hydrocarbon and water, said mixture being in the form of a water-in-oil dispersion.

It is also preferable for the hydrocarbon or hydrocarbons to have a boiling point between 60 and 240°C.

The water proportion can be in the range 10 to 70 wt.%. Preferably the water proportion is max 60 wt.%.

The invention also relates to the parting agent according to the invention for the production of polyurethane (PUR) mouldings.

The invention also relates to a process for the production of the parting agent according to the invention, in which initially and separately a first mixture of water and optionally at least part of the surfactant and a second and optionally third mixture containing the hydrocarbon or hydrocarbons, the parting-active substances and the other additives are produced and subsequently the second and optionally third mixture are slowly dispersed in the first mixture.

Moreover, the second mixture essentially contains the hydrocarbon or hydrocarbons.

An essential feature of the newly developed hydrocarbon/water mixtures as the carrier medium for parting-active substances and whose action has been positively confirmed by corresponding tests, is that the parting agent system is in the form of a water-in-oil (W/O) dispersion, i.e. the water is surrounded by the hydrocarbon or hydrocarbons. The term "dispersion" is used in its widest sense as a system of several phases, whereof one is continuously dispersed (dispersant) and at least one further phase is finely dispersed therein (dispersed phase). In the present context this term applies in particular to suspensions, emulsions and microemulsions.

The hydrocarbon used for the present invention is in particular a substance

with a boiling point between 60 and 240°C, i.e. a hydrocarbon with approximately 5 to approximately 14 carbon atoms. It is obviously possible to also use the most varied mixtures of hydrocarbons, such as in particular commercially available white spirit or isoparaffin mixtures with a specific boiling point range.

A characteristic feature of the parting agent according to the invention is that it can be diluted with the hydrocarbon used as the solvent. As a result of the character as a water-in-oil system there is also a lower electrical conductivity.

Emulsifiers are necessary for producing the water-in-oil dispersions according to the invention. For this purpose it is possible to use the known anionic, cationic or nonionic surfactants employed in emulsifiers.

Whereas the conventional aqueous parting agent systems represent oil-in-water (O/W) dispersions, i.e. are water-dilutable and consequently have the aforementioned, known disadvantages, the emission-reduced hydrocarbon/water parting agent systems proposed by the invention are much more environmentally friendly as a result of their high water percentage than the known solvent-based systems (ecological advantage as a result of volatile organic solvent reduction). However, they also have mould release characteristics far superior to the hitherto known, aqueous parting agents and which reach the quality level known for solvent-based parting agents (reduced mould cleaning costs, longer cleaning cycles and positive influencing of the PUR surface).

The following examples 1 to 3 disclose parting agent formulations designed for different fields of use. Example 4 relates to a typical production process for a parting agent according to the invention.

Example 1

The parting agent with the composition given hereinafter is particularly intended for use in the field of semirigid polyurethane with an integral skin. A mixture of wax and silicone is used as the parting-active substance. The hydrocarbon mixture used is a commercially obtainable white spirit with a boiling point range between 145 and 160°C. The added catalyst, e.g. a tin catalyst, is used for improving the surface quality of the resulting polyurethane foam moulding.

4.6000% wax (mixture of hydrocarbon waxes in part containing metallic soap)
10.2000% silicone (mixture of polydimethyl siloxane, resin and oil)
0.7000% catalyst (di-n-butyl tin carboxylate)
0.1875% surfactant (phenol alkyl sulphonate)
1.3275% flatting agent, solubilizer (amorphous SiO₂, ethanol)
60.3850% white spirit
22.6000% water

Example 2

The parting agent formulated in the manner indicated hereinafter is specifically intended for use in the manufacture of PUR foam shoe soles. A mixture of silicone and paraffinic mineral oil is used as the parting-active substance. The hydrocarbon used according to the invention is an isoparaffin mixture with a boiling point range between 187 and 212°C.

12.0000% silicone (polydimethyl siloxane, resin)
28.0000% paraffinic mineral oil
0.5000% surfactant (NA-polyaldehyde carboxylate)
24.5000% isoparaffin mixture
35.0000% water

Example 3

The following parting agent is intended for use in the PUR cold flexible foam sector. Waxes are used as the parting-active substances. The hydrocarbon used according to the invention is an isoparaffin mixture with a boiling point range between 187 and 212°C.

6.5280% waxes (mixture of hydrocarbon waxes, in part containing metallic soap)
2.2600% surfactants, emulsifiers (silicon-glycol copolymer, nonionic emulsifier)
1.8796% lubricant, other additives (fatty amine, biocide)
64.6324% isoparaffin mixture
24.7000% water

Example 4

For the production of a parting agent in accordance with example 1 a first mixture of water and optionally the surfactant is produced in a first container. A second mixture is produced in a second container, the wax,

catalyst and remaining additives being mixed into the white spirit. The liquid silicone is placed in a third container.

Firstly the content of the first container, i.e. the first mixture of water and surfactant is homogenized by vigorous stirring. Then the content of the second container is slowly dispersed, accompanied by homogenization, in the first mixture in the first container. Then silicone is added from the third container and the mixture is again homogenized.

This makes it possible in an effective manner to produce the desired water-in-oil dispersion. Simultaneously the risks associated with the low conductivity due to electrostatic charging are effectively avoided. The resulting parting agent is suitable for use with known spraying processes without any limitation and leads to the aforementioned, excellent mould release characteristics.

The features of the invention disclosed in the above description and in the claims can be essential, both individually and in random combinations, to the implementation of the different embodiments of the invention.

CLAIMS

1. Parting agent containing as parting-active substances oil, waxes, silicones and/or soaps, as well as emulsifiers and other conventional additives, in a carrier, characterized in that the carrier is a mixture of at least one hydrocarbon and water, said mixture being in the form of a water-in-oil dispersion.
2. Parting agent according to claim 1, characterized in that the hydrocarbon or hydrocarbons have a boiling point between 60 and 240°C.
3. Parting agent according to claim 1 or 2, characterized in that the water proportion is in a range between 10 and 70 wt.%.
4. Parting agent according to claim 3, characterized in that the water proportion is max 60 wt.%.
5. Use of a parting agent according to one of the preceding claims for the production of polyurethane (PUR) mouldings.
6. Process for the production of a parting agent according to one of the claims 1 to 4, characterized in that initially and separately a first mixture of water and optionally at least part of the surfactant and a second and optionally third mixture, containing the hydrocarbon or hydrocarbons, the parting-active substances and the other additives are produced and subsequently the second and optionally third mixture is slowly dispersed in the first mixture.
7. Process according to claim 6, characterized in that the second mixture essentially contains the hydrocarbon or hydrocarbons.