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Datasheet for the decision of 13 October 2010

Case Number: T 2033/07 - 3.4.02

Application Number: 00975641.2

Publication Number: 1144983

IPC: G01N 21/00

Language of the proceedings: EN

Title of invention:
Article irradiation system in which article transporting conveyor is closely encompassed by shielding material

Patentee:
THE TITAN CORPORATION

Opponent:
ION BEAM APPLICATIONS S.A.

Headword:
-

Relevant legal provisions:
EPC Art. 123(2)

Relevant legal provisions (EPC 1973):
EPC Art. 54(1), 56

Keyword:
"Added subject-matter (no)"
"Novelty and inventive step (yes - amended claims)"

Decisions cited:
-

Catchword:
-

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Case Number: T 2033/07 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 13 October 2010

Appellant: (Opponent)
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Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 26 October 2007 concerning maintenance of European patent No. 1144983 in amended form.

Composition of the Board:

Chairman: A. G. Klein
Members: F. J. Narganes-Quijano
B. Müller

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the interlocutory decision of the opposition division finding European patent No. 1144983 (based on the European patent application No. 00975641.2 published with the International Publication No. WO 01/25754) as amended by the respondent (patent proprietor) according to the second auxiliary request filed during the first-instance oral proceedings to meet the requirements of the EPC.

The opposition filed by the appellant was based on the grounds for opposition of lack of novelty and lack of inventive step (Article 100(a) EPC 1973) and of added subject-matter (Article 100(c) EPC 1973).

II. In its decision the opposition division found *inter alia* that the patent as amended according to the second auxiliary request satisfied the requirements of Article 123(2) EPC 1973 and that the claimed subject-matter was novel and involved an inventive step.

III. Among the documents considered during the first-instance proceedings, the following have been considered by the parties during the appeal proceedings:

D1 : "Use of a linear accelerator for decontamination of deboned poultry meat", T. Sadat *et al.*, Radiat. Phys. Com., Vol. 36 (1990), pages 661 to 665

D3 : "A state of the art electron beam sterilization facility", J. L. Hackett, Radiat. Phys. Chem., Vol. 52 (1998), pages 491 to 494

D4 : "Electron beam sterilization technology", J. H. Bly, Radiat. Phys. Chem., Vol. 14 (1979), pages 403 to 414.

IV. With the statement setting out the grounds of appeal the appellant invoked the public prior use of a sterilization installation and submitted the following document in support of the alleged public prior use:

D10: "Centre de Traitement Ionmed - Specifications techniques de besoins - Lot E - Convoyeur", COFRAR Consulting Engineer (FR), 27.08.1996; pages 20 and 21 and a drawing sheet.

V. The Board issued a summons to attend oral proceedings together with a communication dealing with some of the issues addressed by the parties.

In reply to the summons, the appellant filed document

D10': declaration by M. Morales (Ionisos Ibérica, former Ionmed Esterilización), dated 13 September 2010,

and the respondent submitted with the letter dated 13 September 2010 new sets of claims amended according to a main and four auxiliary requests.

VI. Oral proceedings were held before the Board on 13 October 2010.

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

The respondent withdrew the request previously formulated during the written proceedings that the appeal be rejected as inadmissible, and requested that the patent be maintained on the basis of the main request or any of the four auxiliary requests, with amendments to the second auxiliary request to be filed during the oral proceedings, should this request become relevant.

At the end of the oral proceedings the Board gave its decision as set out in the Order below.

VII. Independent claims 1 and 18 amended according to the present main request of the respondent read as follows:

" 1. A system for irradiating articles having a first side and a second side opposite the first side, including,

a radiation source (129) constructed to provide radiation,

a first conveyor system (139) movable in a loop past the radiation source and constructed to carry the articles from a position in front of the radiation source to a position past the radiation source for the irradiation of the first side of the articles by the radiation source, the loop having curved portions and defining a space within the loop,

a loading area (106) disposed relative to the first conveyor system to provide articles to the first conveyor system,

an unloading area (110) disposed relative to the first conveyor system to receive articles from the first conveyor system,

a second conveyor system (142) connected within the loop to the first conveyor system between a position past the radiation source and a position in front of the radiation source and constructed to receive the articles from the first conveyor system after the irradiation of the first side of the articles by the source and to rotate the received articles through an angle of substantially 180° and to transfer the rotated articles to the first conveyor system for the movement of the articles past the radiation source to obtain an irradiation of the second side of articles by the radiation source,

radiation shielding material (132) disposed within the loop relative to the first conveyor system and the second conveyor system and the loading and unloading areas for isolating the second conveyor system and the loading and unloading areas from the radiation from the source, the radiation shielding material substantially filling the space within the loop, and

the second conveyor system and the loading and unloading areas being free of radiation and free of radiation shielding material."

