1. Introduction

The paper relates to a repellent for dogs or cats that can be applied to a wall or fence. The paper indicates that the repellent should be stable over a longer period of time and should not be harmful to human beings and animals.

1.1. The prior art

Two documents are cited against the application both of which are novelty-destroying for claims 1 to 4 of the application. Both documents disclose a cyclohexylurea derivative embedded into a polymer matrix. D1 refers to the use of the composition as a dog repellent, while D2 focuses on the use of said composition as insect repellent.

1.2. The communication

Novelty objections are raised by the examiner in the communication against claims 1 to 4 on the basis of D1, and against claims 1 to 3 on the basis of D2. No explicit inventive step objection is raised. Moreover, a clarity objection is raised against claims 1 and 4. Claim 1 defines the compound by its result to be achieved and refers to the broad and unclear term “derivative”. Claim 4 includes the features “dog and cat repellent”, “polymer matrix”, “paint” and “ready-to spray dispersions”, which are considered ambiguous terms. Finally, the application is found to lack unity of invention, because the concept underlying the present application is already disclosed in D1. Examiner identified a first group of inventions, wherein each individual compound encompassed by general formula (I) forms one single invention, and a further invention covered by use claim 4. Nevertheless, all identified inventions have been searched and applicant is asked to select one of the inventions.
1.3. The letter from the applicant

With his letter the client proposes a set of claims addressing the objections raised by the examiner. In this set of claims, claim 1 is limited to a polymer matrix with cyclohexylurea derivative of formula (I), wherein R1 and R2 are further specified. In addition, claim 1 refers to paint or a ready to spray dispersion. New dependent claims 2 and 3 seek protection for two preferred individual compounds and a preferred amount of the cyclohexylurea in the polymer matrix. Use claim 4 is amended to refer to the paint or dispersion of the preceding claims.

The client does not specifically address the clarity and unity objections and expresses his view that the claims should also meet the requirements of inventive step. In addition, the client provides a further derivative in the letter, which derivative has superior effects and should be covered by the claims. The client mentions that there are no final results for the effectiveness for repelling dogs of the ready to spray dispersions.

Three of the amendments proposed by the client add subject-matter, contrary to Article 123(2) EPC. There is no basis in the application for the proviso that only one of residues R1 and R2 can be hydrogen. In claim 2, the first individual compound does not have any basis in the original application. Finally, the lower limit of 10% by weight of the cyclohexylurea derivative in the paint cannot be directly and unambiguously derived from the application as filed.

1.4. The expected solution

The solution to the paper is a limitation to a paint comprising a polymer matrix with a cyclohexylurea derivative of formula (I).

It is necessary to provide arguments demonstrating that the objections raised by the examiner have been overcome, provide basis for all the amendments made and explain why the subject-matter of the amended claims is now novel, inventive, clear and unified.
1.5. The marking scheme

The claims and the arguments are assessed separately. Therefore candidates who have provided very good arguments for the claims they have submitted can receive good marks for argumentation even if the claims receive few marks. It is not possible to award negative marks in any section of the marking sheet. Therefore if more marks need to be deducted under a heading than there are marks available 0 marks are awarded. No marks are available for formulating a letter to the client setting out the reasons why the client’s suggested claims were further amended.

2. Expected claims

A suitable wording for the amended claims is as follows:

1. Paint comprising a polymer matrix, in which a cyclohexylurea derivative of formula (I)

\[ \text{is embedded and wherein} \]

A is oxygen or sulphur, R is alkyl with 3 to 8 carbon atoms, cycloalkyl with 4 to 8 carbon atoms, hydrogen or halogen selected from the group consisting of chlorine, fluorine, iodine or bromine, R1 and R2 are equal or different and are selected from the group consisting of alkyl with 1 to 8 carbon atoms, cycloalkyl with 4 to 8 carbon atoms or hydrogen.

2. Paint according to claim 1, wherein the cyclohexylurea derivative has the formula

\[ \text{.} \]
3. Paint according to claim 1 or 2, wherein the amount of the cyclohexylurea derivative in the polymer matrix is between 15 and 25% by weight.

4. Use of the paint according to any one of claims 1 to 3 as repellent for dogs or cats.

3. Claim Amendments

A total of 30 marks are available for the amended set of claims. Drafting a large number of additional claims is not expected.

3.1. The independent claims (22 marks)

The expected independent claim 1 is worth 20 marks.

No marks are lost when the claim recites that the amount of the cyclohexylurea derivative contained in the polymer matrix is at most 25 wt%. Limitation to a cyclohexylurea content of 15 to 25 wt% in the polymer matrix results in a deduction of 3 marks.

In the light of the definition of paint in paragraph [08], first part, it is not necessary to specify the paint by introducing the features of the typical paint of paragraph [08], last part. However, no marks are deducted when the paint is defined in line with paragraph [08]. Limitation to certain amounts of polymer matrix in the paint results in a deduction of 3 marks. Defining the paint as coating material in liquid or paste form without indicating that the material is applied by brush or roller results in a deduction of 5 marks. Any further major limitation of the claims leads to a loss of 5 marks.

