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Datasheet for the decision of 29 September 2016

Case Number: T 0934/14 - 3.2.01

Application Number: 04030127.7

Publication Number: 1588913

IPC: B60T8/36, B60T15/02, B60T13/66, B60T13/68

Language of the proceedings: EN

Title of invention:
An electro-pneumatic braking control unit for a railway or tramway vehicle

Patent Proprietor:
Faiveley Transport Italia S.p.A.

Opponent:
Knorr-Bremse Rail Systems (UK) Limited

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (yes)

Decisions cited:

Catchword:

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Case Number: T 0934/14 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 29 September 2016

Appellant: (Opponent)	Knorr-Bremse Rail Systems (UK) Limited Westinghouse Way Hampton Park East Melksham Wiltshire SN12 6TL (GB)
Representative:	Prüfer & Partner mbB Patentanwälte · Rechtsanwälte Sohnckestraße 12 81479 München (DE)
Respondent: (Patent Proprietor)	Faiveley Transport Italia S.p.A. Via Volvera 51 10045 Piossasco (TO) (IT)
Representative:	Quinterno, Giuseppe Jacobacci & Partners S.p.A. Corso Emilia 8 10152 Torino (IT)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 18 February 2014 rejecting the opposition filed against European patent No. 1588913 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	G. Pricolo
Members:	W. Marx
	O. Loizou
	Y. Lemblé
	S. Fernández de Córdoba

Summary of Facts and Submissions

I. The appeal is directed against the decision of the opposition division rejecting the opposition against European patent No. 1 588 913.

II. In its decision the opposition division held that the prior public use according to

O1: Exhibition of EP2002 valve at Innotrans 2002 from 24th-27th September 2002 in Berlin, comprising following documentary evidence relating to O1:
D3: Photograph of EP2002 at trade show
D4: Knorr-Bremse Informer published September 2002
D5: Labelled photograph of EP2002

belonged to the prior art according to Article 54(2) EPC and that the subject-matter of granted claim 1 was based on an inventive step starting from this closest prior art.

Moreover, the opposition found that document

D2: Component Overhaul Instruction dated April 1999

was not made available to the public prior to the priority date of the patent.

III. Together with its grounds of appeal the appellant filed further evidence to prove that multi-plate structures were part of the common general knowledge:

D12: US 5,803,124;
D13: US 6,234,191 B1;
D14: US 6,142,442;
D15: US 4,659,149;
D16: GB 1,117,185.

IV. Oral proceedings before the board took place on 29 September 2016.

The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed.

V. Claim 1 of the patent as granted reads as follows (broken into a feature analysis adopted by the parties):

An electro-pneumatic brake control unit for a railway or tram vehicle,

A) comprising a structure (3) of multi-layer type comprising a plurality of superimposed plates (10 - 12), and in particular

B) an upper layer (10) carrying and/or integrating a plurality of pneumatic, electro-pneumatic or electric components (RV; EV1-EV11; PS1-PS4; ...)

C1) and having a plurality of connection through holes (24)
C2) and associated coupling channels (23) provided in its lower face,

D) and a lower layer (12) which has through holes (20) for connection with corresponding apertures and/or coupling channels of the upper plate (10),

E) as well as associated coupling channels (21) arranged in its upper face;

the unit being **characterized in that**

F) the said structure (3) further includes an intermediate layer or plate (11) having a plurality of connection passages (22) in positions predetermined as a function of a pneumatic circuit to be formed, and **in that**

G) pneumatic and/or electro-pneumatic valve means such as a pneumatic relay valve (RV) are integrated in the said structure (3).

VI. The appellant (opponent) essentially argued as follows:

Only during the oral proceedings before the opposition division the opponent became aware that features C2 and E were considered not known from O1 and not obvious in view of the available documents, therefore D12 to D16 were not filed late. Moreover, these documents showed concrete examples for multi-layer structures of valve units comprising specific connection paths not discernible from O1, so they were highly relevant and should be admitted into the appeal proceedings.