" 18. A method of irradiating articles having first and second opposite sides, including the steps of:

providing a radiation source in a target region,

providing a loading area,

providing an unloading area relative to the loading area for a transfer of the articles from the loading area to the unloading area,

providing a movement of the articles in a loop from the loading area through the target region to the unloading area to obtain an irradiation by the source

of the first side of the articles, the loop having curved portions and defining a space within the loop,

providing radiation shielding material in the space within the loop to produce, within the loop, spaces free of radiation at positions between the target region and the loading and unloading areas, the radiation shielding material substantially filling the space within the loop, and

disposing a reroute conveyor system, free of radiation shielding material and free of radiation, at one of the spaces, free of radiation, between the target region and the loading and unloading areas to provide for a transfer of the articles from the loop to the reroute conveyor system after the irradiation of the first side of the articles by the radiation source, a rotation of the transferred articles through an angle of substantially 180°, and a transfer of the rotated articles to the loop for an irradiation of the second side of the articles by the radiation source,

the loading area and the unloading area also being disposed at positions free of radiation and radiation shielding material."

The main request also includes dependent claims 2 to 17 and 19 to 27 referring back to claims 1 and 18, respectively.

The wording of the claims of the auxiliary requests is not relevant for the present decision.

VIII. The arguments submitted by the appellant in support of its request, in as far as relevant for the present decision, are essentially the following:

There is no support in the application as published for the subject-matter of claim 1, and the combination of features defined in this claim constitutes an unallowable intermediate generalization. In particular, independent claim 27 of the application appears to be the closest, but the claimed features relating to the loading and unloading areas being free of radiation and of radiation shielding material were not mentioned in this claim, and dependent claim 29 required shielding material outside of the loop for shielding the second conveyor. Neither independent claim 36 nor dependent claims 37 to 43 as published specify that the second conveyor is free of shielding material. As regards the paragraph bridging pages 4 and 5 of the application, claim 1 contains features extracted from this paragraph without however requiring the remaining features specified therein such as the curved and straight portions of the conveyor. Claim 1 is supposed to be directed to the embodiment of Figure 6, but the claim fails to specify essential features of the embodiment such as the rods 134, the chamber 146 and the members 150 and 152 (paragraph bridging pages 16 and 17 of the application) which also contribute to achieving that the second conveyor is shielded from radiation without itself having shielding material. As acknowledged by the respondent, neither Figures 1 to 5 nor Figure 7 constitute embodiments of the claimed invention. Thus, claim 1 results from an unallowable combination of isolated features extracted from different embodiments originally disclosed such as those represented in Figures 6 and 7.

Similar considerations apply to method claim 18. In particular, independent method claim 48 of the

application required features such as the provision of article carriers and the contiguous relationship of the loading and unloading areas that have been omitted in present claim 18. In addition, present claim 18 is not directed to a method of providing a system as that defined in claim 1, but to a method of irradiating articles.

Claim 1 is anticipated by the disclosure of document D1 relating to Figures 1 and 2. In Figure 1 there is shown a "turning over device" and an arrow indicating that the one-side radiated articles are rerouted to the main conveyor. The document does not specify the location of the second conveyor, but the document envisages each of the two possible locations, i.e. inside and outside the facility delimited by walls of concrete.

Claim 1 is also anticipated by each of documents D3 and D4. In D3 the articles are turned over in the second pass (Figure 1 and page 494, third paragraph), and in D4 the rotator is positioned at the junction of the first and the second conveyors (Figure 6 and central paragraph on page 408). The purpose of the concrete material within the loop is shielding the radiation (D3, page 493, first lines) and this technical function depends not only on the amount of material filling the space within the loop, but also on the material; thus, as illustrated by documents on the file, it belongs to the common general knowledge of the skilled person to select the appropriate thickness of the shielding material depending on the type of material being used. It can therefore be considered that in both documents D3 and D4 the shielding material substantially fills

the inside of the loop within the meaning of the claimed invention.

Claim 1 is also anticipated by the public prior use of the installation represented in the drawing shown in document D10 and originating from the appellant. The installation was acquired by Ionmed in 1996, used to sterilize products, and made accessible to members of the public as shown in the declaration D10'. In this installation the products are rotated upside down, and also rotated in the plane of movement by the circulation of the products along the whole path determined by the two conveyors. In addition, claim 1 is not restricted to the second conveyor and the loading and unloading areas being shielded only by the shielding material within the loop, and therefore the claim does not exclude the additional shielding provided by the walls shown in document D10.