Minor limitations, e.g. recitation of microparticles in the claims, an indication of a property or characteristic of the paint (e.g. allowing for a control release of a repellent) or clarity issues, may result in a deduction of 2 marks each.

The limitation to cyclohexylurea derivatives that do not cover the compound mentioned in the letter of the applicant (for instance, a compound wherein A is oxygen, wherein R1 and R2 are equal or wherein R is an alkyl, cycloalkyl or hydrogen) results in a deduction of 15 marks. Equally, if the cyclohexylurea derivative of claim 1 does not cover the compound of example 1 (for instance, wherein A is only sulphur), 15 marks are lost.
10 marks are deducted if the claim contains added subject-matter (for example if formula (I) is amended in the form of a non-allowable intermediate generalisation). A claim which is not new, or which only refers to the dispersion or to one individual cyclohexylurea derivative receives no marks.

Use claim 5 based upon the original use claim 4 is worth 2 marks. 1 mark is deducted if the claim does not refer to cats. If the claim does not recite dogs, 2 marks are lost.

3.2. The dependent claims (8 marks)

3 marks are awarded for deleting the first derivative and keeping the second derivative of claim 2 in applicant’s letter. 3 marks are reserved for amending the weight percentage in claim 3 of applicant’s letter. Finally, 2 marks are available to make the dependent claims consistent with the main claim.

4. Arguments

A total of 70 marks are available for the arguments. The arguments are assessed on the basis of the actual set of claims submitted. Thus, for example, if additional claims are formulated, a full basis needs to be provided for all the claims.

4.1. Basis for the amendments (12 marks)

A reasoned basis has to be provided for all of the amendments. In order to obtain full marks it is necessary to identify all the amendments made in the set of claims to be filed as compared to the original set of claims. The support needs to be provided irrespective of whether the amendment was proposed in the client’s letter or is a further amendment to the set of claims proposed by the client. Amendments proposed by the client but not included in the set of claims submitted should not be discussed.

In addition, the passages in the original application forming the basis for the amendments need to be identified. If only a series of paragraph numbers are cited a maximum of 6 marks are awarded. No marks are available for referring to the client's
letter or to the set of claims proposed by the client as the basis for the amendments. Arguments need to be provided if features have been combined from different parts of the application as filed. Similarly, if the wording used in the application as filed is modified, if a feature is taken from an example or if features are deleted from a claim, detailed arguments will need to be provided in support of these amendments. Arguments for a set of claims that contain added subject-matter and therefore an incorrect argument for an amendment can only be awarded a maximum of 8 marks. Provision of arguments with an incorrect basis (for example by referring to the wrong paragraph) leads to a loss of 2 marks.

The arguments for the expected set of claims can be worded as follows:

Claim 1 has been amended to recite a paint comprising the polymer matrix with a cyclohexylurea derivative of formula (I). This amendment is based on original claims 2 and 3. In addition, the functional feature of claim 1 was deleted. Paragraph [04] directly and unambiguously discloses that the cyclohexylurea derivatives according to the present invention deter at least 50% of animals from urinating on an object for a one-year period. The claim is now limited to a specific class of compounds having inherently this function.

As original dependent claim 3 referred to claim 2, the subject-matter of both claims can be combined.

Paint comprising the polymer matrix with the derivatives of the invention is mentioned at paragraph [06] in combination with paragraph [07], first sentence. It is also mentioned at paragraph [07] that the polymer matrix with the derivatives is formulated as paint. It is not necessary to limit to a certain amount of polymer matrix due to the term “preferred embodiment”. The amendment to claim 2 is based on the most preferred embodiment of paragraph [05] and is also mentioned in example 1.

Claim 3 is amended to recite the preferred weight percentage according to paragraph [09].

4.2 Clarity (10 marks)

The letter needs to explain how the clarity objections raised in the communication have been overcome. The marks for the expected set of claims are awarded if it is stated that the clarity objection with regard to the term “derivative” has been overcome by structurally defining the cyclohexylurea derivative in claim 1. The
expression “dog and cat repellent” is now clearly defined by the reference to the cyclohexylurea derivatives of claims 1 to 3. The term “ready to spray dispersion” is deleted from the claims. Furthermore, it should be argued that the term “polymer matrix” is clear from the description at paragraph [07]. 6 marks are available for these arguments.

With regard to the term “paint”, reference should be made to paragraph [08], wherein a definition of the general term “paint” is provided and an example is given; it is thus not necessary to specify the compounds of the paint. This line of argument is worth 4 marks.

4.3. Novelty (12 marks)

The novelty of the claims also has to be discussed. Marks are awarded for providing a complete technical analysis of the prior art, identifying all the differences between the prior art and the subject-matter of the claims filed as well as for arguing why the claims are novel. 4 marks are reserved for summarising D1 and D2. The summary should mention all the features of these documents that are relevant for the discussion of novelty and inventive step. Arguing that the claimed subject-matter is novel with respect to D1 is worth 2 marks. It is necessary to explain in these arguments that D1 does not refer to paint. The arguments for novelty with respect to D2 are worth up to 6 marks. It should be stressed that D2 discloses a ready-to spray dispersion that cannot be interpreted as a paint considering how a skilled person would understand said term in the light of the application and his general knowledge. Reference should be made to paragraph [08] of the present application.

