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Aktenzeichen / Case Number / N° du recours : T 202/87 - 3.2.4

Anmeldenummer / Filing No / N° de la demande : 80 902 079.5

Veröffentlichungs-Nr. / Publication No / N° de la publication : 0 041 507

Bezeichnung der Erfindung: Apparatus and process for hot-stamping containers

Title of invention:

Titre de l'invention :

Klassifikation / Classification / Classement : B44C 1/00

ENTSCHEIDUNG / DECISION

vom / of / du 25 October 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /

Titulaire du brevet :

RMK Technologies Inc.

Einsprechender / Opponent / Opposant :

Leonhard Kurz GmbH & Co.

Stichwort / Headword / Référence :

EPO / EPC / CBE Art. 56

Schlagwort / Keyword / Mot clé :

"Inventive step (no)"

Leitsatz / Headnote / Sommaire



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Boards of Appeal

Chambres de recours

Case Number : T 202/87 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 25 October 1990

Appellant :
(Proprietor of the patent) RMK Technologies Inc.
80 Kean Street
West Babylon
New York, N.Y. 11704 (USA)

Representative : Eisenführ, Speiser & Strasse
Bremen, München

Respondent :
(Opponent) Leonhard Kurz GmbH & Co.
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Representative : Louis, Pöhlau, Lorenz & Segeth
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Decision under appeal : Decision of Opposition Division of the European Patent
Office dated 8 April 1987 revoking European patent
No. 0 041 507 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : P.E.M. Delbecque
Members : H.P. Ostertag
O.P. Bossung

Summary of Facts and Submissions

- I. European patent No. 0 041 507 was granted on 20 March 1985 on the basis of European patent application No. 80 902 079.5, filed on 2 September 1980.
- II. The Respondent filed a notice of opposition to this patent on 18 December 1985 requesting that the patent be revoked in its entirety. The opposition was based on
 - D1: US-A-3 640 213
 - D2: Pamphlet "Das Prägen von Kunststoffen" by Blattgoldwerke Leonhard Kurz, Fürth/Bayern, edited 1963.
- III. Considering that the subject-matter of the independent Claims 1 and 8 did not involve an inventive step and that the proposed supplementary Claims 11 to 19 were not allowable under Article 123(3) EPC, the Opposition Division revoked the patent in a decision dated 8 April 1987.
- IV. An appeal against this decision was lodged by the Appellant (Patentee) on 6 June 1987, the appeal fee was paid on the same day and the grounds of appeal were filed on 10 August 1987. The Appellant requested to cancel the decision of the Opposition Division and to maintain the patent on the basis of the Claims 1 to 10 as granted.
- V. Oral proceedings were held on 25 October 1990 during which the Appellant requested to maintain the patent on the basis of the following independent claims submitted during the oral proceedings:
 - "1. A method for hot die transfer of foil material onto containers (10), comprising the steps of:

mounting a series of containers (10) onto spaced mandrels (36), indexing foil tape (26) of predetermined length past a heated die (20) which includes a die plate (101) providing the image intended to be transferred onto the container (10) from the foil (24), mounting said die (20) to provide for linear engagement between the container (10) and die (20) as the two are engaged under normal pressure with the foil (24) pressed therebetween, and translating the container (10) on the mandrel (36) across the face of the die (20) while permitting relatively free rotation thereof whereby foil (24) is hot-pressed to effect a transfer of foil (24) onto the surface of the container (10) in accordance with the pattern imposed by said die (20) as linear engagement successively transfers foil (24) onto the surface of the container (10), characterized in that the container is a plastics container (10) the surface of which is brought to and maintained in a visco-elastic state during the transfer with a transfer time of one fifteenhundredth of a second with peripheral stamping.

8. An apparatus for imparting hot die roll marking on containers (10) comprising a stationary die (20) having mounting means, spaced mounting means (36, 38) for receiving containers thereon intended for stamping, means (58, 74, 80, 100, 122) for biasing the container (10) against the die (20) to effect linear engagement therebetween, and means (12) for advancing the container (10) across the face of the die (20) to effect simultaneous rotation of the container (10) and successive transfer of foil (24) received on a flexible tape (26) pressed between confronting surfaces of the die (20) and container (10) respectively, characterised in that electrical circuit means are provided for heating the die (20) and thereby maintaining the surface of the containers (10) in a visco-elastic state during the transfer with a

transfer time of one fifteenhundredth of a second with peripheral stamping."