The closest state of the art is constituted by the facility disclosed in document D1. There are only two alternatives in D1 as regards the location of the second conveyor, i.e. either inside or outside the facility shown in Figure 2, it being noted that the figure is not intended to disclose all the features as stated on page 662 of the document, first column, middle paragraph. It would be obvious for the skilled person to arrange the second conveyor outside the facility and, if free access to the conveyor is required, at a location free of shielding material on the basis of the common general knowledge or of any of documents D3 and D4. In Figure 6 of document D4 the second conveyor is also outside the facility; the arrangement shown in this figure is not speculative

because the author of the document, a specialist in this field, was in a position to appropriately draw the essential features of the facility. In addition, rotating the articles while being rerouted constitutes an obvious technical measure.

Similar considerations apply to method claim 18.

IX. The arguments of the respondent in support of its requests can be summarized as follows:

The embodiment of Figure 6 of the application as originally filed shows that the shielding of the second conveyor and the loading and unloading areas is achieved by the shielding material within the loop alone. Independent claim 36 of the application contains no reference to the chamber, dependent claim 41 shows that the chamber is an optional feature, and the application as a whole shows that the chamber is not essential in achieving shielding of the relevant parts. As can be derived from the statements of the invention (page 1, second paragraph, and page 4, lines 21 to 27), it is implicit in the last paragraph of claim 36 that the second conveyor is free of shielding material.

Claim 18 is directed to the method corresponding to the device defined in claim 1. The carrier and the contiguous relationship of the loading and unloading areas specified in original claim 47 do not constitute essential features of the claimed method.

Figure 2 of document D1 shows only a partial, cut-away perspective view of a facility and does not show unambiguously that the shielding material substantially

fills the space within the loop. Figure 1 of this document shows that the articles are turned, but there is no disclosure of a second conveyor being used, let alone of its location or of it being free of shielding material. There is also no indication in Figure 2 regarding the location of the turning device.

In document D3 there is no disclosure of the shielding material substantially filling the space within the loop. In addition, the document discloses that the articles are turned over, but there is no indication as to how and at which point the articles are turned over.

In document D4 the space within the loop is not substantially filled with shielding material; in contrast, a large portion of the area within the loop is taken up by electron scanning equipment and by space allowing access for maintenance purposes. In addition, the second conveyor is surrounded by radiation shielding material on three of its four sides and is therefore not free of shielding material, and the document contains no details on the rotating device, at the most the document discloses positioning this device in the first conveyor before the articles reach the second conveyor (Figure 6).

In the installation shown in document D10 there are too many spaces free of shielding material within the loop to consider it as being substantially filled with shielding material and, in addition, the areas and the second conveyor are mainly shielded by material outside the loop. The articles are rotated upside down at the position "3", i.e. after having been rerouted, and the conveying path would not anticipate the rotation as

claimed because claim 1 requires rotation to obtain radiation of the second side. In any case, document D10 and the declaration D10' have been filed after the opposition period, the documents belong to the appellant itself and have been filed without justification for their late submission, it remains unclear what was rendered available to the public, and the installation is not more relevant than the documents on file. In these circumstances, the alleged prior use should not be admitted into the proceedings.

The purpose of the invention is to simplify and render compact the arrangement and to provide a second conveyor for both transferring and rotating the articles free of shielding material so that the conveyor is free for servicing, as shown in Figure 6 of the patent which exemplifies how far the shielding material is from the second conveyor.

Document D1 does not disclose any second conveyor, for reasons of efficiency such a conveyor would have to be placed inside the facility, and in any case there is no room outside the facility for receiving a second conveyor without positioning it close to the wall. In addition, in document D3 the second conveyor is located in the treatment area and the document suggests at the most the use of labyrinths to improve shielding (page 493), and in document D4 the second conveyor is not free of shielding material but surrounded by shielding material on three of its sides. In any case, the design shown in Figure 6 is unspecific and not reliable (central paragraph on page 408). Therefore, only hindsight knowledge of the claimed invention would

allow the skilled person to see in these documents a suggestion towards the claimed invention.

Reasons for the Decision

1. *Admissibility of the appeal*

With its letter of reply to the notice of appeal and to the statement of grounds of appeal filed by the appellant, the respondent objected under Rule 99(1) (a) and (b) EPC to the admissibility of the appeal and requested that the appeal be rejected as inadmissible pursuant to Rule 101(1) EPC. In the communication annexed to the summons to oral proceedings the Board gave its preliminary opinion on the issue of the admissibility of the appeal and subsequently, during the oral proceedings, the respondent withdrew its objections in this respect and also the request that the appeal be rejected as inadmissible (point VI above).

