Intellectual Property Office

BL O/559/20

10 November 2020

PATENTS ACT 1977

APPLICANT	Intumescent Systems Limited
ISSUE	Whether patent application GB1413106.4 complies with section 1(1)(b) of the Patents Act 1977
HEARING OFFICER	Phil Thorpe

DECISION

Introduction

1 Patent application GB1413106.4 entitled "Air Venting Apparatus" was filed on 27th July 2014. It was subsequently published as GB 2528491 A on 27th January 2016.

2 Despite several rounds of correspondence between the examiner and the applicant's attorney, and amendments to the claims, the applicant was unable to satisfy the examiner that the application met the requirements of the Patents Act 1977 (the Act). In particular, the examiner was not satisfied that the claimed invention involves an inventive step.

3 The matter subsequently came before me for a decision on the papers.

The patent

4 The patent relates to air venting apparatus. More particular and with reference to the figures provided in the application and shown below, the invention comprises of an air vent formed of two tubular elements 1,7 in close fitting telescopic engagement with each other, each element including a perforated end plate 3,9. In use a hole is made in a wall and the two tubular elements are slid in from opposite sides to provide a flow path for the air. The inner surface of one of the tubular elements 7 is coated with a layer 17 of a graphite-based intumescent material which expands rapidly in the event of a fire occurring to fill completely the interior of the element.

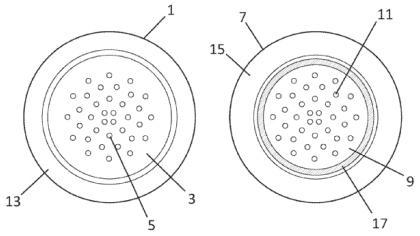


Fig. 1A Fig. 1B

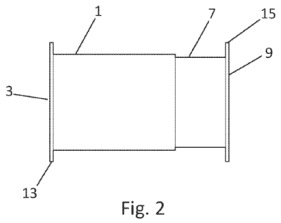


Fig. 2

5 The latest claims filed on 15th July 2020 include one independent claim which reads as follows:

> Air venting apparatus for location within a through opening of a wall, door or ceiling, the apparatus comprising an outer housing having a generally tubular section which includes at one end a perforated end plate of greater diameter than that of the tubular section, and an inner housing slidably mounted within the tubular section of the outer housing and coated on its inner surface with a layer of graphite based intumescent material, said inner housing including at its end remote from the outer housing a perforated end plate of larger diameter than that of the inner housing.

The Law

6 Section 1(1) states (with added emphasis):

> *A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say –*
>
> *(a) the invention is new;*
>
> *(b) **it involves an inventive step**;*
>
> *(c) it is capable of industrial application;*
>
> *(d) the grant of a patent for it is not excluded by subsections (2) and (3) or section 4A below;*

7 Section 3 then sets out how the presence of an inventive step is determined. It says:

> *An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding section 2(3) above).*

Determination of inventive step

8 In *SABAF SpA v MFI Furniture Centres Ltd*[1], Lord Hoffmann held that before you can ask whether the invention involves an inventive step, you first have to decide what the invention is. In particular, the first step is to decide whether you are dealing with one invention or, for the purposes of section 3, two or more inventions. If two integers interact upon each other, if there is synergy between them, then they constitute a single invention having a combined effect and one applies section 3 to the idea of combining them. But if each integer performs its own proper function independently of any of the others, and the claim is a mere aggregation or juxtaposition of features, then each is, for the purposes of section 3, a separate invention. The combination of a series of known or obvious features, each playing its usual part in the final entity, is a matter of design or mere collocation, not of invention, and so is objectionable under section 3. Lord Hoffmann noted that:

> "If the two integers interact upon each other, if there is synergy between them, they constitute a single invention having a combined effect and one applies section 3 to the idea of combining them. If each integer "performs its own proper function independently of any of the others", then each is for the purposes of section 3 a separate invention and it has to be applied to each one separately."