- VI. The Respondent requested to dismiss the appeal.
- VII. The Appellant essentially argues that hot-stamping with the surface of the substrate brought to the visco-elastic state requires by far higher temperatures (as shown by Figure 14 of the patent) than the ones referred to in D2. He concludes that D2 does not disclose nor hint at working in this state and if permanent deformations of the substrate occur, they must have been obtained by forced rubbery deformation of the substrate being in the rubbery or even in the glassy state. In support of this he refers to the textbook "Mechanical properties of Polymers" by N.M. Bikales, John Wiley and Sons, 1971 (D3) especially the paragraph bridging pages 18 and 19. Moreover, the skilled man would be reluctant to work in the visco-elastic state since the temperature range of this state is quite narrow so that there would be the risk of falling outside this range during practical operation. D2 also does not refer to any transfer time, let alone to the very short transfer time as claimed.
- VIII. The Respondent argues that permanent deformations as referred to in D2 are only possible in the visco-elastic state. D3 refers to the phenomenon of permanent deformation obtainable by subjecting a plastics material to elongational, but not compressing stress in the rubbery or glassy state. Moreover, D2 provides the skilled person with full information on how to arrive at optimum process conditions by carrying out simple experiments.

Reasons for the Decision

1. The appeal is admissible.
2. New Claims 1 and 8 both differ from corresponding Claims 1 and 8 as granted by the addition of the feature "... with a transfer time of one fifteenhundredth of a second with peripheral stamping". This amendment is disclosed in column 2, lines 21 to 24 of the patent specification as well as in a corresponding identical statement in the application as filed and constitutes a limitation of the scope of protection conferred.

Hence the provisions of Article 123(2) and (3) EPC are met.

3. Novelty

The Board is satisfied that none of the cited documents discloses a method and apparatus having all the features recited in Claims 1 and 8 respectively. Since novelty has not been disputed either by the Respondent or by the impugned decision, there is no need to further substantiate this matter. Therefore, the subject-matter defined by Claims 1 and 8 respectively is to be considered novel within the meaning of Article 54 EPC.

4. Closest prior art

In the Board's view, the closest prior art is represented by D1 which is discussed in the description of the patent and which discloses method and apparatus for hot-stamping containers as defined in the pre-characterising part of Claim 1 and 8 respectively. In addition, D1 also discloses electrical heating of the die (column 2, lines 27, 28).

However, D1 is silent with respect to process parameters such as temperature, pressure, transfer time etc. to be observed when decorating containers of plastics (or any other) material and to the performance of the electrical heating.

5. Problem and Solution

In the light of this prior art, the problem underlying the invention is to be seen in conducting the process of D1 such as to obtain consistent high quality hot-stamping (i.e. good adhesion and high quality appearance) at high production speed (see also column 2, lines 49 to 52 and column 13, lines 43 to 51).

According to the solution the surface of the plastics container is brought to a visco-elastic state, i.e. the state in which permanent deformation of the material occurs so that imperfections of the geometrical surface are equalled out, allowing chemical bonding to be achieved throughout the surface within a short transfer time.

6. Inventive step

6.1 As regards the problem itself, the Board cannot recognise that its finding requires any inventive activity, since it is the normal aim of skilled persons to conduct a manufacturing process such as to obtain optimum quality at optimum process speed.

6.2 The Board likewise cannot recognise any inventive activity in using the process of D1 for decorating containers of plastics material, since as stated in D2 (page 17, first paragraph) - hot-stamping is a method widely used for decorating articles of plastics material.

Moreover, US document D1 itself provides some hint as its Figure 4 shows the container in cross-section with the hatching symbolising - at least according to the official code of Federal regulations in the US - plastics material.