In these circumstances, and after consideration of the requirements of Article 107 EPC 1973 and Article 108 and Rule 99 EPC, the Board does not see any reason that would challenge the admissibility of the appeal.

The appeal is therefore admissible.

2. *Main request - Interpretation of claims 1 and 18*

Two different aspects of the subject-matter defined in independent claims 1 and 18 were addressed during the

written and the oral proceedings as regards their interpretation in the context of the claimed invention.

2.1 A first aspect relates to the question of whether and to what extent the claimed requirement that the second conveyor system is free of radiation and free of radiation shielding material is achieved by the claimed arrangement relating to the radiation shielding material disposed within the loop. This issue was already addressed by the Board in the communication annexed to the summons to oral proceedings and, after consideration of the subsequent written and oral submissions made by the parties with regard to claim 1 as amended according to the main request, the Board concludes that although the subject-matter of claim 1 does not exclude the provision of additional means (for example, in the form of radiation shielding material disposed outside the loop) that would further contribute to shielding the second conveyor system from unwanted radiation directed from the radiation source, either directly or after reflection, towards the second conveyor system, the subject-matter of claim 1 is to be interpreted in the sense that the functional features specified in the claim are effectively achieved, and therefore in the sense that the radiation shielding characteristics and the spatial distribution of the shielding material within the loop ensure alone a substantial shielding of the second conveyor system.

This interpretation is supported by the literal wording of claim 1 according to which the radiation shielding material "substantially" fills the space within the loop and "is disposed within the loop relative to" the other structural elements of the system "for isolating

the second conveyor system" from the radiation from the source, and is in addition further supported by the statements of invention in the description (column 1, lines 12 to 17 and column 4, lines 3 to 7 and 27 to 29) and by the embodiment of the claimed invention disclosed in the patent specification (disclosure of Figure 6).

The same conclusion applies to method claim 27 since according to the wording of the claim the radiation shielding material fills "substantially" the space within the loop and is, in addition, disposed in the space within the loop "to produce, within the loop, spaces free of radiation at positions between the target region and the loading and unloading areas", and the reroute conveyor system is disposed at one of these spaces, i.e. "at one of the spaces, free of radiation, between the target region and the loading and unloading areas".

2.2 The second aspect relates to the feature of claim 1 according to which the "second conveyor system [is] constructed [...] to rotate the received articles through an angle of substantially 180°" and to the corresponding feature of independent method claim 18 relating to the provision of "a reroute conveyor system [...] to provide for [...] a rotation of the transferred articles through an angle of substantially 180°, and a transfer of the rotated articles to the loop".

As noted by the Board in the communication annexed to the summons, among the different possible arrangements that would enable during the second pass the

irradiation of the side of the article opposite the side irradiated in the first pass, the two following arrangements are pertinent for the purposes of the interpretation of the claimed subject-matter:

Arrangement (a): The articles conveyed along the loop are transferred from the loop into the transfer conveyor and then again into the loop by a transverse side movement of translation of the articles. In this arrangement, it is the transverse side movement together with the closed geometry of the whole circulation path which determine that an article irradiated a first time is rotated by an angle of 180° while being circulated along the loop, the transfer conveyor and again the loop so as to pass again the radiation station with the opposite side of the article facing the radiation source. Thus, in this arrangement the second conveyor system does not properly rotate the articles, but rather (as specified in the description in column 10, lines 30 to 33 and column 11, lines 13 to 17 with reference to Figure 5) "reorients the articles [...] by 180° with respect to the path of the first conveyor system". This arrangement leads to the irradiation of two opposite sides of the articles only when the direction of irradiation of the source is in the plane of movement of the articles.

Arrangement (b): The articles are actively rotated by 180° by a turning device while being conveyed. This arrangement would be required when the direction of irradiation of the source is perpendicular to the plane of movement of the articles (as required by present dependent claim 7, see also column 4, lines 16 to 18 of the patent specification), in which case the articles would have to be rotated by an angle of 180° around an axis in the plane of movement of the articles, but

would also be appropriate when the direction of irradiation is in the plane of movement of the articles and the articles are transferred to and from the second conveyor ahead in the conveying direction, in which case the articles would have to be rotated by an angle of 180° around an axis perpendicular to the plane of movement of the articles.

In the aforementioned communication the Board expressed its preliminary opinion that according to the literal and the technical meaning of the formulation of the then valid claims 1 and 18 the claimed invention would appear to operate according to arrangement (b). However, during the oral proceedings the respondent submitted that the claimed subject-matter was to be construed to include each of arrangements (a) and (b), and the appellant expressed doubts as to whether the claimed subject-matter could be construed as submitted by the respondent.