4.4. Inventive step (28 marks)

The inventive step of the proposed set of claims has to be argued on the basis of the problem-solution approach.

The first step is to identify the closest state of the art (4 marks). D1 and D2 both relate to the use of cyclohexylurea derivatives as repellents and thus both need to be discussed. D1 however explicitly relates to the use of cyclohexylurea derivatives as dog repellents. D1 is thus the more plausible starting point for the skilled person. Candidates that identified D2 as the closest prior art on the basis that the process
disclosed in D2 has more features in common with the claimed compounds than that of D1 and expresses the idea of using less toxic compounds could obtain a maximum of 2 marks. The marks under this heading are awarded for providing reasons why the particular document is selected rather than the other one.

The difference or differences have then to be identified, the technical effects associated with the differences and the evidence for the effects should be identified (3 marks) and the problem as well as the solution has to be defined (5 marks). The disclosure of D1 differs from that claimed in that the polymer matrix comprising the cyclohexylurea derivatives is formulated as paint.

The application contains the example 3, wherein a wall in a walking area for dogs was painted with the paint according to the invention. It is concluded that the paint is effective over a period of 1 year, even when the paint is exposed to rain and wind. A reasoned line of arguments is worth up to 7 marks. The problem in view of D1 can therefore be defined as providing an improved dog repellent that is effective over a period of 1 year when exposed to rain and wind.

It is finally necessary to present arguments explaining why the claimed subject-matter is not obvious (9 marks). It is necessary to argue why the claimed subject-matter is not obvious either on the basis of D1 alone or a combination of D1 and D2.

It should be stressed that D1 does not provide any reason to use paint. D1 cannot provide any hint that the use of paint would have a long-lasting repellent effect even when exposed to rain and wind. D1 says that the anti-repellent activity of cyclohexylurea derivatives is drastically reduced when exposed to wind and rain. In respect of a combination of D1 and D2 it can be argued that D2 mentions that the cyclohexylurea derivatives are not toxic to animals and at most hints that dogs do not come close to a wall treated with a ready to spray dispersion. It should therefore be concluded that the claimed subject-matter involves an inventive step.

A few very good candidates argued why the paint is also effective as cat repellent. Although the application does not provide a working example directed to a cat repellent, it is noted that paragraph [06] of D2 refers to cyclohexylurea derivatives having the same effects on dogs and cats. In view of D2, the extension of the scope of the use claim towards cats should also be credible and inventive.
4.5. Unity of invention (8 marks)

It is necessary to discuss why the amendments to the claims obviate the objections raised against unity of invention. Mentioning that the unity objections are overcome by amending the claims is worth 4 marks. The application relates to one group of inventions only that is linked by the following general inventive concept: paint comprising polymer matrix comprising the cyclohexylurea derivatives of formula (I). Identifying the concept and explaining that the concept is new and inventive over D1 and D2 as detailed in the above sections regarding novelty and inventive step is worth 4 marks. The claims have been fully searched.

Claims:

1. Paint comprising a polymer matrix, in which a cyclohexylurea derivative of formula (I)

\[
\begin{align*}
\text{R} & \quad \text{NH} \quad \text{A} \quad \text{N} \quad \text{R}^1 \\
\end{align*}
\]

is embedded and wherein
A is oxygen or sulphur,
R is alkyl with 3 to 8 carbon atoms, cycloalkyl with 4 to 8 carbon atoms, hydrogen or halogen selected from the group consisting of chlorine, fluorine, iodine or bromine,
R1 and R2 are equal or different and are selected from the group consisting of alkyl with 1 to 8 carbon atoms, cycloalkyl with 4 to 8 carbon atoms or hydrogen.

2. Paint according to claim 1, wherein the cyclohexylurea derivative has the formula

\[
\begin{align*}
\text{R}_2 \quad \text{NH} \quad \text{O} \quad \text{CH}_3 \\
\end{align*}
\]

3. Paint according to claim 1 or 2, wherein the amount of the cyclohexylurea derivative in the polymer matrix is between 15 and 25% by weight.

4. Use of the paint according to any one of claims 1 to 3 as repellent for dogs or cats.
## EXAMINATION COMMITTEE I

### Paper B (Chemistry) - 2016 - Marking Sheet

<table>
<thead>
<tr>
<th>Category</th>
<th>Maximum possible</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Claims</strong></td>
<td></td>
</tr>
<tr>
<td>Independent claim</td>
<td>22</td>
</tr>
<tr>
<td>Dependent claim</td>
<td>8</td>
</tr>
<tr>
<td><strong>Arguments</strong></td>
<td></td>
</tr>
<tr>
<td>Amendments</td>
<td>12</td>
</tr>
<tr>
<td>Clarity</td>
<td>10</td>
</tr>
<tr>
<td>Novelty</td>
<td>12</td>
</tr>
<tr>
<td>Inventive Step</td>
<td>28</td>
</tr>
<tr>
<td>Unity</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
</tr>
</tbody>
</table>