
Candidate's answer

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European Patent Office
D-80298 Munich
Germany

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Dear Sirs,

European Patent Application Number: _____

In response to the recent communication pursuant to Article 96(2) EPC and Rule 51(2) EPC, a new set of claims is filed herewith.

Amendments

The preamble of claim 1 is based upon D1.

The characterising portion of claim 1 is based upon claims 1, 2 and 3 as previously on file and page 3 lines 16 and 17 of the description. It would be apparent to a person skilled in the art that the heating means must be arranged so that it can heat the intumescent material regardless of whether the heating element is being retro-fitted or installed with a new seal. Further basis for this amendment can be found at page 2 lines 25 and 26 of the description.

The dependent claims find basis at the following page/line references of the application on file:

- Claim 2 page 1 line 19-20 and page 1 line 16
- Claim 3 page 2 line 17
- Claim 4 page 2 line 18
- Claim 5 page 2 line 25
- Claim 6 page 3 line 3
- Claim 7 page 3 line 3
- Claim 8 page 3 lines 5-10
- Claim 9 claim 4 as previously on file
- Claim 10 page 3 lines 13-17.

Claim 8 recites a remote means for activating the seal, basis for this lies with reference to the fire detector disclosed in the description.

Claim 9 is a clarified version of claim 4 as previously on file.

Claim 10 is a new independent method claim.

The preamble of claim 10 is based upon D1.

The characterising portion of claim 10 is based upon page 3 lines 13 to 17 of the description as filed.

Novelty

Both independent claims 1 and 10 recite an intumescent seal and an electrical heating means.

D1 is cited in the present application; this does not disclose an electrical heating means. D1 relies on the heat from a fire to activate the intumescent material (page 1 lines 14-15). Claims 1 and 10 are therefore novel over D1.

D2 discloses a rubber tube door seal; this discloses neither an intumescent material nor an electrical heating means. The door is sealed by inflating a rubber tube (page 1 line 13). Claims 1 and 10 are therefore novel over D2

D3 describes a new kind of frame installation for doors and windows. D3 does not disclose an electrical heating means. D3 discloses heating an intumescent material by a chemical heating agent (page 1 line 10). Claims 1 and 10 are therefore novel over D3.

D4 is a novelty only citation. D4 discloses a prestressed elastic strip which is released by the heating of an adhesive layer by a resistive heating wire (page 1 lines 4-5, page 1 lines 15-16). D4 does not disclose an intumescent material. Claims 1 and 10 are therefore novel over D4.

The dependent claims are novel by virtue of their dependence on a novel independent claim, at least.

Inventive Step

The problem and solution approach will be applied (Guidelines C-IV 9.8).

Closest Prior Art

Assessed from the skilled person's point of view on the day before the priority date of the claimed invention, D1 is considered to be the closest prior art document.

This document is referenced in the present application as disclosing a sealing element made of intumescent material (page 1 line 14).

It is submitted that this document constitutes the most promising starting point for an obvious development leading to the invention.

D1 is directed towards a similar purpose as the present invention, namely of providing an intumescent door seal to prevent the spread of smoke in the event of fire (present application: page 1 lines 5-6, D1: page 1 lines 13-14).

Also, D1 appears to require the least structural and functional modification to arrive at the claimed invention.

D1 discloses a sealing element comprising intumescent material as claimed. D1 discloses: 'an intumescent seal' at page 1 line 7.

Objective Technical Problem

D1 does not disclose an electrical heating means arranged so that it can heat the intumescent material of the sealing element, as claimed. This is the technical feature which distinguishes the present invention from D1.

Advantageously, the technical effect of this distinguishing feature is that a door may be sealed before a fire reaches it, preventing any smoke or dangerous gases passing through the gap as these spread ahead of the fire.

The underlying objective technical problem solved by the present invention in view of D1 is to provide a door seal which can be activated before a fire reaches it.

Inventive Step Submissions

D1 alone

D1 is concerned with an intumescent door seal. D1 does not disclose a means for heating the intumescent seal in advance of a fire reaching it, i.e. an electrical heating means of the present invention.

If a skilled person were seeking to achieve a door seal which can be activated before a fire reaches it, then when studying the teaching of D1 alone, there is nothing to suggest such a feature of the present invention. Claims 1 and 10 are thus inventive over D1 alone.

D2 alone

D2 presents an alternative solution to the problem of providing a door seal which can be activated before a fire reaches it. The solution presented by D2 is a pump which inflates rubber tubes around the door frame.

This solution is completely different to that of the present invention and is simply not an obvious starting point when seeking to arrive at the present invention. For this reason D2 cannot be considered the closest prior art.