Nonetheless, as will become apparent below (see in particular points 4.1, 4.2, 4.3.1 and 5.4 below), the question of whether the subject-matter of claims 1 and 18 can only be construed as operating according to arrangement (b) or can also be construed as encompassing arrangement (a) has no impact on the issues to be decided in the present appeal and, in these circumstances, there is no need for the present Board to further address this issue, which therefore can be left open.

3. *Main request - Articles 100(c) EPC 1973 & 123(2) EPC*

3.1 The application as published was directed to a plurality of different embodiments (see in particular independent claims 1, 8, 15, 22, 27, 32, 36, 44 and 48 and the embodiments disclosed with reference to Figures 1 to 7 of the application as published) and, as regards claim 1 amended according to the present main request, the appellant has essentially submitted that the subject-matter of this claim results from an unallowable combination of features extracted from the different embodiments disclosed in the application as published.

However, as submitted by the respondent, the combination of features of claim 1 of the main request results from the combination of the subject-matter defined in independent claim 36 as published with features disclosed in connection with this subject-matter, the combination being in addition directed to the embodiment disclosed with reference to Figure 6 and being therefore also supported by the corresponding disclosure.

More particularly, independent claim 36 as published already specified explicitly the features relating to the provision of radiation shielding material substantially filling the space within the loop to prevent radiation from reaching the loading and unloading areas, these areas being in addition free of radiation shielding material. In addition, although not explicitly mentioned in claim 36 and the dependent claims referring back to it, also the second conveyor is free of radiation and free of radiation shielding

material, this feature being defined in the introductory part of the description of the application (page 1, lines 11 to 14) and also in the summary of the invention (page 4, lines 21 to 27, and page 5, lines 6 and 7) as one of the essential objects of the invention and being, in addition, supported by the disclosure of the embodiment shown in Figure 6 in which the radiation shielding of the second conveyor is essentially achieved by the shielding material substantially filling the space within the loop. In these circumstances, the submission of the appellant that the latter features have been extracted from other embodiments without however specifying in the resulting claim the remaining essential features of these specific embodiments fails to convince the Board.

The further submission of the appellant that the combination of features defined in present claim 1 omits features disclosed in the application as published as essential cannot be followed by the Board either. In particular, although some of the embodiments disclosed in the application require a chamber contributing to shielding the relevant parts, as submitted by the respondent with reference to dependent claim 46 as published, this chamber was also disclosed as optional and independent claim 36 as published did not specify any chamber as essential for achieving the claimed shielding arrangement. Similar comments apply with regard to the rods and other additional members disclosed with reference to the embodiment of Figure 6 (rods 134 and members 150 and 152) as further contributing to shielding radiation from the source, without however being essential in achieving the radiation shielding arrangement defined in claim 1 when

construed as indicated in point 2.1 above. As regards the feature specified in the summary of the invention (paragraphs bridging pages 4 and 5 of the publication of the application) relating to the loop having curved and straight portions, present claim 1 already requires that the main conveyor extends in the form of a loop, and the Board does not see in what respect the feature relating to the curved and straight portions of the loop - and defined in present dependent claims 2 and 3 - would constitute an essential feature of the claimed invention and more particularly of the claimed radiation shielding arrangement.

3.2 Independent claim 18 of the main request is directed to a method of irradiating articles having first and second opposite sides and the steps of the method are essentially in correspondence with the functional features of the different means constituting the system defined in claim 1. Therefore, claim 18 is essentially based on the same passages of the application as published on which present claim 1 is also based.

The submission of the appellant that independent claim 18 is directed to the method defined in independent claim 48 as published but fails to specify the article carriers and the contiguous relationship of the loading and unloading areas required by claim 48 as published is for the following reasons insufficient to conclude that present claim 18 constitutes an unallowable generalization of the content of the application as published. Firstly, no reason has been provided in support of the contention that these features would be essential for the claimed irradiation method. And secondly, the passages of the application

as filed on which present claim 1 is based require neither the use of article carriers for conveying the articles nor the contiguous relationship of the loading and unloading areas. In addition, as long as the irradiation system defined in claim 1 and the corresponding irradiation method defined in claim 18 are both essentially based on the same passages of the application as published, the fact that claim 18 is directed not to a method of providing a system such as the system defined in claim 1, but to a method of irradiating articles corresponding essentially to the operation of the system defined in claim 1, has - contrary to the appellant's submissions - no impact on the issues under consideration.