6.3 There remains the question whether the remaining features of Claim 1 can be regarded as involving an inventive step.

6.3.1 It is to be noticed that Claim 1 does not mention any specific values or ranges of values for temperature and pressure to be observed. This means that in practice these two process parameters as well as the linear speed of the container past the die are to be selected - in dependence of the properties of the respective plastics material - such that the surface of the container is brought to and maintained in a visco-elastic state during the transfer time of 1/1500 sec.

6.3.2 In its chapter "Pressure and heat" document D2 deals with some general aspects of hot-stamping processes on plastics material. In particular it states that in view of the great variety of plastics materials it is not possible to lay down any norms but that optimum values for a given material are to be determined by experiments, whereby it is to be considered that too low temperatures result in bad adhesion of the foil to the substrate and too high temperatures result in unsharp outlines of the image. In some cases it may be useful to work at temperatures above the softening point because then the image is recessed and protected against mechanical wear, provided that such high temperatures do not cause the tape material to be damaged.

- 6.3.3 In the Board's view, this latter mode of processing implies an irreversible deformation of the surface material of the substrate which in turn requires that that material is brought to the visco-elastic state since irreversible deformation of this kind is only possible in the visco-elastic state. Hence, working in this state is disclosed by D2 as a possibility for obtaining optimum hot-stamping results which the skilled person would obviously take into consideration when operating a device as disclosed in D1.
- 6.3.4 Although D2 is silent with respect to transfer time it is evident that transfer time represents a further process parameter which is to be taken into consideration when determining optimum process parameters for the peripheral hot-stamping process of D1 whereby there is a strong motivation to experiment transfer times as short as possible in order to enhance the linear speed of the containers past the die, i.e. the production rate of the device. Hence, the finding of the specific transfer time referred to in Claim 1 is to be regarded as the result of normal considerations and experiments.
- 6.4 To summarise, the Board concludes that the skilled person, confronted with the problem of optimally operating the device of D1, would obviously arrive at the claimed process by adopting normal considerations and by carrying out experiment as proposed by D2, without involving an inventive step as required by Articles 52(1) and 56 EPC.
- 6.5 As already set out in point 4 above, the subject-matter of Claim 8 differs from the apparatus according to D1 only in the sense that the electrical heating of the die is designed such as to bring the surface of a plastics material to the visco-elastic state and maintaining it in this state during the transfer time.

The finding of this feature, however, does not imply an inventive step by the same reasons as set out above with respect to Claim 1.

7. The Board cannot accept the Appellant's argument that working in the visco-elastic state generally requires by far higher temperatures than envisaged by D2. He refers to Figure 16 of the European patent which shows the thermomechanical curve of a non-identified plastics material with the visco-elastic state starting at about 350°C, whereas D2 refers to temperatures of 100°C - 170°C. It is pointed out again that the claims do not refer to any specific temperatures but to the specific physical state to which the surface must be brought, at whichever temperature range this state occurs. The actual temperature required depends on the specific material and varies considerably.

8. The Board also cannot agree with the Appellant's allegation that the permanent deformations referred to in D2 (recessed image) must have been obtained by forced rubbery deformation. Indeed, the mentioned paragraph bridging pages 18 and 19 of D2 relates to permanent deformations obtained under elongational stress of a substrate in the glassy state but not to deformations under compressing stress. The skilled person, therefore would not consider any other possibility than that the deformations mentioned in D2 were obtained by bringing the surface of the substrate to the visco-elastic state.

9. Finally, the Board also cannot accept the Appellant's opinion expressed in his written submission - but not maintained in the oral proceedings - that Claim 1 is to be construed - in the light of the description - as meaning that only the outermost surface portion of the substrate, within a depth of a few molecular layers only, is brought

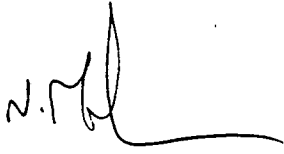
to the visco-elastic state. In the Board's opinion, the description is not unambiguous in this respect and does not justify this narrow interpretation.

Order

For these reasons, it is decided that:

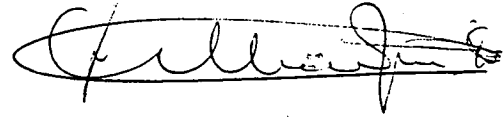
The appeal is dismissed.

The Registrar:



N. Maslin

The Chairman:



P. Delbecque