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**Datasheet for the decision
of 9 August 2011**

Case Number: T 0337/09 - 3.2.05

Application Number: 00940095.3

Publication Number: 1214185

IPC: B29C49/56

Language of the proceedings: EN

Title of invention:
BLOW MOLDING CLAMP ARRANGEMENT

Patent Proprietor:
Husky Injection Molding Systems Ltd.

Opponent:
PROTECHNA S.A.

Headword:

Relevant legal provisions:
EPC Art. 56, 84, 123(2), 123(3)

Keyword:
Admissibility of the amendments (yes)
Reformatio in peius (no)
Inventive step (yes)

Decisions cited:
G 1/99

Catchword:



Case Number: T0337/09 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 9 August 2011

Appellant:
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Decision under appeal:

**Interlocutory decision of the Opposition
Division of the European Patent Office
posted 22 December 2008 concerning
maintenance of European patent No.
1 214 185 in amended form.**

Composition of the Board:

Chairman: W. Zellhuber
Members: S. Bridge
M.J. Vogel

Summary of Facts and Submissions

- I. The appellant (opponent) lodged an appeal against the interlocutory decision of the Opposition Division maintaining European patent No. 1 214 185 in amended form.
- II. An opposition was filed against the patent as a whole based on Article 100(a) EPC (lack of inventive step, Article 56 EPC).
- III. Oral proceedings were held before the Board of Appeal on 9 August 2011.
- IV. The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 1 214 185 be revoked.
- V. The respondent (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained on the basis of either claims 1 to 6, description pages 2 to 4, drawing figures 1 to 5, all documents filed during oral proceedings (main request), or on the basis of claims 1 to 5, filed on 8 July 2011 (auxiliary request).
- VI. Independent claims 1 and 6 of the main request read as follows:

"1. A blow clamp (10) for a blow molding apparatus having first (12) and second platens (14), said blow clamp (10) comprising:
at least two clamping piston nuts (28) housed in said first platen (12), each clamping piston nut being axially moveable and having radially inwardly extending

teeth (38) arranged in rows separated by longitudinally extending spaces (40),
rotatable (sic) tie bars (30) secured to said second platen (14) for registering with respectively aligned clamping nuts (28), each tie bar (30) having an end extending outwardly from said second platen (14), and having radially outwardly extending teeth (34) arranged in rows separated by longitudinally extending spaces (36), said spaces (36, 40) having a breadth and a location such as to allow said teeth (34, 38) to respectively pass therebetween when said teeth are aligned therewith, said tie bars (30) being movable between an engaging configuration in which each tie bar (30) can be secured against axial movement relative to said clamping nuts (28), and a disengaging configuration in which said tie bars (30) are freely axially movable relative to said clamping piston nuts (28), wherein in said engaging configuration said teeth (34) on the tie bars (30) positively engage said teeth (38) on respective of said clamping piston nut (28) through rotation of each tie bar (30) to its respective clamping piston nut (28), thereby inhibiting, once positive engagement has been achieved, further axial movement between the tie bars (30) and the clamping piston nuts (28), and wherein in said disengaging configuration said teeth (34) on the tie bars (30) do not engage said teeth (38) on said clamping piston nuts (28),
a clamping force applicator (72, 74) associated with said clamping piston nuts (28) for generating an axial clamping force when the clamping piston nuts (28) and the tie bars (30) are positively engaged with each other, and a ball screw drive (24) actuated by a motor (26) for opening and closing the platens to cause, in use, axial movement of the tie bars (30) relative to the clamping piston nuts (28),

an actuator assembly (50, 60) rotating said tie bars (30) about respective axis (32), between said engaging configuration and said disengaging configuration,
the first and second platens being slidable along fixed rails (20, 22), the first and second platens both move to produce a platen closed position where the axial clamping force is required to be generated and a platen open position, and
in the platen open position each tie bar is fully withdrawn and separated from its respective clamping piston nut (28) such that a gap exists between the end of each tie bar (30) and the respective clamping piston nut (28),
wherein the gap between the end of each tie bar (30) and the respective clamping piston nut (28) is sufficient to permit passage of a pallet track therebetween."