3.3 Having regard to the above, none of the submissions of the appellant allows the conclusion that the patent as amended according to the main request would be at variance with the requirements of Article 100(c) 1973 and/or Article 123(2) EPC.

4. *Main request - Novelty*

4.1 *Document D1*

Document D1 discloses a linear accelerator for decontamination of meat (title and abstract). Meat blocks are conveyed into an ionization facility delimited by thick concrete walls ensuring biological shielding, and the blocks pass beneath an electron beam accelerator for treatment of one of their sides and then are automatically turned upside down and passed again for treatment of the opposite side (page 662, section "SPI facility" and Figure 1). According to the

arrangement represented in Figure 2, the conveyor extends from a loading area 5 outside the facility into the facility, forms a conveying loop across the irradiation station, and exits the facility towards an unloading area adjacent the loading area, and the concrete walls of the facility have a thick projection filling, at least partially, the space within the loop.

According to the flow chart of the treatment cycle represented in Figure 1, after one side of the blocks has been treated, the blocks are turned upside down by a "turning over device" and then rerouted to the conveyor for the treatment of the opposite side. However, there is no disclosure in the document that this rerouting step is performed by a second conveyor as claimed, let alone that the turning over device and/or the means for rerouting the blocks to the conveyor for the second treatment pass are arranged at a location free of radiation and free of radiation shielding material as required by the subject-matter of claim 1. It also follows that, although in Figure 1 the loading and unloading areas are positioned outside the facility and can therefore be considered as being free of radiation and of radiation shielding material, no indication can be inferred from the document to the effect of filling the shielding concrete material within the loop to an extent sufficient to shield the turning over device and/or the rerouting means as required by the claimed subject-matter, irrespective of the extent to which in Figure 1 of the document the shielding concrete material fills the space within the loop.

Furthermore, as shown in Figure 2, the radiation treatment is carried out in the vertical direction and therefore treatment of two opposite sides of the blocks requires turning them upside-down (page 662, first column, middle paragraph), as also implied by the device referred to in Figure 1 and defined as a "turning over device", so that the system of document D1 appears to operate according to arrangement (b) mentioned in point 2.2 above. However, as there is no indication in the document of the location of the turning over device with respect to the main conveyor, no conclusion can be drawn from the disclosure of the document to the effect that the blocks are turned over while being rerouted to the main conveyor for the second treatment pass as required by the claimed subject-matter when construed according to arrangement (b).

Having regard to the above, the subject-matter of claim 1 of the main request is novel with regard to the disclosure of document D1.

4.2 *Documents D3 and D4*

Each of documents D3 and D4 discloses an electron beam sterilization facility comprising a chamber, a first conveyor in the form of a loop having a loading and an unloading end outside the chamber for conveying the articles through the electron beam source, and shielding material in the space within the loop (D3, Figure 1, abstract, page 492, fifth paragraph, and page 493, first paragraph, and D4, Figures 5 and 6 together with the corresponding description). According to these documents, the articles can be exposed on two

sides (D3, page 491, last paragraph, and D4, page 408, central paragraph), and for this purpose the articles, after having been exposed once, are rerouted by means of a second conveyor to the first conveyor and turned or rotated for enabling exposure of the other side of the articles during the second exposure pass (D3, Figure 1 and page 494, third paragraph, and D4, "product rotating device" in Figure 6).

However, document D3 merely specifies that the article to be exposed a second time is "turned over as it progresses through the system" (page 494, third paragraph) and Figure 1 does not provide any indication as to how, where and by what means the articles are turned over for enabling exposure of the second side of the articles. In particular, the geometry of the first and the second conveyors represented in Figure 1 is such that the articles having been exposed once would be transferred from the first conveyor to the second conveyor and then to the first conveyor in the direction of the leading end of the article, and not by a transverse side movement of translation as in arrangement (a) mentioned in point 2.2 above, and would therefore reach the exposure station with the same orientation relative to the radiation source as in the first pass, so that - contrary to the appellant's submissions - the circulation path determined by the two conveyors does not lead to the articles being rotated as required by the claimed subject-matter when construed according to arrangement (a) mentioned above. In addition, no disclosure can be found in document D3 relating to the provision of means for rotating the articles or to the location of these means, so that document D3 also fails to anticipate the features of

claim 1 relating to the rotation of the articles while being rerouted when construed according to arrangement (b).

Similar comments apply to the facility disclosed in document D4. More particularly, in Figure 6, a schematic representation of the facility, the "product rotating device" is symbolically represented by a small circle located in the path of the first conveyor adjacent to the junction between the two conveyors, and this schematic representation is an insufficient basis for determining whether the articles are rotated by the device before reaching the second conveyor or while being transferred to the second conveyor and, if at all, would rather point towards the first and not - as contended by the appellant - towards the second of these two alternatives.

