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**D E C I S I O N**  
**of 24 April 2001**

**Case Number:** T 0312/98 - 3.2.6

**Application Number:** 91101644.2

**Publication Number:** 0442368

**IPC:** D02J 13/00

**Language of the proceedings:** EN

**Title of invention:**

An apparatus for heat treating a synthetic yarn

**Patentee:**

TEIJIN SEIKI, CO. LTD.

**Opponent:**

MURATA MACHINERY, LTD.

**Headword:**

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**Relevant legal provisions:**

EPC Art. 52(1), 54(1), 56, 100(a)(c), 123(2)

**Keyword:**

"Inventive step (main request) - no"

"Lack of disclosure in the application as filed (1st and 2nd auxiliary request) - yes"

"Novelty and inventive step (3rd auxiliary request) - yes"

**Decisions cited:**

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**Catchword:**

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Case Number: T 0312/98 - 3.2.6

**D E C I S I O N**  
**of the Technical Board of Appeal 3.2.6**  
**of 24 April 2001**

**Appellant:** TEIJIN SEIKI CO. Ltd.  
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**Representative:** Hoeger, Stellrecht & Partner  
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**Respondent:** MURATA MACHINERY, LTD.  
(Opponent) 136, Takeda-Mukaishiro cho., Fushimi-ku  
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**Representative:** Alber, Norbert, Dipl.-Ing.  
Patent- und Rechtsanwälte  
Hansmann, Vogeser, Dr. Boecker,  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 21 January 1998  
revoking European patent No. 0 442 368 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** P. Alting van Geusau  
**Members:** G. C. Kadner  
M. J. Vogel

## Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 442 368 in respect of European patent application No. 91 101 644.2 filed on 7 February 1991 was published on 20 September 1995. Independent claims 1 and 2 read as follows:

"1. An apparatus (3) for heat treating a synthetic yarn (Y) which comprises:  
a heater body (11, 21) for completely or partially encircling the synthetic yarn (Y), which is being false twisted or being drawn and false twisted, in a condition non-contacting therewith;  
a heating member (12, 22) disposed in said heater body (11, 21) for heating a heating wall of said heater body (11, 21) at a high temperature; and  
yarn guides (14, 24) disposed in a yarn passage surrounded by said heating wall of said heater body (11, 21)  
characterized in that said heater body (11, 21) and said heating member (12, 22) are longitudinally divided into at least two portions, and said heating member portions (12, 22) are electric heaters which are connected to a controller to independently control the heating of said electric heaters and the temperature of said respective yarn guides (14, 24).

2. An apparatus (3) for heat treating a synthetic yarn (Y) which comprises:  
a heater body (11, 21) for completely or partially encircling the synthetic yarn (Y), which is being false twisted or being drawn and false twisted, in a condition non-contacting therewith;  
and yarn guides (14, 24) disposed in a yarn passage of

said heater body characterized in that said yarn guides (14, 24) are provided with a yarn guide heating member (15) which is connected to a controller to control the temperature of said yarn guides (14, 24) independently from the temperature of said heater body (11, 21)."

II. Notice of opposition was filed on 20 June 1996 based on the grounds of Art 100 a) and c) EPC. In respect of an alleged lack of novelty and inventive step the opposition was supported by the following documents of the state of the art:

(D1) EP-A-0 332 227

(D2) DE-A-14 10 360

(D3) JP-U-54-131 059

(D4) JP-U-59-73 378

III. By decision posted on 21 January 1998 the Opposition Division revoked the European patent No. 0 442 368. The Opposition Division was of the opinion that neither the apparatus according to the granted claim 1 nor that of claim 1 of the auxiliary request filed during the oral proceedings held on 15 December 1997 involved an inventive step over the combination of teachings of D3 with D1 or D4.

IV. On 23 March 1998 a notice of appeal was lodged against this decision together with payment of the appeal fee.

The statement of grounds of appeal was filed on 22 May 1998.

V. In a submission in response to the appeal the Respondent (Opponent) relied additionally on the following documents:

(D5) JP-A-63-86-840

(D6b) EP-A-0 412 429.

(D6a) Application documents of DE 39 26 316

VI. In a communication sent together with the summons to attend oral proceedings, the Board expressed the preliminary opinion that D6b, representing a state of the art according to Article 54 (3) EPC, did not appear to be relevant in respect of novelty and should therefore be disregarded, and that D5 did not appear to lead a skilled person to the claimed subject-matter.