"6. A method of blow molding parisons held between mold halves by a blow clamp of a blow molding apparatus, the blow molding apparatus having:
first (12) and second (14) platens slidable along fixed rails (20, 22), the first and second platens holding the mold halves, and being movable between a closed position and an open position,
at least two clamping piston nuts (28) housed in said first platen (12), wherein each piston nut (28) being axially movable and having radially inwardly extending teeth (38) arranged in rows separated by longitudinally extending spaces (40), and wherein each clamping piston nut (28) includes a fluid pressure actuatable piston (72) for applying an axial closing force to the clamping piston nut (28), and
rotatable (sic) tie bars (30) secured to said second platen (14), each tie bar (30) having an end extending

outwardly from the second platen (14) and having radially outwardly extending teeth (34) arranged in rows separated by longitudinally extending spaces (36), said spaces (36, 40) having a breadth and location such as to allow said teeth (34, 38) to respectively pass therebetween when said teeth (34, 38) are aligned therewith,

the method comprising:

registering respective tie bars (30) with correspondingly aligned clamping piston nuts (28);

moving said tie bars between an engaging configuration in which each of said tie bars (30) is secured against axial movement relative to said clamping piston nuts and a disengaging configuration in which said tie bars (30) are freely axially movable relative to said clamping piston nuts (28),

wherein in said engaging configuration said teeth (34) on the tie bars (30) positively engage said teeth (38) on respective of said clamping piston nuts (28) through rotation of each tie bar (30) to its respective clamping piston nut (28), and wherein in said disengaging configuration said teeth (34) on the tie bars (30) do not engage said teeth (38) on said clamping piston nuts (28),

when the tie bars (30) are in the engaging configuration applying a clamping force between the platens in the process of blow molding parisons by applying said axial closing force to each of said clamping piston nuts (28), and after blow molding of the parisons releasing the positive engagement between each tie bar (30) and its respective clamping piston nut (28) and withdrawing and separating said tie bars (30) from said clamping piston nuts (28) to open the mold, whereby a gap exists between the end of each tie bar (30) and the respective clamping piston

nut (28), the gap being sufficient to permit passage of a pallet track therebetween."

VII. The following documents are referred to in the present decision:

D1: WO-A-96/41711

D2: DE-A-19747698

D5: DE-A-4412883

VIII. The arguments of the appellant in the written and oral proceedings can be summarised as follows:

The claimed invention differs from the closest prior art disclosed in document D2 in that the tie bars are rotated between an engaging and a disengaging configuration respectively implemented by means of longitudinally arranged rows of segmented teeth.

Both the patent in suit (paragraph [0011]) and document D5 (column 2, lines 12 to 17) are concerned with the problem of wear during rotation. Document D5 teaches that the rotational and axial movements do not need to take place at the same time (column 2, lines 20 to 34) and, further, that it generally suffices that one of the clamping nuts and tie bars be both axially and rotationally movable while the other is fixed (column 2, lines 45 to 55).

In view of document D2 disclosing axially movable tie bars in the embodiment of figure 1 and axially movable clamping nuts in the embodiment of figure 4, the skilled person would infer from the above mentioned passages of document D5 that it is not necessary for both movements to be carried out by the same component

so that wear caused by the rotation of hydraulic pistons can be avoided.

Furthermore, both document D5 (figures 4 to 6) and document D1 (figures 1 and 2) disclose suitable arrangements of teeth for locking the tie bars and clamping nuts.

The subject-matter of claim 1 according to the main request is therefore obvious with respect to the teachings of documents D2, D5 and D1. This argumentation also carries over to corresponding method claim 6 according to the main request.

IX. The arguments of the respondent in the written and oral proceedings can be summarised as follows:

The subject-matter of the main request has been restricted to the preferred embodiment and thus meets the requirements of Article 123(2) and (3) EPC.

Document D5 has more features in common with the claimed invention and should thus be considered as closest prior art rather than document D2 which describes the locking mechanism in more general terms (see column 4, lines 42 to 60; column 5, lines 53 to 67) without providing any details of the engagement elements on the tie bars and clamping nuts.

Furthermore, according to document D2, the tie bars and associated clamping force applicators do not rotate, so that the problem concerning the rotation of hydraulic piston or cylinder components, as addressed by the patent in suit (paragraph [0011]), does not arise.

According to document D5 a cross shaped tie bar head is received in a piston clamping nut which is rotated and

displaced for clamping while the tie bars are fixed to the platen (column 4, line 61 to column 5, line 10; column 5, lines 59 to 65; figures 3 to 6). Thus, document D5 also cannot direct the skilled person towards rotating tie bars. It follows that the combination of the teachings of document D2 and D5 cannot result in the claimed invention. The further document D1 concerns injection moulding instead of blow moulding and similarly only discloses fixed tie bars cooperating with rotating piston clamping nuts (page 6, line 25 to page 7, line 15). The argumentation of the appellant is thus based on hindsight.

The subject-matter of claim 1 according to the main request therefore involves an inventive step. For the same reasons, corresponding method claim 6 also involves an inventive step.

Reasons for the Decision

1. Amendments (main request)
 - 1.1 The amended claims now define the engaging elements, their respective movements (axial and rotational) and the positions (engaging and disengaging).

These amendments are based on claim 1 of the application as filed and the added features are disclosed in combination in claims 2 to 9 of the application as filed as well as in the corresponding description of the preferred embodiment (see pages 4 to 7, application as published).