9 Further guidance on this can be found in the EPO Technical Board of Appeal decision in T 1054/05 where it was noted that:

> "Two features interact synergistically if their functions are interrelated and lead to an additional effect that goes beyond the sum of the effects of each feature taken in isolation. It is not enough that the features solve the same technical problem or that their effects are of the same kind and add up to an increased but otherwise unchanged effect."

10 The examiner has maintained that there is no synergistic relationship between the various features of the invention as claimed. He notes that each of the following appears to be performing its own proper function separately and does not appear to be unexpectedly influencing or being influenced by any of the others:

1. The telescopic nature of the inner and outer sliding housings that enable the length of the duct to be tailored to the width of the wall

2. The perforated end plates of larger diameter than the housings

3. The intumescent coating on the inner surface of the inner housing that expands in the event of a fire.

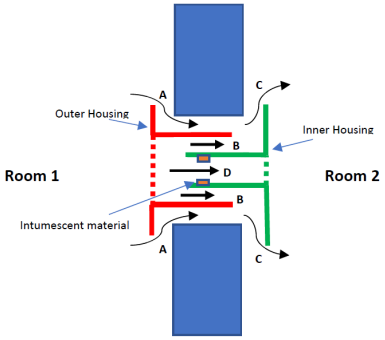
11 The applicant however argues that these features all contribute to ensure that fire within a building is effectively contained and is unable to spread via the vent to an adjacent room. It notes firstly that the length of the vent needs to be variable to ensure when fitted it matches precisely the width of the wall. Secondly the through passageway of the vent needs to close immediately in response to the presence of smoke and flames. And thirdly the ends of the vent need to be shaped to prevent flames travelling through the annular space between the outer surface of the vent and the adjacent hole surface entering the adjoining room.

---

[1] *SABAF SpA v MFI Furniture Centres Ltd* [2004] UKHL 45

12 The applicant contends that without all of these features the effectiveness of the claimed apparatus would be seriously diminished.

13 I explore these arguments further with the following diagram that I have produced:



14 Fire or smoke can travel from room 1 to room 2 either through the centre of the vent D or via any opening C between the endplate of the inner housing and the wall.

15 Although it is not as clearly brought out in the amended claim as it was in the claims as filed, the function of the intumescent material is to completely close off passage D. The application as filed is however less clear on the need to seal opening C. It does suggest that the inner housing is a close fit with the outer housing and that the outer housing defines a close fit within the through hole. This would suggest that the size of passages A and B is not great. The application does not indicate what function is provided by having the end plates of a larger diameter than the respective housing. It does not explicitly disclose, as the applicant is now arguing, that the end plates are “firmly located” against the wall to in effect seal opening C. It is not unusual for end plates to be larger than the opening for cosmetic purposes. I would further note that the application as filed says little indeed about how the vent is secured in position.

16 I am however prepared to accept that having a tight fit between the inner and outer housings, and having end plates larger than the size of the opening will allow the length of the vent to be adjusted and for the two parts of the vent to be held in close contact with the wall and that this will reduce in particular the size of passages A, B and C. This will in turn reduce the amount of flame or smoke that can pass through these passages. These two features have a combined effect that constitutes a single invention. The question is then whether these features also combine in the same way with the feature of having intumescent coating on the inner surface of the inner housing. I accept that the vent would provide no fire resistance without this feature and that a vent with all three of these features has more fire resistance than one lacking any of these features. But is that enough for them to be considered as a single invention?

