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**D E C I S I O N**  
of 26 January 2000

**Case Number:** T 0910/94 - 3.2.6

**Application Number:** 87301372.6

**Publication Number:** 0234844

**IPC:** B65H 54/547

**Language of the proceedings:** EN

**Title of invention:**

Yarn winder

**Patentee:**

TORAY INDUSTRIES, INC.

**Opponent:**

Maschinenfabrik Rieter AG

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 56, 84

EPC R. 29(1)

**Keyword:**

"Claims - clarity (main request no)"

"Inventive step (first subsidiary request yes) after amendment"

**Decisions cited:**

T 0301/87

**Catchword:**



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Boards of Appeal

Chambres de recours

Case Number: T 0910/94 - 3.2.6

**D E C I S I O N**  
**of the Technical Board of Appeal 3.2.6**  
**of 26 January 2000**

**Appellant:** Maschinenfabrik Rieter AG  
(Opponent) Postfach 250  
CH-8406 Winterthur (CH)

**Representative:** -

**Respondent:** TORAY INDUSTRIES, INC.  
(Proprietor of the patent) 2, Nihonbashi-Muromachi 2-chome  
Chuo-ku  
Tokyo 103 (JP)

**Representative:** Coleiro, Raymond  
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**Decision under appeal:** Interlocutory decision of the Opposition Division  
of the European Patent Office posted  
4 October 1994 concerning maintenance of European  
patent No. 0 234 844 in amended form.

**Composition of the Board:**

**Chairman:** P. Alting van Geusau  
**Members:** T. Kriner  
V. Di Cerbo

## Summary of facts and submissions

- I. The appellant (opponent) lodged an appeal, received at the EPO on 2 December 1994, against the interlocutory decision of the Opposition Division dispatched on 4 October 1994 which maintained the European patent No. 0 234 844 in amended form. The appeal fee was paid simultaneously and statements setting out the grounds of appeal were received at the EPO on 30 January 1995 and on 6 February 1995.
- II. Opposition was filed against the patent as a whole and based on Article 100(a) EPC. The Opposition Division held that the grounds for opposition cited in Article 100(a) EPC did not prejudice the maintenance of the patent in the amended version submitted finally as the main request during the oral proceedings of 6 July 1994, having regard in particular to the following documents:
- D1: US-A-4 575 015 & EP-A-0 167 708
  - D2: Translation of ISO 5406
  - D3: Schenk, Auswuchtpraxis Heft 8
  - D4: US-A-4 098 127.
- III. In addition to these documents, the following documents played a role in the appeal proceedings:
- D2A: ISO 5406
  - D7: Declaration of Mr Armin Wirtz including exhibits 1-10
  - D8: US-A-4 216 920
  - D9: US-A-4 033 519
  - D10: US-A-4 245 794

- D12: Schenck pamphlet A 1514
- D13: Schenck reference list
- D15: Barmag, Information Service Nr. 23, Oktober 1982
- D16: Barmag, Technical information SW46S, SW46R
- D17: Chemiefasern/Textilindustrie, Januar 1985,  
Seiten 23 - 27
- D18: Chemiefasern/Textilindustrie, Oktober 1985,  
Seiten 649 - 652
- D20: Textiltechnik, 35 (1985) 6, Seiten 298 - 300.

IV. Oral proceedings, took place on 26 January 2000.

The appellant requested that the decision under appeal be set aside and the patent in suit be revoked.

During the oral proceedings the respondent filed a main request including claims 1 to 10 and a first subsidiary request including claims 1 to 10 and description pages 2 to 13.

The respondent requested that the appeal be dismissed and the patent be maintained on the basis of the main request or the first subsidiary request filed at the oral proceedings or on the basis of the first subsidiary request filed on 23 December 1999 (new second subsidiary request).

V. Claim 1 of the main request reads as follows:

"A yarn winder comprising:

- (a) a base (9 or 121) mounted on a machine frame (13) for supporting a yarn take-up means, and
- (b) the yarn take-up means including
  - (b-1) a spindle driving mechanism (7, 8 or 119, 120)

mounted on the base,

- (b-2) a spindle (1 or 14) comprising
  - (b-2-1) a bobbin holding portion (2 or 102) including a first cylindrical hollow body (103), a cylindrical and substantially solid body (130) connected to the first cylindrical hollow body (103) and a second cylindrical hollow body (104) connected to the cylindrical solid body (130), and
  - (b-2-2) a shaft (4 or 105) extending from a center of the inner end of the cylindrical solid body (130) along the axis thereof through the interior of the second cylindrical hollow body (2 or 104) and projecting therefrom, the shaft (4 or 105) being connected to the spindle driving mechanism (7, 8 or 119, 120),
  - (b-3) bearing means (10a - 10c) for rotatably supporting the spindle (1 or 14) on the base (9 or 121),
  - (b-4) a bobbin holding mechanism (3) secured around the periphery of the bobbin holding portion (2 or 102), for detachably mounting thereon at least a bobbin (11a - 11d or 115a - 115d) for taking up a yarn, and
  - (b-5) a tubular supporting member (5 or 106) stationarily mounted on the base (9 or 121) in a cantilever manner for supporting the spindle (1 or 14), a free end of the tubular supporting member (5 or 106) projecting into the interior of the second cylindrical hollow body (2 or 104) and the spindle (1 or 14) being rotatably held by the tubular supporting member (5 or 106) by the bearing means (10a or 117a),

characterised in that:

- (c-1) a plurality of the yarn take-up means are mounted on the base (9 or 121), which is rotatable between

- a position where one of the yarn take-up means operates for executing a winding operation and another position where another one take-up means operates for executing a winding operation; and
- (c-2) the bobbin holding portion (2 or 102) of each the take-up means is more than 800 mm in length and
  - (c-3) has at least three groups of holes (12a - 12c) arranged in balance correcting planes (A-C) for the attachment of weights,
  - (c-4) by means of which the bobbin holding portion (2 or 102) may be dynamically balanced by field-balancing for reducing vibrations of the spindle (1 or 14) generated by the spindle,
  - (c-5) the balance correcting planes (A - C) being located at opposite ends (A, C) of the bobbin holding portion (2 or 102) and at least one intermediate position (B)."

Claim 1 of the first subsidiary request reads as follows:

"A yarn winder comprising:

- (a) a base (9 or 121) mounted on a machine frame (13) for supporting a yarn take-up means, and
- (b) the yarn take-up means including
  - (b-1) a spindle driving mechanism (7, 8 or 119, 120) mounted on the base,
  - (b-2) a spindle (1 or 14) comprising
    - (b-2-1) a bobbin holding portion (2 or 102) including a first cylindrical hollow body (103), a cylindrical and substantially solid body (130) connected to the first cylindrical hollow body (103) and a second cylindrical hollow body (104) connected to the cylindrical solid body (130), and

- (b-2-2) a shaft (4 or 105) extending from a center of the inner end of the cylindrical solid body (130) along the axis thereof through the interior of the second cylindrical hollow body (2 or 104) and projecting therefrom, the shaft (4 or 105) being connected to the spindle driving mechanism (7, 8 or 119, 120),
- (b-3) bearing means (10a - 10c) for rotatably supporting the spindle (1 or 14) on the base (9 or 121),
- (b-4) a bobbin holding mechanism (3) secured around the periphery of the bobbin holding portion (2 or 102), for detachably mounting thereon at least one bobbin (11a - 11d or 115a - 115d) for taking up a yarn, and
- (b-5) a tubular supporting member (5 or 106) stationarily mounted on the base (9 or 121) in a cantilever manner for supporting the spindle (1 or 14), a free end of the tubular supporting member (5 or 106) projecting into the interior of the second cylindrical hollow body (2 or 104) and the spindle (1 or 14) being rotatably held by the tubular supporting member (5 or 106) by the bearing means (10a or 117a),

characterised in that:

- (c-1) a plurality of the yarn take-up means are mounted on the base (9 or 121), which is rotatable between a position where one of the yarn take-up means operates for executing a winding operation and another position where another one take-up means operates for executing a winding operation; and
- (c-2) the bobbin holding portion (2 or 102) of each the take-up means is more than 800 mm in length and
- (c-3) has at least three groups of holes (12a - 12c) each group of holes (12a - 12c) being arranged in

balance correcting planes (A-C) and having the same phase arrangement in the respective plane, the holes being adapted for the attachment of weights,

(c-4) by means of which the bobbin holding portion (2 or 102) may be dynamically balanced by field-balancing for reducing vibrations generated by the spindle (1 or 14),

(c-5) the balance correcting planes (A - C) being located at opposite ends (A, C) of the bobbin holding portion (2 or 102) and at at least one intermediate position (B)."

Claim 1 of the second subsidiary request comprises all features of claim 1 according to the main request and, in addition to claim 1 of the main request, the following characterising feature:

(c-6) the wall thickness of the second cylindrical hollow body (104) is thicker in a region closer to the cylindrical solid body (130) and thinner in region farther therefrom."