1.2 The final feature of claim 1 (main request) "*the gap between the end of each tie bar (30) and the respective clamping piston nut (28) is sufficient to permit passage of a pallet track therebetween*" was introduced into claim 1 during the opposition proceedings. This feature is unclear (Article 84 EPC), because it attempts to define the size of the gap through reference to an unclaimed "*pallet track*". However, this feature has some technical meaning in the sense that very small gaps are excluded from the scope of the claim. Thus, this unclear feature cannot be removed from the subject matter of claim 1 (main request), because it would put the only appellant (opponent) in a worse position than if he had not appealed (*reformatio in peius*).

1.3 The feature that the first and second platens "*are suspended from ...*" fixed rails was added to the subject-matter of claim 1 (as maintained in the opposition proceedings) during the opposition proceedings and was the subject of an investigation under Article 123(2) EPC in the impugned decision (section 2, page 4). Although the opposition division considered the feature "*suspended from ...*" fixed rails to be implicitly disclosed in the application as filed, the Board is of the opinion that it is not immediately obvious to the skilled person that a feature which is not discussed at all in the description and can only be isolated from figure 1 of the first embodiment constitutes a distinguishing, essential feature of the invention as argued in the context of inventive step in the respondent's letter of 25 August 2009 (page 10, second paragraph and page 14, section 15).

As the feature that the first and second platens "*are suspended from ...*" fixed rails was not originally

disclosed, it both contravenes Article 123(2) EPC and constitutes an inadmissible amendment which was nevertheless held allowable by the Opposition Division in its interlocutory decision.

In accordance with the Enlarged Board of Appeal Decision G 1/99 (published in OJ 2001, 381) and in the absence of both the possibility of an amendment introducing one or more originally disclosed features which limit the scope of the patent as maintained and of an amendment introducing one or more originally disclosed features which extend the scope of the patent as maintained, but within the limits of Article 123(3) EPC, the only recourse for claim 1 of the main request is to delete this inadmissible amendment while remaining within the limits of Article 123(3) EPC.

The appellant has not raised any objections on the grounds of *reformatio in peius*.

- 1.4 The subject-matter of the claims of the main request thus satisfies the requirements of Article 123(2) EPC.

The added features restrict the scope of the independent claims (main request) with respect to the claims as granted so that the requirements of Article 123(3) EPC are met.

The appellant has not raised any objections on formal grounds against the amendments made in the claims according to the main request.

2. Inventive step

2.1 Document D2

Document D2, which is considered to be the closest prior art, discloses a blow clamp (figure 1) for a blow molding apparatus having first (20) and second platens (18) both slidable along fixed rails (16), at least two clamping piston nuts (26, 28) fixedly housed in said first platen (20), tie bars (30, 32) secured to said second platen (18), clamping force applicators associated with the tie bars, a motor (38) drive for opening and closing the platen (column 4, lines 36 to 48; column 5, lines 1 to 10).

According to document D2, the tie bars are fully withdrawn and separated from their respective clamping piston nuts in the platen open position such that a sufficient gap exists between the end of each tie bar and the respective clamping piston nut so as not to hinder the removal of the blow moulded articles (column 4, lines 56 to 60).

It was argued on behalf of the appellant, that in the figure concerning the two station blow molding machine (figure 4 of document D2), the clamping piston nuts may be associated with a clamping force applicator. However, this aspect is not mentioned in description and therefore has to be considered speculative.

Document D2 thus does not disclose the following features:

- the clamping piston nuts being axially movable by a clamping force applicator
- a cooperating arrangement of rows of segmented teeth on the clamping piston nuts and rotatable

- tie bars for implementing the engaging and disengaging configurations
- rotatable tie bars driven by an actuator assembly between said engaging and disengaging configurations, and
 - a ball screw drive for opening and closing the platens.

Thus the drive mechanisms for operating the blow mould according to claim 1, main request, are, on the one hand, separated into a ball screw drive for the translatory movement of the tie bars and clamping nuts during opening and closing the platens and an actuator assembly for rotating the tie bars into, and out of, the engaging and disengaging configurations, and, on the other hand, a clamping force applicator which only moves the clamping piston nuts axially for holding the mould shut during blow moulding.

This combination of features thus eliminates the application of both rotational and translational forces to any one component of the blow clamp, thereby avoiding the friction and wear associated with rotating the hydraulic seals on a hydraulic piston (paragraph [0030], patent in suit). The corresponding objective problem is thus *"to provide a blow clamp arrangement which doesn't require any rotation of any hydraulically actuatable piston or cylinder components for engagement and disengagement"* (paragraph [0011], patent in suit).

Document D2 is silent concerning the details of the engagement and disengagement mechanism on the tie bars and clamping nuts. Thus, there is no actual disclosure in document D2 of any rotation of hydraulic piston or cylinder components for engagement and disengagement.