17 The patent in issue in *Sabaf* related to a burner for gas cookers and hobs. An object of the invention was said to be to provide a gas burner of very low height which can therefore be used with advantage in hobs which must be flat. This was to be achieved by having two features, the air intake and a radial venturi effect, taking place above instead of below the hob. Lord Hoffman noted in respect of both these features that:

> *"There was no item of prior art which taught both. But neither made the other function any differently or produced any combined effect except that each contributed separately to produce a slim hob which was suitable for a work surface over a cupboard."*

18 Having set out the need to consider whether there were one or two inventions, he concluded that Laddie J at first instance had:

> "… correctly applied the relevant principles at each stage. He found that taking the air above the hob and having a radial Venturi had no effect upon each other and that he was therefore dealing with two alleged inventions, each of which had to pass the test laid down in section 3. He identified the inventive step in each. He asked himself what in each case were the differences between the relevant prior art and the invention. He found that there were virtually none. He concluded that it would have required no invention on the part of the skilled man armed with common general knowledge in the art to design a product in accordance with the alleged invention. In other words, he applied section 3 according to the Windsurfing structure to each of the features alleged to constitute the invention."

19 The fact that both features contributed to making the hob thinner was not enough to make them one invention. Lord Hoffman when considering the overall approach to cases such as this, gave a further example when he noted:

> "Two inventions do not become one invention because they are included in the same hardware. A compact motor car may contain many inventions, each operating independently of each other but all designed to contribute to the overall goal of having a compact car. That does not make the car a single invention."

20 Having carefully considered the arguments of the applicant, I have concluded that the intumescent material, whilst contributing to the overall ability of the vent to prevent the passage of fire or smoke, does not interact with the other features, namely the telescopic nature of the housings and the larger end plates, to make the combination a single invention. If for example the expansion of the intumescent material had contributed to the sealing of the passages between the housings or between at least on the end plates and the wall, then my conclusion might have been different. However, there is simply no suggestion of this. Rather the sole function of the intumescent material is to seal the passageway within one of the housings. Hence the patent here relates to two separate inventions:

1) The telescopic nature of the inner and outer sliding housings that enable the length of the duct to be tailored to the width of the wall coupled with the perforated end plates of larger diameter than the housings

2) The intumescent coating on the inner surface of the inner housing of the air venting apparatus that expands in the event of a fire.

21 Following *SABAF* I therefore need to apply section 3 to each of the features independently.

Assessing inventive step

22 It is well-established that the approach to adopt when assessing whether an invention involves an inventive step is to work through the steps set out by the Court of Appeal in *Windsurfing*[2] and restated by that Court in *Pozzoli*[3]. These steps are:

> *(1)(a) Identify the notional "person skilled in the art"*
>
> *(1)(b) Identify the relevant common general knowledge of that person;*
>
> *(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;*
>
> *(3) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed;*
>
> *(4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?*

23 Nothing has really been said by either the applicant nor the examiner about the identity or common general knowledge of the skilled person. This is not surprising since the focus of their exchanges was on the question of whether the application involved more than one invention. Ultimately, I do not believe anything really turns on the nature and knowledge of the skilled person however for completeness I would suggest the skilled person for the purposes of the first invention is a designer of venting apparatus.

24 I have already identified the first invention as:

> The telescopic nature of the inner and outer sliding housings that enable the length of the duct to be tailored to the width of the wall coupled with the perforated end plates of larger diameter than the housings.

25 I would make one observation here on the meaning of "perforated end plates". The claims as originally filed referred merely to grills. The claims were however amended in an attempt I believe to better distinguish them from the fixed louvre grill shown in D1, which I discuss below, by introducing the requirement that the end plates are perforated. The application does not refer to any particular advantages of having a perforated end plate but rather notes that alternative embodiments of the invention may have grill openings which are "square, elongate, or other shape."

26 The examiner relies on five pieces of prior art which he and the applicant refer to as D1 to D5 and I will use that terminology here. Of relevance to the inventiveness of the first invention are documents D1 and D5.