VI. In support of its requests the appellant relied essentially on the following submissions.

The amended claim 1 according to the main request did not meet the requirements of Article 84 EPC, because the mere provision of holes as proposed in this claim could not solve a balancing problem.

Considering inventive step of the subject-matter claimed, the skilled person reading D1, a document which disclosed all features of the preamble of claim 1 according to any of the



present requests, would know that the spindle described in this document was intended for use in any known yarn winder, including a revolver winder as shown for example in D7 to D10 and D15 to D17. Therefore, a yarn winder comprising the combination of features (a) to (c-1) was implied by the disclosure of D1.

The use of long spindles or bobbin holding portions according to feature (c-2) was suggested for example in D15 to D18 and in view of the trend to a higher productivity, the selection of longer spindles could not be seen as involving an inventive step.

Furthermore when applying these teachings of the prior art, the skilled person was well aware of the fact that vibration problems could be expected when using long spindles, and that balancing techniques should be applied (see D7, D12, D13 or D20) in order to reduce the vibrations.

Therefore, it was obvious that the skilled person would select an appropriate balancing technology, if necessary with the help of a balancing expert, when developing a yarn winder with a long spindle. At least the balancing expert could be expected to know that a long spindle rotating at high speed was liable to act as a flexible rotor. Hence, in accordance with the teaching of D2A and D3 he would balance the spindles in at least three planes, whereby the use of a field balancing method for this purpose would be suggested by D4.

Therefore, no inventive activity was involved for arriving at the subject-matter of claim 1 according to the main request.

Considering claim 1 according to the first subsidiary request, the significance of the phase angles for the

balancing weights was stated in D2A (see in particular the paragraphs 7.3.4.2, 7.3.4.8 and annex A of this document). However, the provision of preselected holes for the attachment of weights in a rotor for carrying out field-balancing was not shown in the available documents.

VII. The respondent disputed the appellant's views. His arguments can be summarised as follows:

Even if all features of the present independent claims 1 were known per se, it would require a multiple selection of features to be included in the device according to D1 to arrive at the claimed yarn winder. As the selections would not be determined by a one-way situation, and as the combination of the claimed features would result in a synergistic effect with respect to an improved efficiency, the subject-matter of the present claims involved an inventive step.

With regard to the clarity objection, the conclusions drawn in the decision T 301/87 were relevant. According to this decision Article 102(3) EPC did not allow objections to be based upon Article 84 EPC, if such objections did not arise out of the amendments made.

As the feature concerning the holes was already comprised in claim 1 of the granted patent, the conclusions drawn in this decision applied.

### **Reasons for the decision**

1. The appeal is admissible.

2. *Main request*

2.1 Claim 1 according to this request differs from claim 1 as granted amongst others in that it is directed to a yarn winder comprising a plurality of yarn take-up means, wherein the bobbin holding portion of each of the take-up means is **more than 800 mm in length** (see feature c-2).

2.2 In the originally filed documents take-up means having a length of more than 800 mm in length were solely disclosed in connection with the description of the preferred embodiment, in particular as a first aspect of the invention (see page 9, lines 9 to 14). In accordance with this first aspect of the invention, field-balancing of the bobbin holding portion of such a long yarn take-up means requires the provision of at least three groups of holes for the attachment of weights, said holes being arranged in balance correcting planes located at opposite ends of the bobbin holding portion and at least one intermediate position, and said holes having the same phase arrangement in the respective balance correcting planes (see page 10, lines 2 to 12 of the originally filed description).

2.3 It is apparent from this information that for carrying out the field balancing technique, in addition to the position of the three planes, the phase-position of the holes for the attachment of the balancing weights must also be known. Namely, in contrast to the balancing techniques in which weights can be attached at any wanted phase position, the weights in accordance with the yarn winder claimed can only be attached to the holes and therefore the phase position of the holes must be known for calculation of a weight distribution of the balancing weights with respect to the phase of the holes.

In so far the description of the preferred embodiment includes all the essential parameters for carrying out field-balancing by reference to the holes for the attachment of weights being arranged in particular balance correcting planes **and** that the holes have the same phase arrangement in each plane. While it is further stated that the number of the holes, the type of the holes and the arrangement of the holes with respect to each other may vary (see page 10, lines 14 to 18), no exception is mentioned for the phase arrangement of the holes.

