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D E C I S I O N
of 2 July 1997

Case Number: T 0940/93 - 3.2.5

Application Number: 85400891.9

Publication Number: 0161189

IPC: B29C 45/16

Language of the proceedings: EN

Title of invention:
Hot runner mold for three-layer molding

Patentee:
Nissei ASB Machine Co., Ltd

Opponent:
Battenfeld GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes) - after amendment"

Decisions cited:
-

Catchword:
-

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Case Number: T 0940/93 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 2 July 1997

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 10 September 1993 revoking European patent No. 0 161 189 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: G. O. J. Gall
Members: W. D. Weiß
A. Burkhart

Summary of Facts and Submissions

I. The appellant (proprietor of the patent) lodged an appeal against the decision of the Opposition Division on the revocation of the European patent No. 0 161 189.

Opposition was filed against the patent as a whole and based on Article 100(a) EPC in conjunction with Articles 54 and 56 EPC (lack of novelty and inventive step).

The Opposition Division held that the grounds for opposition mentioned prejudiced the maintenance of the patent due to lack of inventive step having regard to the following documents:

E1 DE-A-2 716 817 (corresponding to US-A-4 106 887 [E1']), and

E3 FR-A-2 278 479.

II. In a communication issued together with the summons for oral proceedings the Board expressed as its provisional opinion that the subject-matter of Claim 1 as granted as well as of Claim 1 according to a first auxiliary request filed together with the grounds of appeal failed to involve an inventive step, and that Claim 1 according to a simultaneously filed second auxiliary request offended against the provisions of Article 123(2) EPC.

III. At the end of the oral proceedings of 2 July 1997 the following requests were submitted:

The appellant (proprietor) requested that the decision under appeal be set aside and the patent be maintained in amended form with Claim 1 as presented at oral

proceedings on 2 July 1997, Claims 2 and 3, description and drawings as granted.

The respondent (opponent) requested that the appeal be dismissed.

IV. The wording of Claim 1 as presented at oral proceedings reads as follows:

"1. A hot runner mold for three-layer molding used for the injection molding of a synthetic resin molded article having a three-layer construction comprising:

a block (1) interiorly comprising a hole (4) having an open end, a nozzle tube (5) comprising a nozzle member (5a) at one end portion thereof, an intermediate tube portion (5b) having an outer diameter smaller than that of said hole, and a base end portion (5c) opposite the one end portion, the tube (5) having an opening (5d) at the base end portion (5c), said tube (5) being forced within said hole (4) to a position but removable, said nozzle member (5a) projecting from said block (1) when said tube is forced to said position,

a first resin passage (A) formed between the wall of the hole (4) and the intermediate tube portion (5b) when said nozzle tube (5) is inserted into and secured to said hole (4), a second resin passage (B) within the nozzle tube (5) leading from the said opening (5d) at the base end portion (5c) to the said nozzle member (5a) and a nozzle cap (6) having a nozzle mouth (6a), said nozzle cap being screwed into said open end of said hole (4) to provide a communication between the first resin passage (A) and said nozzle mouth (6a) and to cover said nozzle member projecting from the block to form a nozzle having a double construction in nozzle touch with a cavity gate of the mold,

characterized in that said hole (4) has a bottom end opposite the said open end, in that the said base end portion (5c) of the tube (5) is fitting into said hole (4) at the said bottom end when said tube (5) is forced to said position, in that said nozzle member (5a) is positioned within the nozzle mouth (6a) when said tube (5) is forced to said position, in that said block is a hot runner block (1) interiorly comprising two parallel hot runners (2, 3) and a plurality of said holes (4) at right angles with and crossing each of the hot runners (2, 3), said hot runner block (1) being provided at the side thereof with gates (2a, 3a) connected to each of the hot runners, in that the said opening (5d) at the base end portion (5c) of each tube and one of said hot runners (3) register when said tube is forced to said position, and said first passage (A) of each hole (4) is connected to the other hot runner (2)."

V. The appellant (proprietor) argued as follows:

The subject-matter referred to a mould particularly adapted to the injection moulding of articles having a three-layer construction in nozzle contact of which mould is one of a plurality of nozzles projecting from a specifically constructed runner block. The distance between the mould and the hot runner block maintained by the projecting nozzle member warranted that the temperature of the hot runner block could be maintained when the mould passed the cooling phase of the injection moulding cycle.

Only document E3, from the two documents still discussed at the appeal stage, disclosed a nozzle and mould intended to produce articles having a three-layer construction.

Therefore, the apparatus disclosed by this document had still to be considered as the closest prior art, the disadvantages of which were the basis for the combination of problems solved by the patent in suit.

The function of the mould and nozzle combination disclosed in document E1, in contrast thereto, was the production of hollow articles. This function implied that, during the injection phase, only one of the flow passages was permanently open to the mould whereas the other was only temporarily open and had to be obstructed in a timely controlled manner. Consequently, the nozzle of this known apparatus included a valve function which would have to be inactivated in the case this nozzle were misused in connection with a mould adapted to produce articles having a three-layer construction. If a person, nevertheless, would try and construct a new mould/nozzle/runner block construction on the basis of a combination of these two documents, he would not arrive at the subject-matter of the patent in suit.