27 D1 is patent CH566470 which was published on 15th September 1975. This document discloses a vent having telescopically mounted inter-sliding tubular sections (12,13) which enable the duct length to be adjusted. At one end of the duct is a one-way hinging flap (15) duct which prevents the ingress of rain. At the other

---

[2] *Windsurfing International Inc. v Tabur* Marine (Great Britain) Ltd [1985] RPC 59
[3] *Pozzoli SpA v BDMO SA* [2007] EWCA Civ 588, [2007] FSR 37

end is a fixed louvred grill. The grill has a flange around its perimeter which is larger than the tubular sections (12,13).

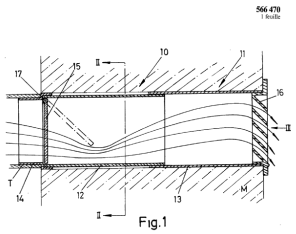


Fig.1

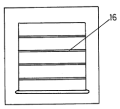


Fig. 3

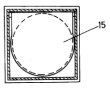


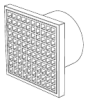
Fig.2

28 D5 is a catalogue produced by Manrose Manufacturing Ltd. Page 7 of the catalogue indicates it was published on 1st September 2012. The examiner argues that the catalogue:

> "provides a good selection of examples of products well-known to the skilled addressee. Pages 98-100 provide examples of grilles and covers intended to be fitted on each end of ducting. Pages 101-107 provide examples of ducting available to the skilled addressee, including a telescopic assembly."

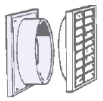
29 The grills disclosed include the following:

EGG CRATE GRILLE
Round Spigot - External Wall Grille



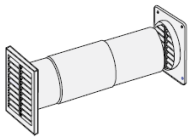
Cat. No.	Description	Size
1145L	140 x 140mm Grille - 100mmØ Spigot	100mm/4"
1147L	160 x 160mm Grille - 125mmØ Spigot	125mm/5"
1148L	180 x 180mm Grille - 150mmØ Spigot	150mm/6"

FIXED LOUVRE GRILLE
Round Spigot - External Wall Grille

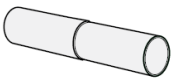


Cat. No.	Description	Size
1151	140 x 140mm grille - 100mmØ Spigot	100mm/4"
1170L	160 x 160mm grille - 125mmØ Spigot	125mm/5"
1190L	180 x 180mm grille - 150mmØ Spigot	150mm/6"

with the catelogue also disclosing the following telescopic assemblies:



TELESCOPIC ASSEMBLY
Round Pipe Telescopic Assembly



Cat. No.	Description	Size
TPIPE4	250mm to 450mm	100mm/4"
TPIPE5	250mm to 450mm	120mm/5"
TPIPE6	250mm to 450mm	150mm/6"

TELESCOPIC RETURN AIR BOX SET
With Fixed Grille

Cat. No.	Description	Size
7116	Round Pipe 250mm to 450mm	100mm/4"
7516	Round Pipe 250mm to 450mm	120mm/5"
7616	Round Pipe 250mm to 450mm	150mm/6"

30 The second of these telescopic arrangements is shown on page 110 of the catalogue which is outside of the page range specifically referred to by the examiner above however these were given as examples only. I am content that the applicant would have noted this arrangement and had an opportunity to respond to it.

31 The applicant's response to these documents is that neither discloses that the tubular sections of both inner and outer housings include a perforated end plate of larger diameter than the respective tubular section and a coating of intumescent material applied to the inner surface of the inner housing.

32 Given my finding in respect of the number of inventions, the absence of the intumescent material applied to the inner surface of the inner housing is not relevant to the consideration of the obviousness of invention 1. Rather what differences exist between in particular D5, and the inventive concept of the first invention is that D5 does not disclose explicitly a single arrangement showing telescopic inner and outer housings with perforated end plates at each end which are of larger diameter than the housings. Rather it discloses each of these features as separate components or as an assembly with what appears to be three housings. However, I am in no doubt that the skilled person would readily appreciate that the two-piece telescopic assembly could be combined with for example the egg crate grills to provide an arrangement having all the features of the first invention. On that basis I am satisfied that the first invention does not involve an inventive step having regard to the disclosure of D5.