The technical background was a high flow brake control valve for controlling pneumatic air pressure to the brake actuators. The brake valve assembly was provided with control valves piloted by low flow valves, usually solenoids. The brake valve was therefore a piloted amplifier comprising "amplification" valves internally, and fluid carrying bores, channels, cross drillings, connections or apertures or the like distinct from the through holes which were clearly present in O1 in order to functionally connect solenoids and valves in the assembly and the two pneumatic connections at the base

of the valve to form the high and low flow pneumatic circuits. Among the three ways of forming the necessary pneumatic connections within the valve block (casting, drilling, machining), the standard approach was to machine the passages into the surface of a plate. For shifting the line of fluid connection in a two-plate structure between two axially off-set bores, it was known to use channels formed in the connecting surface of one or both plates. If there was a joint between two pieces and no other reason for such a joint, the skilled person would expect to be there some sort of valve or part of a pneumatic circuit. In case of three pieces the skilled man would expect coupling channels between the first and second, and second and third pieces, respectively.

The closest prior art O1 disclosed an electro-pneumatic brake control unit comprising features A, B, C1, D, F and G. Valve "EP2002" presented at the "Innotrans 2002" was a black box, so it was not discernible where coupling channels were provided as required by features C2 and E. The skilled person recognised a multi-layer structure comprising three plates for connecting (electro-) pneumatic components on the upper plate with a pneumatic port at the lower plate. In order to function, through holes had to be provided in the upper and lower plate and connections in the intermediate plate. It was also obvious for the skilled person that this structure comprised a (electro-) pneumatic valve function and through holes in the upper and lower plate which were axially off-set, so that coupling channels were required. When establishing in a simple manner a pneumatic connection between these axially off-set through-holes, it was obvious to compensate for this misalignment at the interface between the plates by providing coupling channels. The simplest way to

produce the required connection was to provide the required coupling channels in the respective face of the upper and lower layer facing the intermediate layer. Moreover, it was simply a choice among the few options for a simple arrangement - i.e. coupling channels either in the intermediate plate, or on the lower face of the upper plate and on the upper face of the lower plate - which could not justify an inventive step. Such design or connecting structure within a multi-layer structure formed part of the common general knowledge (as demonstrated in D12 to D16). Forming passages in the faces of the lower and upper plate facing the intermediate plate was simply a matter of design choice in designing the pneumatic circuit and the obvious choice to make in most designs. Machining was the simplest option and was therefore chosen in D12 to D16, which were in the same field and for the same purpose. The description of the patent (see paragraph [0038]) did not claim that the arrangement had any advantage.

Moreover, the skilled person would take into account the teaching of D12, referring to pneumatic devices (column 1, line 60) showing a multi-layer structure with through-holes in the upper plate and coupling channels on its lower face, connections in the intermediate plate and coupling channels (P102, P104) on the upper face of the lower plate. Although the sectional drawings in D12 did not show through holes in the lower plate, through holes were either implicit or obvious to the skilled person. Similar considerations applied for a combination of O1 with D13, showing coupling channels at the inner side of plate 112. Further documents D14 to D16 also disclosed through holes and coupling channels provided in a plate's face.

Starting from D12 as the closest prior art, the drawings did not show an arrangement with valves. However, this missing feature was disclosed in the title of D12 and in column 1, line 60, so that an electro-pneumatic brake control unit comprising valve means - feature G - was not inventive.

In case D2 would be considered to belong to the prior art according to Article 54(2) EPC, remittal to the department of first instance was requested. Similarly to O1, D2 did not disclose features C2 or E that the upper and lower layers had associated coupling channels on their respective lower and upper faces. The features not found to be explicitly disclosed in either O1 or D2 were simple design choices and the obvious approach for the skilled man seeking to implement the necessary pneumatic circuit in the brake valve.

VII. The respondent's arguments relevant to the present decision can be summarized as follows:

Even if multi-plate structures in general were actually part of the common general knowledge, this would not necessarily involve that features C2 and E of claim 1 also belonged to the common general knowledge. Thus, a combination of O1 with common general knowledge would not yield the braking control unit defined in claim 1.

Documents D12 to D16 had been filed for the very first time in appeal proceedings. The opposition division had ascertained that the presentation at the Innotrans Exhibition 2002 of the valve assembly of O1 did not allow the skilled person to see the interior of said valve assembly and the construction of the internal pneumatic circuitry thereof. Thus, the skilled person was not prompted to adopt the specific solution defined

in claim 1. The five new documents were thus irrelevant with respect to the inventiveness issue because, irrespective of their content, in the instant case the skilled person would have had no reasons to specifically adopt any of the solutions disclosed therein. Being late-filed and irrelevant, D12 to D16 were believed to be inadmissible.