- 2.4 Although the respondent argued during the oral proceedings that limitation of the subject-matter of claim 1 to include the phase angle of the holes was not required because the skilled person would be able to calculate the weight distribution by other means, no evidence or arguments were provided as to how such calculation should be carried out without information concerning the phase positions of the holes.

Therefore in the absence of reasons why the balancing parameter concerning the phase arrangement of the holes should be considered redundant, and the fact that the subject-matter now claimed is disclosed as a combination of features including the phase arrangement of the holes, the Board is of the opinion that only the combination can be seen to be supported by the originally filed application documents.

2.5 The respondent's argument according to which the decision T 301/87 setting limits on the introduction of an objection under Article 84 EPC applied in the present case, is based on the assumption that this objection is merely related to the arrangement of holes as such.

However, claim 1 was amended such that it now relates to a preferred embodiment having a particular combination of features, which in accordance with the disclosure of the patent not only requires a particular arrangement of the holes, but also a known phase arrangement for the holes in all balancing correcting planes, so as to be able to calculate the weight distribution of the balancing weights during field-balancing.

Therefore, in the present case the amendment concerning the long spindle caused Article 84 EPC to be contravened, and it cannot be concluded from decision T 301/87 that this contravention is not to be considered.

2.6 Since claim 1 of the main request does not include the feature according to which the holes have a known phase arrangement, it does not meet the requirements of Article 84 EPC in respect of essential features of the invention now claimed.

Therefore, the main request is not allowable.

### 3. *First subsidiary request*

#### 3.1 Amendments

3.1.1 Features (a) to (b-4) of claim 1, as well as its feature (c-5) and that part of (c-4) according to which the bobbin

holding portion may be dynamically balanced by field balancing, correspond to the features of the originally filed claim 1. Feature (b-5) was comprised in originally filed claim 4 and the combination of the characterising features (c-1) to (c-5) was described with respect to the first aspect of the invention on pages 9 to 17 of the originally filed description in connection with figures 1 and 2 of the originally filed drawings.

Moreover, claim 1 according to the first auxiliary request includes all features of claim 1 of the patent specification and is restricted over this claim by features (b-5), (c-1), (c-2) and the features of (c-3) and (c-4) according to which the holes have the same phase arrangement in the respective planes and field-balancing is used for reducing vibrations generated by the spindle.

Dependent claims 3 to 10 correspond to originally filed claims 5, 7, 9, 11 to 14 and 6 and the features of claim 2 are disclosed in the originally filed description on page 9, line 28 to page 10, line 12.

The description has merely been amended in order to adapt it to the claims of the first subsidiary request and to correct some clerical errors.

Therefore, the first subsidiary request does not contain subject-matter which extends beyond the content of the application as filed and the claims are not amended in such a way as to extend the protection conferred.

- 3.1.2 Compared to claim 1 according to the main request, claim 1 according to the first subsidiary request comprises all essential features for balancing a bobbin holding portion

longer than 800 mm by field-balancing. Additionally, also claim 2 has been amended in order to clarify that the holes in the disc have the same phase arrangement as the holes in the other balance correcting planes.

Therefore, the objection under Article 84 EPC raised against claim 1 of the main request is no longer relevant for claim 1 according to the first auxiliary request.

3.1.3 In view of the above assessment, the amended documents according to the first subsidiary request do not give raise to objections under Articles 123(2), (3) and 84 EPC.

### 3.2 Novelty

3.2.1 The most relevant state of the art is disclosed in D1 (EP-A-0 167 708 only, because US-A-4 575 015 is no prior art). This document undisputedly shows a yarn winder as described in the preamble of claim 1.

3.2.2 The appellant's argument that D1 additionally discloses a revolver winder as described in feature (c-1) of the characterising portion of claim 1, is based on the assumption that this feature is implicit in D1.

However, D1 essentially refers to a spindle and is silent about the kind of yarn winder for which this spindle may be used. The only information given in D1 which implicitly discloses the combination of such a spindle and a yarn winder is the disclosure on page 1, lines 8 and 9, according to which the claimed bobbin holder is useful for coiling and feeding thread.

Documents D7 to D10 and D15 to D17 cited by the appellant

show that the use of a revolver mechanism in a yarn winder is well known. However, that does not mean that a winder comprising a revolver mechanism is implicitly disclosed in D1, because the combination of the spindle according to D1 with a revolver winder requires at least a selection of such a particular winder.

Therefore, in contradiction to the appellant's opinion, feature (c-1) is not disclosed in D1.