33 I turn now to the second invention - the intumescent coating on the inner surface of the inner housing that expands in the event of a fire. Neither the applicant nor the examiner has considered the nature of the skilled person. I think it is reasonable again to consider the skilled person for the purposes of the second invention to be a designer of venting apparatus. I would however go further to suggest that the designer would also seek advice from someone with knowledge of fire protection techniques within the building industry given the problem that is being considered.

34 The examiner has suggested that the use of intumescent material to stop the spread of fires is well known. He has sought to demonstrate this by referring to two documents, D3 and D4.

35 Document D3 is a publication entitled "Passive Fire Protection" produced by the Fire Safety Advice Centre. Page 4 of the document provides a "Last updated" date of January 2nd, 2013. The date of publication has not been challenged by the applicant. The document discusses the use of passive fire protection (PFP) to contain or slow the spread of fires in buildings. It notes:

> There are two main types of opening that could compromise the integrity of a fire resistant structure: openings for pipes (10.5); and ventilation ducts, flues, etc. (10.9). At 10.17, additional provisions in respect of fire-stopping are detailed as follows:
>
> 1. joints between fire-separating elements should be fire-stopped;
> 2. all openings for pipes, ducts, conduits or cables to pass through any part of a fire-separating element should be:
>
> a) kept as few in number as possible; and
> b) kept as small as practicable; and
> c) fire-stopped (which, in the case of a pipe or duct, should allow thermal movement).
>
> ….. The role of PFP is to seal the gaps these penetrations create should the worst happen and fire break out. All products designed to fulfil this criteria are fire rated, i.e. certified to resist fire for a specified length of time, which can be anything from 30 minutes to 4 hours. They all include an intumescent material, which remains dormant, or passive, during normal conditions but swells to many times its original size when exposed to the heat of a blaze.

> … The hot gases of a blaze can also move swiftly around a building, undetected at first, for example through air conditioning ducts. Intumescent air transfer grilles, which are typically 30 or 60 minute fire rated, allow air to circulate freely around a building under normal conditions, but the intumescent material swells and creates a barrier to restrict the passage of hot gases in a fire situation. They are suitable for use with both fire rated doors and compartment walls."

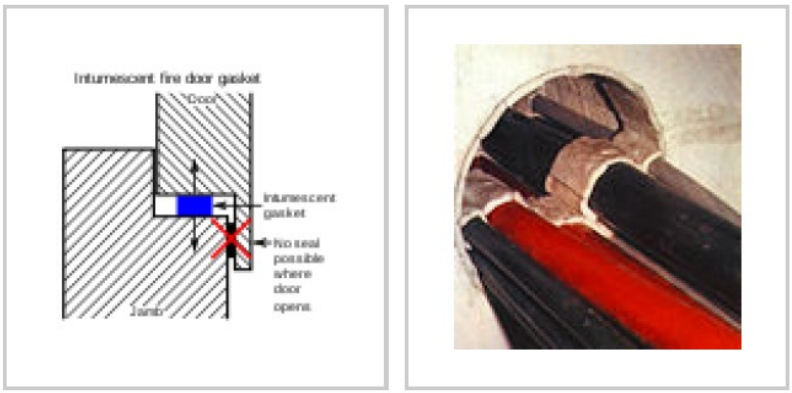
36 The document also refers to:

> **"Intumescent pipe wraps and collars** are designed for use on plastic pipes that pass through masonry floors and walls; the intumescent material expands inwards in a fire situation to squeeze the collapsing pipe until the opening is completely sealed."