VII. Oral proceedings were held on 24 April 2001.

At the oral proceedings the Appellant (Patentee) filed claims 1 to 4, description pages 2 to 8 and figures 1 to 6 as a third auxiliary request.

The Appellant requested that the decision under appeal be set aside and that the patent be maintained as granted (main request), auxiliarily be maintained in amended form on the basis of claims 1 (first and second auxiliary request) filed on 22 May 1998 together with the statement of grounds of Appeal or on the basis of documents filed during the oral proceedings (third auxiliary request).

The Respondent (Opponent) requested that the appeal be dismissed.

The preamble of claim 1 being identical to that of the main request, the characterizing portions of the first and the second auxiliary requests read as follows:

First auxiliary request:

"... that said apparatus comprises a controller for setting of different heating conditions, said heater body (11, 21) and said heating member (12, 22) are longitudinally divided into at least two portions, and said heating member portions (12, 22) are electric heaters which are connected to a controller to independently control the heating of said electric heaters and the temperature of said respective yarn guides (14, 24) so as to provide a self-cleaning capability for the apparatus upon breakage of the yarn."

Second auxiliary request:

"... that said apparatus comprises a controller for setting of different heating conditions that said heater body (11, 21) and said heating member (12, 22) are longitudinally divided into at least two portions, and said heating member portions (12, 22) are electric heaters which are connected to a controller to independently control the heating of said electric heaters and the temperature of said respective yarn guides (14, 24), said controller allowing as well a setting of the heating conditions where the temperature of said yarn guides of one portion of the heater body is higher than 400°C as a setting where the temperature of the yarn guides of all portions of said heater body is higher

than 400°C."

Claim 1 of the third auxiliary request corresponds with claim 2 of the main request.

VIII. The submissions of the Appellant in support of its request are summarized as follows:

As was indicated in application D6a, in contrast to the claimed non-contacting heat treating apparatus the newly filed document D6b concerned a contacting heating device. In such a device the heat was transmitted by conduction from the heating surfaces 3 to the thread, the heat being allowed to be distributed over the cross section of the thread in the cold areas between the heated portions 2. The amount of heat transmitted by radiation was negligibly low when compared to the heat transmitted by contact. Regarding these different features and resulting different function, D6b which was a document according to Article 54(3) EPC and only to be considered in respect of novelty, should be disregarded.

Starting from the closest prior art which was represented by D1 a skilled person would not have been led to apply the measures of D3, in order to solve the underlying problem of widening the treating conditions. Each of D1 and D3 disclosed a complete solution of a technical problem and a skilled person had no reason to combine their teachings. Moreover D3 did not mention a controller to independently control the heating of the two divided heating portions.

The features of claim 1 of the first auxiliary request providing self-cleaning capability of the apparatus

upon breakage of the yarn were sufficiently disclosed in the description of the patent thus meeting the requirements of Article 123(2) EPC.

Regarding claim 1 of the second auxiliary request the self-cleaning capability was achieved by heating one or all portions of the heater to a temperature higher than 400°C. Particularly with respect to table 1 of D3 a decreasing yarn quality would have been expected when applying a higher temperature in the rear half of the heater. For these reasons the skilled person would not draw into consideration the combination of D1 with D3.

In any case, the subject-matter of claim 1 of the third auxiliary request fulfilled the criteria of patentability since none of the prior art documents disclosed yarn guides each provided with a separate heating member or could be considered as providing any suggestion in that direction.

IX. The Respondent essentially relied on the following submissions:

The heat transfer in the apparatus of the patent and that of D6b was partly caused by heat radiation and partly by heat transmission by conduction because the yarn guides of the patent compared with the heating surfaces of D6b also were heated to a high temperature. In the understanding of a skilled person contacting heaters and non-contacting heaters could not be separated to provide fully different technical solutions. Therefore D6b was relevant in respect of lack of novelty of the subject-matter of claim 1 of the main request.



Considering claim 1 of the first and second auxiliary request, the self-cleaning capability of the claimed apparatus was only the formulation of a problem, and no solution was given in respect of measures for achieving the self-cleaning effect. Furthermore self-cleaning capability by heating the device up to a temperature of 350°C to 800°C was already disclosed in D1, and did not involve an inventive step.

The third auxiliary request which was first presented during the oral proceedings was late filed and should therefore be rejected. However, no other objections were raised against this request.

