

Candidate's examination paper
(Examination paper B/1991 Electricity/Mechanics)

Dear Sir

In response to the examination report we would request the examiner to make the amendments set out on the sheets headed "Amendments".

We have amended Claim 1 to specify that the resilient element is isolated from the material. Support for this amendment is found in the drawings which show clearly that the coil spring (26) is arranged around the intermediate piece (14) and thus is isolated from the material. We submit that this amendment can be clearly and unambiguously derived from the drawings and therefore does not add subject matter.

Claim 1 has been amended so that it defines the invention more clearly. We consider that none of the cited prior art discloses the features of Claim 1 and in particular there is no disclosure in any of the documents of a resilient element isolated from the material.

In paragraph 1 of the report the examiner appears to have interpreted the ribbed heating element disclosed in Document II as being the melting chamber as defined in Claim 1. In our opinion, this interpretation is not correct.

Clearly, a chamber is something which encloses or holds an object. In order to be correctly defined as a chamber, it must possess closed walls. The chamber as claimed in Claim 1 encloses the rod of adhesive and has closed walls.

However, the ribbed heating element does not possess closed walls and does not enclose the rod of adhesive being heated. Also, there are substantial gaps between the ribs and, therefore, the ribbed heating element cannot be said to "enclose" the rod of adhesive being heated.

In view of the above, we submit that the ribbed heating element cannot be correctly referred to as a "chamber" as defined in Claim 1.

Thus there is no disclosure of a chamber and we submit that Claim 1 is novel.

With regard to the question of inventive step, our comments are as follows. In both Document I and Document II, the disclosures are of resilient elements which are arranged in the path of the material.

In each case the material is pushed through the resilient element whereupon it would be heated and melted by the heaters.

In lines 22 to 28 of the specification of the present application, there is set out one of the disadvantages of the prior art disclosed in Document I, namely that a portion of the spring becomes embedded in the material and only the forward portion of the spring can be compressed at the beginning of the heating

process. This results in the spring not being able to exert adequate return force on the adhesive rod.

There is a similar disadvantage associated with the device disclosed in Document II. The material is pushed through the center of the bellows and is melted by the heaters. Thus, at least part of the bellows would become embedded in the material, and would not provide an adequate return force initially. Thus, the problem to be solved by the present invention is the manufacture of a device in which there is a resilient element which can provide an adequate return force at all times. This problem has been solved by the provision of a resilient element which acts directly on the melting chamber and which is isolated from the material.

In our opinion there is nothing in either of the cited documents which would suggest to the skilled person the use of a resilient element isolated from the material which acts on the melting chamber. Thus we submit that amended Claim 1 is patentably distinguished from the cited prior art. The remaining Claims are dependent upon Claim 1 and accordingly are, in our opinion, also patentable.

We have included in Claim 1 a discussion of Document II as required by Rule 27(1)(c) EPC. We have also included the features claimed in Claims 1 to 8 in the description to provide support for the Claims. Also, the description has been amended to make it consistent with the claims. We shall be filing a divisional application in respect of the heating cartridge.

Claim 1 has been placed into the two part form taking Document II as the most relevant prior art.

Amendments

Claim 1

Replace Claim 1 with the following:

- "1. A device for melting and dispensing thermoplastic material, comprising a heating means (45), a melting chamber (16) with an inlet (17) for the unmelted material to be fed in under pressure and an outlet (19) for the molten material, and a resilient element (26) which exerts a return force on the material against the feeding direction, characterised in that the melting chamber (16) is slidably arranged in the device, in that the resilient element (26) is isolated from the material and in that the return force of the resilient element acts on the melting chamber."

Page 2, delete line 5 and insert the following

"According to one aspect of the invention there is provided a device for melting and dispensing thermoplastic material comprising a heating means, a melting chamber with an inlet for the unmelted material which is fed in under pressure and an outlet for the molten material, and a resilient element which exerts a return force on the material against the feeding direction wherein the

melting chamber is slidably arranged in the device, the resilient element is isolated from the material and the return force of resilient element acts on the melting chamber."

Page 1, after the final paragraph insert the following

"Document II discloses a gun used for the delivery of small quantities of fusible thermoplastic compounds such as adhesives. The device comprises a heater sleeve into which a rod of the fusible thermoplastic compound is introduced. A ribbed heater element is mounted on resilient bellows and is slidable within the heater sleeve."

Page 4, delete lines 1 and 2 and replace by the following:

"Preferably the melting chamber can slide axially in a heating tube on which the heating means is provided. The melting chamber may be thermally coupled with the heating tube."

The melting chamber may be fitted with heating fins which are preferably arranged lengthwise and protrude into the chamber and whose heat transmission surface increases preferably continuously towards the outlet.

The resilient element may be a coil spring.

The heating means may be electric and may have at least one PTC resistor element.

The heating means may have a series connection of PTC resistor elements which may be arranged along the length of the melting chamber.

A number of series-connections may be selectively connectable in parallel.

The PTC resistor elements may be integrated in a heating cartridge which may have an electrically insulating, heat-resistant and preferably resilient sleeve. The PTC resistor elements may be arranged in a force fit between at least two contact bodies to provide thermal coupling. Leaf springs may be provided between the PTC resistor elements and the contact bodies."

Divisional Application

I would propose filing a divisional application for the following main claim.

1. A heating cartridge for use in a hot-melt glue gun, characterised by a plurality of PTC resistors connected together in series to define a string of said resistors.

I would argue that this claim is acceptable because there is nothing in the prior art which would suggest connecting the resistors in series. In view of this, I would feel it worthwhile trying such a claim; it is novel and it is arguably inventive.

However, if the examiner refuses to waive an objection based on lack of inventive step, I would amend Claim 1 so that it reads as follows:

1. "A heater cartridge for use in a hot-melt glue gun comprising a plurality of PTC resistor elements connected together in series to define a string of said resistor elements, characterised in that said heater cartridge comprises a plurality of said strings of said resistor elements selectively connected together in parallel".

I would submit that the above claim is patentably distinguished from the disclosures of Documents I-II because the provision of selectively suitable strings of resistors means that it is possible to select different working temperatures of the device which is not mentioned or even suggested in the prior art.