Although D2 presents a solution to the objective technical problem outlined above, D1 presents a different solution to this problem and for this reason the present invention is inventive over D2 when taken alone.

D1 and D2

D1 discloses an intumescent door seal; D2 discloses a door seal comprising an inflated rubber tube. A skilled person seeking to achieve a door seal which can be activated before a fire reaches it, starting with D1, would not have been motivated to consider the teaching of D2. There is no incentive to combine these documents.

D1 and D2 disclose entirely different solutions to the door sealing problem using entirely different principles (D1 – intumescent materials; D2 – inflatable tube). The disclosures of these documents are not combinable.

D2 does not disclose an electrical heating means. Rather, D2 discloses a pneumatic pump. Because of this, the skilled person would not see this teaching as relevant to the solution presented in claim 1, namely an electrically heated intumescent seal. There is therefore no incentive for the skilled person seeking to achieve a door seal which can be activated before a fire reaches it, starting from D1, to consider modifying D1 by taking this feature from D2.

Even if the skilled person were to attempt to combine D1 and D2, he would not arrive at the present invention – neither document discloses a heating element.

D1 and D3

D1 discloses an intumescent door seal; D3 discloses a more easily installed frame for a door or window. A skilled person seeking to achieve a door seal which can be activated before a fire reaches it, starting with D1, would not have been motivated to consider the teaching of D3. There is no incentive to combine these documents.

D1 and D3 are in completely different technical fields. Indeed, D3 discloses the use of an intumescent material for a completely different purpose. It is not apparent what would have motivated the skilled person to combine these two documents.

However, if a skilled person were to combine D1 and D3, he would arrive at an intumescent door seal having capsules with chemical heating agents. Such an apparatus would likely be highly impractical for long-term building installation.

Accordingly, claim 1 (a seal) and claim 10 (a method for improving an intumescent seal) are inventive over D3 combined with D1.

The dependent claims are inventive by virtue of their dependence on an inventive independent claim at least.

Referring to the communication paragraphs in turn:

(1) to (8): it is submitted that the amended claims are novel and inventive for the reasons given above.

(6) sub-paragraph 1: claim 9 (based on claim 4) has been amended to clearly define the scope of protection sought in accordance with Art. 84 EPC.

(5) sub-paragraph 2: the examiner contends that the seal of D1 can be activated by a suitably placed electrical heating means. It is submitted that the relevant test is “whether there is any teaching in the prior art as a whole that would (not simply could, but would) have prompted the skilled person to modify or adapt the closest prior art ...” Guidelines C-IV 9.8.3. There is nothing in the prior art as a whole that would have motivated the person skilled in the art to modify D1 to arrive at the present invention.

It is therefore submitted that the new claims are novel and inventive. The examiner is asked to reconsider the application favourably.

The description will be amended into conformity with the claims once the examiner acknowledges the allowability of the claims.

All amendments are made without the abandonment of subject matter.

Merely as a precaution, oral proceedings under Article 116 EPC are requested in the event that the Examining Division is minded to refuse this application.

Please stamp and return the enclosed Form 1037 to acknowledge receipt of this letter with its enclosures.

Signed

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Authorised Representative

Claims

1. A seal (1) comprising a sealing element (3) for sealing a gap wherein the sealing element (3) comprises intumescent material, the seal (1) characterised by:
 an electrical heating means (2) arranged so that it can heat the intumescent material of the sealing element (3).
2. The seal (1) of claim 1, wherein the electrical heating means (2) is operable to heat the sealing element (3) to a temperature exceeding the threshold temperature of the intumescent material of the sealing element (3).
3. The seal (1) of claim 1 or 2, wherein the electrical heating means (2) is embedded in the sealing element (3).
4. The seal (1) of claim 1 or 2, wherein the electrical heating means (2) is arranged adjacent the sealing element (3).
5. The seal (1) of any preceding claim, wherein the electrical heating means (2) comprises a resistive heating wire.
6. The seal (1) of any one of claims 1 to 4, wherein the electrical heating means (2) comprises a resistive foil.
7. The seal (1) of any one of claims 1 to 4, wherein the electrical heating means comprises a resistive paint.
8. The seal (1) of any preceding claim, wherein the seal (1) is activated by a remote means.

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9. A fire protection system (7) comprising:
a seal (1) according to any preceding claim;
a control unit (9); and
at least one fire detector (8);
wherein the seal (1) is activated by the control unit (9) in response to a signal from the at least one fire detector (8).
10. A method for improving an intumescent seal (3), said method characterised by adding an electrical heating means (2) to the intumescent seal (3), wherein the electrical heating means (2) is arranged so that it can heat the intumescent seal (3).