### **Reasons for the Decision**

1. The appeal is admissible.
2. *Late filed documents D6a, D6b and D5*
  - 2.1 European patent application D6b is based on two priority dates, only the first of which (D6a) lies before the priority date of the patent in suit. Therefore the content of D6b that has to be taken into account for the provisions of Article 54(3) EPC only relates to that part covered by D6a.
  - 2.2 The Respondent was of the opinion that the device disclosed in document D6a could also be identified as a "non-contacting" heater. However, the Board cannot agree with this opinion for the following reasons:

With respect to Figure 1 of D6a it is stated that the

thread 7 is led over the lands (heating portions 2) which have a tray on their surface 3 (page 4, lines 4 to 9). In the last two lines of this paragraph it is stated that the thread has a good contact with the heating surfaces. Between the lands 2 the heater is covered with an isolator (page 5, line 2). A skilled person reading this text clearly recognizes that the heat transmission is intended to take place only between the thread and the heating surfaces since the isolator prevents heat transfer by radiation from the heating body 1 to the thread. To the skilled person it is also clear that the two different kinds of heaters i.e. the contacting heater type and non-contacting heater type are based on different physical effects of heat transport (conduction or radiation), and that all embodiments of the heater of D6a are unambiguously contacting devices. The Board is furthermore of the opinion that the "quasi-non-contacting" type of heater as shown in the Respondent's submission dated 16 March 2001 also falls into the category of the non-contacting type because the yarn guides have a small extension in the yarn direction and heat transmission by conduction between yarn guide and the thread in their contact area is negligible when compared with the heat transported by radiation.

2.3 Therefore the disclosure of D6b cannot put the novelty of the claimed subject-matter in doubt (Article 54(3) EPC) and consequently it should be disregarded.

2.4 The prior art disclosed in document D5 does not come closer to the subject-matter of each of claims 1 of the present requests than the disclosure of documents D1 to D4. In line with the case law of the Boards of Appeal the Board decided to disregard it under its

discretionary powers according to Article 114(2) EPC.

3. *Main request*

3.1 It was not contested that D1 discloses a non-contact heater for heat treating a synthetic yarn including the features of the preamble of claim 1 which comprises a primary heater 3 with yarn guides 15 positioned inside a groove 13 of said heater 3. The heater temperature can be set to a temperature from 350°C to 800°C, i.e. a controller must be present to control the temperature which is obviously effected in combination with the measurement 17 of the temperature inside the groove.

3.2 This device solves the problems of heat treating synthetic yarns at high processing speed with good results in crimpability and dyeability, avoiding ballooning of the yarn in the heater zone and providing a self-cleaning capability. Starting from D1 an objective underlying the patent in suit is to provide a heat treating apparatus of the kind by which wide treating conditions can be realized (page 3, lines 27, 28 of the patent in suit). This problem is solved by providing the known heater with the features of the characterizing portion of claim 1.

3.3 The skilled person, who is a textile engineer in the present case, easily recognizes that the heating device of D3 which is divided into two portions permits setting different temperatures in each portion of the heater. In this respect also tables 1 and 2 show that the temperature and thus the treating conditions can be varied. Although in the examples a filament yarn of only one particular denier number is treated, it is clear to a skilled person that lower or higher denier

yarns can be treated in the same manner but require different amounts of heat. Therefore D3 generally teaches division of a heating device into two portions each of which can be set to different temperatures. Thus by straightforward application of the teaching of D3 to the device of D1 the subject-matter of claim 1 is arrived at without the involvement of an inventive step (Article 56 EPC).

The Appellant's argument that there was no reason to combine the teachings of D1 with those of D3 is not convincing. Both prior art embodiments are included in the narrow field of non-contact heaters, and with regard to the underlying problem the skilled person would consider each of them as to whether their effects can contribute to the desired solution. Based on the knowledge in the art, the analysis of their respective teachings would lead at least to the testing of a combination, and by applying the teaching of D3 to that of D1 to the solution according to claim 1.

4. *First auxiliary request*

In the patent specification the provision of a self-cleaning capability for the apparatus upon breakage of the yarn is only disclosed in connection with the heating of yarn guides (14, 24) to a temperature of higher than 400°C by which the yarn adhered to the yarn guides can be vaporized in a short time (page 2, lines 9 to 11; page 4, lines 15 to 19; page 5, lines 44 to 47; page 6, lines 38 to 41; page 7, lines 25 to 28; page 8, lines 1 to 4). Claim 1 of the first auxiliary request includes the feature of the self-cleaning property by heating the yarn guides without any restriction as to which temperature is required for

achieving the self-cleaning effect. Since this effect was not disclosed independent of the temperature being higher than 400°C the claim is broadened with respect to the original disclosure to include other possibilities of self-cleaning not related to vaporisation of the yarn. Therefore claim 1 of the first auxiliary request is not admissible under Article 123(2) EPC.