Thus, the skilled person starting from document D2 would only be motivated to seek a suitable mechanism for the engagement and disengagement of the tie bars and clamping nuts.

2.2 Document D5

Document D5 discloses a blow clamp (figures 3 to 7) for a blow molding apparatus having first (36a) and second platens (36b), tie bars (32b) secured to said second platen (36b) and axially movable (16b) clamping piston nuts (32a, 80a) housed in said first platen (36a). A clamping force applicator (42) is associated with each clamping piston nut (32a, 80a) (column 4, lines 14 to 20). Hydraulic cylinders are used for opening and closing the platens (column 3, lines 53 to 56).

The clamping piston nuts and tie bars have teeth separated by spaces for implementing the engaging and disengaging configurations. These configurations are attained through rotation (92) of the clamping piston nuts (32a, 80a) while the tie bars do not rotate (column 4, line 61 to column 6, line 3, figures 5 and 6). According to figure 3, the tie bars are fully withdrawn and separated from the clamping piston nuts in the platen open position.

Document D5 thus does not disclose the following features:

- rotatable tie bars driven by an actuator assembly between said engaging and disengaging configurations,
- rows of teeth on the tie bars and piston clamping nuts, and
- a ball screw drive actuated by a motor for opening and closing the platens sliding along fixed rails.

Document D5, which is concerned with avoiding wear on the engaging mechanism (column 2, lines 12 to 17), emphasises that the rotational and axial movements of the clamping piston nuts provides the advantages of a simple and compact arrangement (column 6, lines 60 to column 7, lines 10). Document D5 thus teaches directly away from the patent in suit which aims to have axially movable clamping piston nuts and rotatable tie bars. For this reason, document D5 cannot be considered as the closest item of prior art, although this was argued on behalf of the respondent, based on a perceived greater number of features in common with the claimed invention.

2.3 Document D1

Although document D1 is concerned with injection moulding and not with blow moulding, the clamping arrangement disclosed therein is nevertheless considered in the patent in suit (paragraph [0004]).

Document D1 discloses a clamp (figures 1 to 6) for an injection molding apparatus having a fixed first platen (14) and a movable second platen (20), tie bars (32b) fixedly secured to said second platen (20) and axially movable clamping piston nuts (34) housed in said first platen (14). A clamping force applicator (28, 26) is associated with each clamping piston nut (34) (page 6, line 20 to page 7, line 15).

The clamping piston nuts and tie bars have rows of teeth separated by longitudinal spaces for implementing the engaging and disengaging configurations. These configurations are attained through rotation of the clamping piston nuts (34) while the tie bars do not

rotate (page 6, line 25 to page 7, line 15; page 8, line 3 to page 9, line 2).

The movable platen is guided along a base (12) when being closed by means of hydraulic cylinders (25) (page 6, lines 6 to 19).

According to figures 1 and 2, the tie bars are never fully withdrawn and separated from the clamping piston nuts in the platen open position.

Thus, document D1 also fails to disclose rotatable tie bars driven by an actuator assembly between said engaging and disengaging configurations or a ball screw drive actuated by a motor for opening and closing the platens.

2.4 Claim 1 (main request)

Thus, no combination of the disclosures of documents D1, D2 or D5 can lead the skilled person to the following combination of features:

- rotatable tie bars driven by an actuator assembly between said engaging and disengaging configurations,
- a cooperating arrangement of rows of segmented teeth on the clamping piston nuts and rotatable tie bars for implementing the engaging and disengaging configurations,
- the clamping piston nuts being axially movable by a clamping force applicator, and
- a ball screw drive for opening and closing the platens.

Thus, even if the skilled person were motivated to combine the teachings of any of documents D1, D2

and D5, he could not arrive at the subject-matter of claim 1 according to the main request. Therefore, the appellant's argumentation is based on hindsight.

None of the other cited documents go beyond the disclosure of documents D1, D2 and D5.

The subject-matter of claim 1 according to the main request is thus based on an inventive step (Article 56 EPC).

2.5 The subject-matter of claims 2 to 5 which are appendant to independent claim 1 similarly involves an inventive step.

2.6 Claim 6

The above inventive combination of technical apparatus features of claim 1 (main request) is also correspondingly present in method claim 6, so that the above reasoning carries over likewise to that method claim.

The subject-matter of claim 6 according to the main request is thus based on an inventive step (Article 56 EPC).

3. The description was amended to reflect the subject-matter now claimed. No objections were raised by the appellant concerning these amendments.

4. Since the respondent's main request is allowable, there is no need to consider the auxiliary request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of the first instance with the order to maintain the patent on the basis of the following documents:
 - claims 1 to 6,
 - description pages 2 to 4,
 - drawing figures 1 to 5,all documents filed during the oral proceedings.

The Registrar:

The Chairman:

D. Meyfarth

W. Zellhuber

Decision electronically authenticated