VI. The respondent argued as follows:

The nozzle displayed in Figure 10 of document E1 had to be rated as the closest prior art. Although demonstrated in connection with the production of hollow or foamed articles with a smooth skin structure, it was evident to any skilled person that this nozzle as constructed to be apt for various uses including the production of articles having a three-layer construction. When compared to this known progressive construction, the subject-matter of the patent had to be rated as being technically retrograde.

It was evident that the nature of the Figure 10 of document E3 was only schematic and not intended to serve as a blueprint for the workshop. Therefore, the

features still missing when combining the teaching of documents E1 and E3 would have been added by the constructional engineer in the course of his daily routine.

Reasons for the Decision

1. *Original disclosure*

The amended Claim 1 is based on the granted Claim 1 which has been restricted and clarified by elements of the "Detailed Description of the Invention" in the description of the patent in suit. Since all these parts of the patent as granted are based on the documents as filed, the amended Claim 1 is not open to objections on grounds of Article 123 EPC.

2. *Novelty*

It has not been contested that none of the documents cited discloses, in combination, all the features of Claim 1.

Consequently, the subject-matter of Claim 1 is novel.

2. *Inventive step*

2.1 The subject-matter of Claim 1 concerns a hot runner mould for three layer moulding. For being apt to produce a three-layer product as aimed at by the patent at issue, it is not sufficient that the nozzle, which is in contact with the cavity gate of the mould has a particularly adapted construction allowing for the simultaneous maintenance of two concentric streams of synthetic resins, but also the mould cavity must be specifically designed and contain a central core

splitting each of the two streams of synthetic resin in a defined manner without mixing them (see Figure 3 of the patent in suit).

The injection moulding device according to Figure 10 of document E1 is constructed to integrate mould, nozzle and runner in one block and is particularly adapted to produce hollow articles or foamed articles having a smooth skin, hence articles having a two layer construction. To be fit for this function (see page 10, second paragraph) the nozzle has a valve construction allowing that first liquid plastics and subsequently a fluid medium are injected into the mould cavity. The mould cavity is devoid of any core and, therefore, not adapted to produce an article having a three-layer construction. Consequently, the known integrated moulding device would not be apt, and was not intended, to produce an article having a three-layer construction, even if the nozzle, as suggested by the respondent, were misused by maintaining the valve of the nozzle in the open position during the whole injection cycle. This known device is, due to its integrated construction, not flexibly adaptable to produce a variety of types of articles but specifically apt to produce hollow articles or foamed articles having a smooth skin.

Document E3 (see Figure 4) discloses a separate nozzle construction which is immediately apt to mould articles having a three-layer construction when brought into nozzle contact with the gate of a usual, generally known mould comprising an adequate core.

Consequently, the device disclosed in document E3 (see in particular Figures 1 and 4), which comprises all the features in the preamble but not those in the characterising part of Claim 1, continues to stand for the closest prior art.

2.2 Starting from E3 as the closest prior art, the patent in suit aims to solve the problem of creating a low cost hot runner mould which permits the simultaneous moulding of a plurality of articles having a three-layer construction which can be easily assembled and disassembled, in which the two resins smoothly flow and are distributed to various nozzle members without blending of the resins to ensure the production of clearly structured three-layer articles. The device should be constructed to avoid the freezing of the resins in the hot runners during the cooling phase of the moulding cycle.

This complex problem is solved by the characterising features of Claim 1.

2.3 Even if a person skilled in the art aiming to solve the above defined problem would decide to keep for his prospective construction from the device known from Figure 4 of document E3 just those features enumerated in the preamble of Claim 1 and then decide to modify it on the basis of elements taken from document E1, he would not arrive at the subject-matter of Claim 1.

The person skilled in the art taking document E3 into consideration would first have to have the idea to dissolve the integration between mould and runner block, which the author of document obviously has considered as one of the essential features of his construction, and arrange the nozzle caps in this newly created gap between mould and runner block. But even after this initialising step having been done, the hypothetical device then continued to be constructed would at least not have one of the runners registering with the opening of the base end portion. The runner block of this device would not have (blind) holes having an open end and a bottom end opposite the bottom end. Since the device according to Figure 10 of

document E1 does not instruct about its assembling, the respective construction must be taken from the Figure 4 of document E3 showing a through hole with two open ends. These features of the device according to Claim 1, which the hypothetically constructed device would not avail of, are, however essential for the smooth flow of the hot plastic material as well as for the economic construction and easy maintenance of the device of the patent in suit.

Consequently, a combination of the teachings of the documents E3 and E1 does not provide an obvious way leading to the subject-matter of Claim 1 as now amended which, therefore, involves an inventive step in the meaning of Article 56 EPC.

3. Therefore, the subject-matter of Claim 1 constitutes a patentable invention in the meaning of Article 52(1) EPC, and Claim 1 is thus allowable.

The same applies to dependent Claims 2 and 3 which refer to further embodiments of the subject-matter of Claim 1.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent in the following version:

   - Claim 1 as presented during the oral proceedings on 2 July 1997;

   - Claims 2 and 3 as granted;

   - description as granted;

   - drawings as granted.

The Registrar: The Chairman:

A. Townend G. Gall

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