5. *Second auxiliary request*

5.1 As set out in paragraph 3.3. above each control of the temperature of a heater requires a controller, at least in the form of a switch for connecting a resistance heating with a source of electricity. Therefore a controller is self-evidently present in the apparatus for heat treating of D3.

5.2 When the skilled person uses the apparatus for heat treating a synthetic yarn in wide treating conditions for which it is designed, e.g. for treating yarns of higher or lower denier value, it is clear that these different yarns require different heating conditions to allow the yarn temperature to be raised to the predetermined temperature at the exit of the heater. If a yarn of high denier value is to be treated the skilled person sets both portions of the heater to high temperatures, and vice versa only one of the heaters to high temperature and the second to a lower temperature when treating a low denier yarn, like e.g. it is done according to D3.

5.3 Having in mind the melting temperature of these yarns and the self-cleaning capability of the apparatus according to D1, it is evident that, if both heater

portions are operated at a temperature higher than the melting temperature of the yarn, both must be heated to a temperature of more than 400°C to maintain the self-cleaning property. On the other hand, if only one of the heaters is operated at a temperature higher than the melting temperature of the yarn, and the other one below this critical temperature, the self-cleaning effect is achieved by setting only the heater of higher temperature to more than 400°C.

5.4 For these reasons the Board considers the feature of setting only one portion or all portions of the heater of the claimed apparatus to a temperature of more than 400°C a measure following directly from the circumstances involved when heat treating synthetic yarn and therefore as not adding anything inventive to the subject-matter of claim 1.

6.1 *Admissibility of the third auxiliary request*

The Respondent objected to this auxiliary request as late filed because it was submitted during the oral proceedings. However, considering that this request differs from the main request essentially in that claim 1 was abandoned and independent claim 2 renumbered as new claim 1 thus relating to an independent claim which was included in the granted patent, the Respondent could not reasonably be surprised by this new request and the Board does not see any reason not to allow consideration of this request.

The amendments of the description and the drawings are caused by the cancellation of the embodiments covered by the abandoned granted claim 1. Since the Respondent

did not raise substantive objections against the amendments, and the Board does not see any violation of the provisions of Article 123(2) or (3) EPC the third auxiliary request is admissible.

## 6.2 Novelty

Novelty of the apparatus of claim 1 results already from the feature that each of its yarn guides are provided with a yarn guide heating member whereas none of the embodiments disclosed in D1 to D4 comprises such a yarn guide heating member (Article 54(1) EPC).

## 6.3 Inventive step

Starting from the closest prior art according to D1 the remaining objective of the apparatus claimed with claim 1 is the provision of a self-cleaning capability. The solution of that problem when starting from the closest prior art represented by D1, is achieved by providing the yarn guides with yarn guide heating members which are independent from the heating member of the heater body.

6.4 According to the disclosure of D1 the non-touch heater itself is heated to an elevated temperature in a range of 350°C to 800°C whereby the self-cleaning capability is effected by immediately burning up the yarn touching a heated surface. D1 does not disclose any incentive or hint to the claimed solution of providing the yarn guides themselves with additional yarn guide heating members, and therefore this measure is non-obvious over this prior art.

6.5 None of the further cited documents D2 to D4 (neither

D5, D6) disclose yarn guides provided with yarn guide heating members, and cannot contribute anything in the direction of the solution claimed. Consequently the subject-matter of claim 1 involves an inventive step (Article 56 EPC).

7. Summarizing, the Board arrives at the conclusion that the subject-matter of claim 1 of the third auxiliary request complies with the requirements of patentability according to Article 52(1) EPC. The dependent claims 2 to 4 which relate to further embodiments of the invention are equally acceptable.

The description and drawings are in agreement with the actual wording and scope of the current claims. Hence these documents are also suitable for maintenance of the patent in amended form.

Thus taking into account the amendments made by the appellant, the patent and the invention to which it relates meet the requirements of the EPC, and the patent as amended is maintained in this form (Article 102(3) EPC).

## **Order**

### **For these reasons it is decided that:**

1. The decision under appeal is set aside.
2. The main request and the first and second auxiliary requests are dismissed.
3. The case is remitted to the first instance with the



order to maintain the patent on the basis of the following documents of the third auxiliary request:

**Claims:** 1 to 4

**Description:** pages 2 to 8

**Drawings:** 4 sheets, Figures 1 to 6

all documents filed during the oral proceedings.

The Registrar:

The Chairman:

M. Patin

P. Alting van Geusau