O1 only concerned the exhibition of a valve prototype to be inspected from the outside, i.e. related to a black box not revealing all details to the skilled person. The multi-layer structure of O1 was not necessarily for establishing horizontal connections, but might have been provided for other reasons. Therefore, the skilled person could not gather from O1 how the connections were provided. There existed many possibilities for providing connections (e.g. hoses, drilled holes), and there was no prompting for the skilled person to choose the claimed solution, or the specific solution as known from D12. Moreover, D12 only disclosed an upper plate with through holes and associated channels, whereas the lower plate only had fastening holes but no through holes for establishing a fluid connection, i.e. the solution known from D12 did not provide all the missing features. Pneumatic devices were coupled in D12 to the upper plate, and there was no information to have them integrated in the multi-layer structure. D13 did not show coupling channels in the upper plate, and many options were possible as demonstrated by D12 to D16.

D2 was not to be taken into account, for the reasons set forth in the appealed decision.

Reasons for the Decision

1. Inventive step (Article 56 EPC)

1.1 An electro-pneumatic brake control unit comprising a three-layer structure and pneumatic, electro-pneumatic or electric components mounted on top of the upper layer, as required by features A and B of claim 1 as granted, is known from O1 (see in particular drawing D5), which was considered in the contested decision to represent the closest prior art. Although no details regarding the internal structure of the black box shown in O1/D5 are visible, the board agrees with the appellant that through holes in the upper and lower layer and connection passages in the intermediate layer must be present in order for the unit to function, so that features C1, D, and F are implicitly known from O1/D5. The appellant also argues that this structure comprised a (electro-) pneumatic valve function so that feature G would also be realised, which was not contested by the respondent. However, as admitted by the appellant, coupling channels provided in the lower face of the upper layer and in the upper face of the lower layer, as required by features C2 and E, were not shown in O1.

1.2 Coupling channels associated with the respective through holes according to features C2 and E are necessary for establishing a connection of the through holes in the upper and lower layer with apertures in the intermediate layer not being aligned with said through holes. The problem to be solved is therefore seen in compensating for the misalignment of apertures in the three-layer structure.

The board notes that the formulation of the problem as stated by the appellant, i.e. establishing in a simple manner a pneumatic connection between axially off-set through holes, starts from the unfounded assumption that a further feature would be derivable from O1/D5, namely that the through holes in the upper and lower layer were axially off-set, for which there is no basis in O1/D5. As argued above, it can only implicitly assumed that the unit shown in O1/D5 will have through holes in the upper and lower layer for it to function, without knowing the exact positioning of these through holes in relation to the horizontal plane of the upper and lower layer.

1.3 The skilled person starting from O1/D5 can follow the appellant in that the misalignment of apertures in different layers requires coupling channels to establish a fluidic connection. However, since O1/D5 only shows a black box without revealing details about its internal structure, e.g. where the valve means according to feature G is situated, there is no indication for the skilled person which interface or joint between two layers requires a coupling channel, even assuming that it would be obvious to provide a coupling channel by machining a passage into the surface of one of the plates. In particular, following the argument of the appellant that a joint between two plates or layers would be an indication to expect there some sort of valve **or** part of a pneumatic circuit, it might be assumed that one of the two joints in the three-layer structure of O1/D5 merely serves as an interface for mounting valves, not necessarily implying that any coupling channel in the horizontal plane would be necessary. Therefore, starting from O1/D5 and trying to solve the problem stated above, the board does not consider it an obvious solution for the skilled person

to provide coupling channels in both interfaces between the intermediate layer and the upper and the lower layer, as required by features C2 and E.

The crucial factor for the assessment of inventive step in the present case is not whether it would be the simplest way to provide coupling channels in the respective faces of the upper and lower layer facing the intermediate layer, or whether it would be a mere matter of design choice among some few possibilities where a coupling channel could be provided at the joint of two adjacent plates or layers, as argued by the appellant. What is important is whether the skilled person would contemplate at all, starting from the construction as disclosed in O1/D5 without further details on its inner structure, to provide coupling channels at both joints between the upper and the lower layer and the intermediate layer. As demonstrated above, there is no prompting for the skilled person to choose the claimed solution of providing coupling channels in both joints of the three-layer structure of O1/D5.