Already for these reasons, and irrespective of whether or not in each of documents D3 and D4 the space within the loop is substantially filled by the radiation shielding material within the meaning of claim 1, the subject-matter of claim 1 is novel over the disclosure of each of documents D3 and D4.

4.3 *Alleged public prior use - Document D10*

4.3.1 According to the submissions of the appellant in respect of the alleged public prior use of the sterilisation installation "Ionmed" shown in document D10 and referred to in the declaration D10', the installation comprises a chamber enclosing a treatment station, and a main conveyor in the form of a loop for conveying the articles from a loading area in the

trailing portion of the conveyor to the treatment station and subsequently conveying the articles forward towards the leading portion of the conveyor, the installation further comprising a transfer conveyor bridging the leading and the trailing portions of the main conveyor for rerouting the articles from the leading to the trailing portion of the conveyor so that the articles are conveyed again to the treatment station. According to the schematic representation shown in the constructional drawing of document D10, the space within the loop includes a structured block of material and the trailing and leading portions of the conveyor extend along a corridor-like passageway defined by an angled wall structure of the chamber.

According to the disclosure of document D10 (last page, first two paragraphs) the articles having been treated on one side and requiring treatment of two sides are turned after the first pass by a turning device ("retourner 3") in order to enable treatment of the other one of the sides after they have been rerouted to the main conveyor by means of the transfer conveyor, i.e. the installation appears to operate according to arrangement (b) mentioned above. However, according to the drawing shown in document D10 the turning device 3 is disposed, not at the transfer conveyor, but at the leading portion of the main conveyor so that the articles are turned for the second treatment not while being transferred to the main conveyor as required by the subject-matter of claim 1 when construed according to arrangement (b), but after they have been transferred to it.

The appellant has submitted that the circulation path determined by the main and the transfer conveyors of the installation would have the effect of turning the articles according to arrangement (a) mentioned above, and that for this reason the installation anticipates the claimed features relating to the rotation of the articles. However, the turning operation submitted by the appellant would then result in the articles being turned in the horizontal plane of the installation (corresponding with the plane of movement of the articles), and since - as shown in the drawing of document D10 and as it can also be inferred from the provision of the turning device 3 - the articles are treated in the vertical direction, this turning operation would have no effect on the side of the articles being exposed to the treatment radiation. Accordingly, the turning operation in the horizontal plane of the installation submitted by the appellant cannot be identified with, and therefore does not anticipate the claimed rotation operation because claim 1 not only requires "to rotate the received articles through an angle of substantially 180°", but also requires that this rotation is carried out "to obtain an irradiation of the second side of the articles by the radiation source".

4.3.2 The Board concludes that the alleged public use of the installation shown in document D10 fails at least to anticipate the features of claim 1 relating to the rotation of the articles.

The same conclusion applies with regard to the subject-matter of independent claim 18 which requires "disposing a reroute conveyor system [...] to provide

for [...] a rotation of the transferred articles through an angle of substantially 180° and a transfer of the rotated articles to the loop for an irradiation of the second side of the articles" (page 7, lines 13 to 20).

In addition, the appellant made no submission with regard to the possible relevance of the alleged prior use for the issue of inventive step.

In these circumstances the Board concurs with the respondent that the relevance of the alleged public prior use does not go beyond that of the remaining documents already considered during the first-instance proceedings and also considered during the appeal proceedings, and that for this reason the alleged prior use originating from the appellant itself and submitted for the first time with the statement of grounds of appeal is, in the circumstances of the present case, not to be admitted into the proceedings pursuant to Article 12(4) of the Rules of Procedure of the Boards of Appeal together with Article 114(2) EPC 1973.

In view of the above, the remaining issues raised by the respondent with regard to the alleged prior use - and in particular the justification for the belated submissions and the public availability of the features of the alleged prior use - do not need to be addressed by the Board.

4.4 It follows from the above conclusions and considerations that none of the alternative lines of argument of the appellant is sufficient to challenge the novelty of the subject-matter of claim 1 of the

main request (Article 54(1) EPC 1973). The same applies to independent claim 18 directed to a method of irradiating articles, the steps of which being essentially in correspondence with the functional features of the different means of the system defined in claim 1, and to dependent claims 2 to 17 and 19 to 27 referring back to claims 1 and 18, respectively.