- 3.2.3 Furthermore, it is undisputed that D1 neither refers to a bobbin holding portion of more than 800 mm in length, nor to a balancing method for this element as defined in features (c-2) to (c-5) of the characterising portion of claim 1.

All further documents cited in the appeal proceedings are less relevant than D1. Novelty of the subject-matter of claim 1 is therefore established.

### 3.3 Inventive step

- 3.3.1 On the basis of a yarn winder according to D1, the problem to be solved may be regarded as to improve the productivity of such a known yarn winder (see patent specification, page 2, lines 21 to 26).

This problem is solved by the provision of a plurality of yarn take-up means provided on a rotatable base and the selection of bobbin holding portions of more than 800 mm in length (features c-1 and c-2) as well as measures to make them suitable for high speed operation.

Since yarn take-up means having long bobbin holding portions tend to vibrate when they are rotating (see patent



specification, page 2, lines 30, 31), high speed operation requires measures to reduce the vibrations caused by the yarn take-up means.

As to the latter aspect, the yarn winder defined in claim 1 includes at least three groups of holes, each group of holes being arranged in balance correcting planes located at opposite ends of the bobbin holding portion and at least one intermediate position, and each group of holes having the same phase arrangement in the respective plane, the holes being adapted for the attachment of weights, by means of which the bobbin holding portion may be dynamically balanced by field-balancing for reducing vibrations generated by the spindle (features c-3 to c-5).

3.3.2 Starting from D1, it requires a plurality of selections to arrive at the yarn winder as defined in claim 1. In particular the winder type has to be selected, the length of the spindles, a balancing method for the spindles, an arrangement for balancing weights, and means for attaching the balancing weights to the spindles.

The revolver winder selected according to feature (c-1) of claim 1 is well known, as for example shown by documents D7 to D10 and D15 to D17.

D16 additionally describes the use of bobbin holding portions of more than 800 mm in such a revolver winder according to feature (c-2).

With respect to the selection of a balancing method according to features (c-3) to (c-5), D2A teaches (see particularly, paragraph 4.6) that

- balancing weights have to be fixed at the periphery of the rotor in discrete balancing planes,
- the amount of balance correcting planes has to be selected amongst others in dependence of the type of the rotor (rigid or flexible) and on its operating speed,
- the balance correcting planes have to be positioned in dependence of the particular rotor (for example in the case of three planes at the opposite ends and an intermediate position of the rotor).

Furthermore, D4 shows that a rotor may be balanced by field-balancing.

Therefore, the features (c-1), (c-2), (c-4) and (c-5) are well known in the art and **could** be selected by the skilled person for a yarn winder according to D1.

3.3.3 However, no reason is apparent why the skilled person **would** select precisely this combination of features to solve the productivity problem mentioned above.

Although it is generally accepted that revolver winders having long spindles may lead to high productivity, there is no suggestion given in the available documents which would lead the skilled person to consider the spindle arrangement of D1, revolver winders having long spindles and the selection of measures making the winder particularly suitable for field-balancing, in combination.

The skilled person could select other methods for reducing the vibrations, as for example constructional measures or damping means, or simply select some other balancing method

than field-balancing.

Hence, the plurality of selections according to claim 1 is not determined by a one-way situation, and their combination is not regarded as obvious.

- 3.3.4 Furthermore, as it was admitted by the appellant, there is no suggestion in the available prior art to provide groups of holes in discrete balance correcting planes of a rotor, which holes have the same phase arrangement in each plane and are adapted for the attachment of weights, in order to enable and facilitate field-balancing of the rotor.

Therefore, the skilled person had at least no suggestion for the particular arrangement of the holes as defined in feature (c-3).

4. The Board therefore comes to the conclusion that the subject-matter of claim 1 according to the respondent's first subsidiary request cannot be derived in an obvious manner from the cited prior art and accordingly involves an inventive step (Article 56 EPC). This claim together with its dependent claims 2 to 10 and the amended description and drawings therefore form a suitable basis for maintenance of the patent in amended form.

5. *Second subsidiary request*

As the respondent's first subsidiary request is considered allowable, there is no need to consider the second subsidiary request.

**Order**

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

1. The decision under appeal is set aside.
2. The main request is rejected.
3. The case is remitted to the first instance with the order to maintain the patent on the basis of the following documents:

**Claims:** 1 - 10 of the first subsidiary request filed at the oral proceedings on 26 January 2000

**Description:** pages 2 to 13 filed at the oral proceedings on 26 January 2000

**Drawings:** figures 1 to 20 as granted

The Registrar:

The Chairman:

M. Patin

P. Alting van Geusau