The appellant also argued that the description of the patent did not claim that the arrangement had any advantage. This can not be followed by the board, since it is stated e.g. in paragraph [0028] that the intermediate plate can be defined as a "personalisation plate", having a different number of piercings in different positions for the purpose of achieving different modes of interconnection between the pneumatic and electro-pneumatic devices carried by the upper plate, to form different pneumatic circuits.

1.4 Also taking into account the teaching of one of the documents D12 to D16, which were filed as evidence of

the common general knowledge, the board again finds that without knowing - apart from through holes and connection passages required for the brake control unit to function - further details about the interior of the brake control unit disclosed in O1/D5, there is no motivation and therefore no reason for the skilled person to adopt any of the solutions disclosed in D12 to D16.

D12 might show coupling channels in the lower face of the upper plate and coupling channels in the upper face of the lower plate for a manifold having a three-layer structure. But without knowing whether a problem of misalignment exists in both joining interfaces of the three plates known from O1/D5, the skilled person would not be prompted to provide coupling channels in both joining interfaces simply because it was known from D12. As argued above, one of the two joints in the three-layer structure of O1/D5 might merely serve as an interface for mounting valves.

Document D13 only shows coupling channels at the inner side of one of the two outer plates of a three-layer structure. Therefore, D13 already fails to provide a hint to the solution according to features C2 and E to provide coupling channels at the inner sides of both outer plates. As regards D14 to D16, the board cannot see that either coupling channels are provided at both outer plates or even at one of the outer plates, and the appellant has not provided further substantiation in this respect.

1.5 The appellant has also argued lack of inventive step starting from document D12 as the closest prior art.

D12 shows a manifold for rail vehicle brakes, i.e. a structure including pneumatic chambers and passages connecting ports at the exterior faces where pneumatic devices, sources of pneumatic fluid and pneumatic circuits are to be connected (see column 1, lines 60 to 62). The three-layer structure as known from D12 (see Figures 5 to 7) shows an upper plate having a plurality of connection through holes and associated coupling channels in its lower face, an intermediate plate, and also coupling channels in the upper face of a lower plate, i.e. features A, B, C1, C2, E and F of claim 1 as granted. Through holes in the lower plate as required by feature D might at least be obvious when providing pneumatic devices at the exterior face of the lower plate.

However, the board cannot see that the skilled person starting from D12 would contemplate integrating valve means in the three-layer structure of D12, as required by feature G. The whole teaching of D12 is about manifolds - i.e. a device for distributing air - and a rather flat structure including thin plates (see Figures; also e.g. column 4, lines 46 to 49), which would prevent the skilled person from integrating valves at a joint between two layers or within one of the layers. Moreover, the board cannot find any indication in the title of D12 or in the passage cited by the appellant which would prompt the skilled person to provide an electro-pneumatic brake control unit with valves integrated in the manifold of D12.

1.6 Finally, the appellant alleges lack of inventive step starting from D2 as closest prior art.

According to the contested decision, document D2 has not been acknowledged to belong to the prior art

according to Article 54(2) EPC. The board finds that, irrespective of whether the contested decision has to be overturned in this respect, D2 does not show more than what is already disclosed in O1/D5. As agreed by the appellant, also D2 fails to show features C2 and E. Since the inventive step of the solution according to granted claim 1 could not be challenged starting from O1/D5 due these distinguishing features, the board cannot see why the situation should differ when starting from D2 as the closest prior art document. Moreover, the appellant did not put forward additional arguments in this respect.

1.7 It follows from the foregoing that it is not obvious to a person skilled in the art to arrive at the claimed solution, starting from either O1/D5 or D12 or D2 as the closest prior art, taking into account the common general knowledge and also the teaching of D12 to D16. The invention as specified in claim 1 as granted therefore involves an inventive step (Article 56 EPC).

2. As shown above, the teachings of D12 to D16 could not challenge the inventiveness of the subject-matter of granted claim 1, so the issues of late-filing, relevance and admissibility of these documents need not to be addressed.

3. Moreover, since D2 represented a starting point similar to that of O1/D5 for assessing inventive step and therefore the board had to reach the same conclusion that the subject-matter of granted claim 1 also was inventive when assuming D2 to be the closest prior art, the issue of whether D2 belonged to the prior art according to Article 54(2) EPC could be left open. Therefore the request of the appellant to have the case remitted is refused.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Vottner G. Pricolo

Decision electronically authenticated