5. *Main request - Inventive step*

5.1 The line of argument of the appellant with regard to the issue of inventive step is based on document D1 as the closest state of the art. As concluded in point 4.1 above, the subject-matter of claim 1 construed as set out in point 2.1 above differs from the disclosure of document D1 at least in the claimed features relating to the provision of a second conveyor for carrying out the operation of rerouting the articles having been treated once on one of their sides to the main conveyor for the treatment of the opposite side, the second conveyor being positioned so that the radiation shielding material within the space within the loop shields the second conveyor from radiation from the source, and being arranged so as to be free of radiation and free of radiation shielding material.

5.2 The technical effect achieved by these distinguishing features is enabling the rerouting of the articles for the second pass to be free of radiation and free of radiation shielding material by the mere arrangement of the radiation shielding material within the space within the loop, with the consequent simplification of the system without however compromising the servicing accessibility of the rerouting arrangement.

The objective problem solved by the distinguishing features mentioned above over the disclosure of document D1 can therefore be seen in simplifying the radiation shielding arrangement without however compromising the servicing accessibility of the location at which the articles are rerouted for the second exposure pass.

5.3 The Board considers that the provision of a second conveyor for carrying out the rerouting of the articles for the second exposure pass is an obvious technical measure that the skilled person would consider when confronted with the objective problem formulated above, especially in view of documents D3 and D4 which disclose the use of a second conveyor for carrying out the rerouting operation. However, the arguments of the appellant are insufficient to conclude that the skilled person would arrive at the claimed radiation shielding arrangement.

In particular, in document D3 the articles are rerouted by means of a second conveyor arranged within the chamber of the installation (see point 4.2 above and Figure 1 of D3). Thus, this document would at the most suggest positioning the transfer conveyor within the installation disclosed in document D1, but not arranging it so as to be free of radiation and free of radiation shielding material according to the claimed radiation shielding arrangement.

As regards document D4, the Board notes that according to the authors of the document the drawing shown in Figure 6 is intended to represent an existing

sterilisation installation and that "since Raychem [Corp.] is reluctant to show pictures, or even a drawing of the installation, Figure 6 shows a linear accelerator installation for sterilization *after our own design thinking*" (page 408, central paragraph) [emphasis added]. Thus, the drawing shown in Figure 6 not only constitutes a purely schematic representation of an existing installation but, in addition, the representation only shows the "own design thinking" of the authors of the drawing and therefore does not constitute a faithful description of the existing installation. In view of the purely schematic and speculative nature of Figure 6 and in the absence of any other information concerning the public availability and the structural and functional features of the existing installation, the Board is reluctant to conclude that the skilled person confronted with the objective problem formulated above would have extracted any specific technical teaching from Figure 6 relating to the location of the second conveyor, let alone any specific technical function that would have pointed towards the claimed solution. In particular, in the absence of any corresponding indication in document D4, only hindsight knowledge of the claimed invention would suggest that the transfer conveyor represented in Figure 6 - which, as already pointed out by the respondent, appears to be surrounded by shielding material on three of its sides - has been purposely positioned in front of a wall of radiation shielding material interposed between the second conveyor and the central part of the loop formed by the main conveyor so as to be free of radiation and of radiation shielding material and so as to simplify the radiation shielding

arrangement while ensuring the servicing accessibility of the transfer conveyor.

The appellant has also referred to the common general knowledge of the skilled person. In the Board's view this common general knowledge would have prompted the skilled person to use - as already concluded above - a second conveyor for rerouting the articles but, in the absence of any evidence to the contrary, the common general knowledge is insufficient to conclude that the skilled person would in addition have arranged this rerouting conveyor in the specific way set out in the claim in order to solve the objective problem.

5.4 In view of the above, the Board concludes that the distinguishing features mentioned in point 5.1 above were not rendered obvious by the prior art indicated by the appellant and that for this reason, irrespective of whether or not the remaining distinguishing features identified in point 4.1 above are rendered obvious by the prior art, the submissions of the appellant are not sufficient to challenge the inventive step of the subject-matter of claim 1 of the main request (Article 56 EPC 1973).

The same applies to independent claim 18 directed to a method of irradiating articles and to dependent claims 2 to 17 and 19 to 27 referring back to claims 1 and 18, respectively.

6. In view of the above considerations and conclusions, the Board concluded during the oral proceedings that the patent amended according to the main request and the invention to which it relates meet the requirements

of the EPC and that consequently the patent was to be maintained as amended by the respondent according to the present main 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 first instance with the order to maintain the patent as amended in the following version:
   - description and drawings as annexed to the decision under appeal, and
   - claims 1 to 27 of the main request filed with the letter of 13 September 2010.

The Registrar: The Chairman:

M. Kiehl A. G. Klein