37 Document D4 is old version of a Wikipedia page entitled "Intumescent". The date on the document is 28th May 2013 and this again has not been challenged by the applicant. The document notes that:

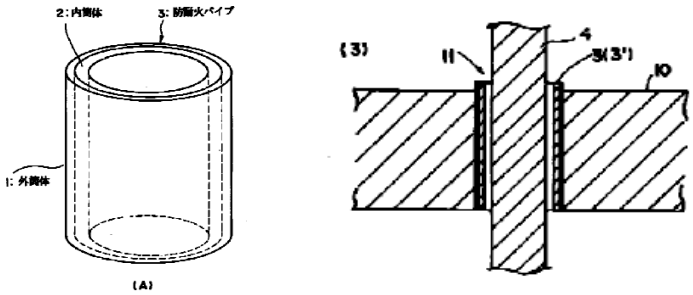
> "Intumescents are used to achieve passive fire protection for such applications as firestopping, fireproofing, gasketing and window casings. Such applications are relevant for buildings, offshore constructions, ships and aircraft."

38 Several examples of the use of intumescent material to fireproof structures are disclosed. These include the use of intumescent material as a door gasket and also intumescent putty in a cable penetration firestop.



39 The applicant accepts that intumescent materials have been available for some considerable time for use in fire stopping applications. It notes that many of its own products rely on the presence of intumescent materials for their effectiveness. I am therefore satisfied that the use of intumescent material for fire proofing would have formed part of the common general knowledge of the skilled person.

40 The prior art on which the examiner has based his inventive step objection in respect of the second invention is D2 which is Japanese patent JPH1119242. This was published on 26th January 1997 and discloses a fireproof pipe 3 having coaxial outer and inner cylinders wherein the inner cylinder is formed of a thermal expansible material which in the event of a fire expands to block any gap between the pipe and the member 4 extending through the pipe.



41 The description refers to a variety of penetrating members including air-conditioning ducts however it is clear that the invention does not seal the duct itself but rather the gap between the duct and the inner cylinder 3. The document does not disclose the concept of sealing the duct itself though it does disclose an arrangement designed to seal the gap between an inner diameter of the inner tube of around 60 mm and a penetrating member as small as 10 mm in diameter. In other words, the expandable material will seal a substantial proportion of the cross-sectional area of the inner cylinder.

42 The applicant's response to this document is that it does not disclose the telescopic arrangement of inner and outer housings nor the perforated end plates. Those are however features of the first rather than the second invention. Nevertheless, and despite the attorney not questioning this, I am satisfied that neither this document nor any of the prior art documents relied on by the examiner disclose the application of intumescent material to the inside of an air ventilation duct where that material is designed to expand in the event of fire or smoke to completely seal the duct. Indeed, the typical way of fire-proofing such vents appears to be to have an intumescent grille that closes in the event of fire.

43 So the question is whether when viewed without any knowledge of the alleged invention as claimed, would the concept of applying intumescent material to the inside of a vent housing to completely seal the vent in the event of a fire have been obvious to the person skilled in the art or does it require any degree of invention?

44 The applicant has indicated that air vents according to the invention have proved to be extremely commercially successful with many thousands being sold annually for installation in existing and new buildings. No evidence has been provided of that nor whether any commercial success was indeed due to the technical merits of the invention. However, it is possible that with a closer investigation, including expert evidence and evidence of the commercial success, that the applicant may be able to demonstrate that this aspect of the invention does involve an inventive step. Indeed, given that the invention appears to be a departure from the normal method of sealing vents, I have reached the conclusion that there is a reasonable prospect that the applicant may be able to show that that is the case. Hence, I will resolve the matter in the applicant's favour and accept that the second invention does involve an inventive step.

Findings

45 I find that the invention set out in the claims filed on 15th July 2020 involve an inventive step.

Next steps

46 There is an outstanding objection relating to the clarity of claim 3. I therefore remit the case back to the examiner to consider if further action is necessary in that respect.

Appeal

47 Any appeal must be lodged within 28 days after the date of this decision.

Phil Thorpe

Deputy Director, acting for the Comptroller