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**Datasheet for the decision  
of 18 March 2010**

**Case Number:** T 0363/08 - 3.2.03

**Application Number:** 97901763.9

**Publication Number:** 0819795

**IPC:** E02F 9/22, F15B 11/00

**Language of the proceedings:** EN

**Title of invention:**  
Hydraulic circuit for hydraulic machine

**Patentee:**  
Nabtesco Corporation

**Opponent:**  
WMC Matthes Consulting

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 56

**Relevant legal provisions (EPC 1973):**  
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**Keyword:**  
"Inventive step (yes)"

**Decisions cited:**  
-

**Catchword:**  
-



Case Number: T 0363/08 - 3.2.03

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.03  
of 18 March 2010

**Appellant:**  
(Opponent) WMC Matthes Consulting  
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**Representative:** Weber, Joachim  
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**Respondent:**  
(Patent Proprietor) Nabtesco Corporation  
9-18 Kaigan, 1-chome  
Minato-ku  
Tokyo (JP)

**Representative:** Smith, Norman Ian  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 10 December 2007  
rejecting the opposition filed against European  
patent No. 0819795 pursuant to Article 102(2)  
EPC.

**Composition of the Board:**

**Chairman:** U. Krause  
**Members:** G. Ashley  
K. Garnett

## Summary of Facts and Submissions

I. European patent EP-B1-0 819 795 relates to a hydraulic circuit having a safety locking means; such circuits are typically used in vehicles in the construction industry. Grant of the patent was opposed on the grounds that the claimed subject matter was not novel and did not involve an inventive step (Article 100(b) EPC), that the patent did not disclose the invention sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) EPC) and that the subject-matter of the granted patent extended beyond the content of the application as originally filed (Article 100(c) EPC).

II. The Opposition Division concluded that none of the cited grounds of opposition prejudiced the patent as granted, and hence took the decision, posted on 10 December 2007, to reject the opposition.

III. The Appellant (Opponent) filed notice of appeal on 6 February 2008, paying the appeal fee on the same day. A statement containing the grounds of appeal was submitted on 25 March 2008. Oral proceedings were held on 18 March 2010.

IV. Requests

The Appellant requests that the above decision be set aside and that the patent be revoked.

The Respondent (Patent Proprietor) requests that the appeal be dismissed.

V. Claim

The granted patent contains the following claim:

"1. A hydraulic circuit for hydraulic equipment, which circuit is arranged to feed pressurized hydraulic fluid from a pressurized hydraulic fluid source through control valves (17,18,19,21,22,23R,23L,25,26) to a plurality of hydraulic actuators (5L,5R,6,8,9,11,13,15) and uses both pilot-controlled means which operate in response to pilot pressurized hydraulic fluid fed to the control valves (17,18,19,21,22,23R,23L,25,26), and other means (17a,18a,21a,23Ra,23La) as valve switching means,

wherein the circuit includes an unloading hydraulic fluid line upstream of at least the control valves for said other means which can release pressurized hydraulic fluid fed from the pressurized hydraulic fluid source (P1) into an hydraulic fluid reservoir (T) to lock the hydraulic actuators by shutting off pressurized hydraulic fluid fed through the control valves to the hydraulic actuators,

an unloading hydraulic fluid line selector valve (20,24) for opening or closing the unloading hydraulic fluid line, and

safety locking means for opening or closing the unloading hydraulic fluid line selector valve;

**characterized in that** said safety locking means includes a branch pilot hydraulic fluid line (S,U,N,M) connected to a pilot hydraulic fluid line (R) at a junction in said pilot hydraulic fluid line between a supply source (P2) of said pilot pressurized hydraulic fluid and pilot valves (32,33,34,35) switching to feed

pilot pressurized hydraulic fluid into said control valve (19,22,25,26) so as to switch said unloading fluid line selector valve (20,24) from an open position to a closed position by feeding the branch pilot pressurized hydraulic fluid (S,U,N,M) and

a pilot hydraulic fluid line selector valve (54) for opening or closing said pilot hydraulic fluid line being located in the pilot hydraulic fluid line (R) between said pilot pressurized hydraulic fluid source (P2) and a branch point of said pilot hydraulic fluid line (S)."

VI. State of the Art

The following documents were cited in the notice of opposition:

D1: JP-U-6-40064

D2: JP-U-2-80170

(Translations into English of both of these documents were provided).

VII. Submissions of the Parties

*Inventive Step (Article 56 EPC)*

(a) The Appellant's Case:

The Appellant submitted that the disputed patent relates to hydraulic equipment in which some actuators are operated by means of pilot valves and others by levers or the like; the purpose of the alleged invention is to provide a safety mechanism that locks

all actuators. The claimed hydraulic circuit, however, lacks an inventive step in light of D1 and D2.

According to the system of D1, operation of the pilot selector valve locks the entire system; in particular, a branch line from the pilot line operates a cylinder, which in turn provides mechanical locking of the levers that control flow of hydraulic fluid to the actuators.

Starting from D1, the Appellant sees the objective problem to be solved as providing a simpler, fail safe means of locking the entire system. The solution proposed in the disputed patent is to reduce the pressure in the hydraulic fluid feeding the actuators to zero. This solution is described in D2, in which operation of the selector/safety valve unloads the hydraulic fluid in the system, thereby locking all actuators.

The replacement of the complex cylinder arrangement of D1 by the selector valve of D2 would be a straight forward matter for the skilled person, and since a pilot branch line already exists in the system of D1, there is no inventive ingenuity in using it to activate the selector valve. The result is a hydraulic circuit having the features of claim 1.

(a) The Respondent's Case

The Respondent agreed that the invention eliminated the need for the complex locking of levers described in D1, but submitted that the combination of D1 and D2 could only be made with the benefit of hindsight. In particular, D2 does not concern a hydraulic system

involving pilot-operated valves, so firstly, there is no reason for the skilled person to consult this document, and secondly, it does not describe how the selector valve could be included in a hydraulic circuit having such a pilot arrangement. Even if the teaching of D2 were to be followed, the result would be the incorporation of a selector valve into the main hydraulic circuit so as to drain this circuit to a reservoir, as is disclosed in D2; however, there is no indication that the selector valve should itself be controlled by a pilot branch line, as required by the granted claim.

*Other Grounds of Opposition*

The remaining grounds of opposition cited in the notice of opposition (Article 100(a) (lack of novelty) and Articles 100(b) and 100(c) EPC) were not pursued in the appeal proceedings.

**Reasons for the Decision**

1. The appeal is admissible.
2. Inventive Step (Articles 100(a) and 56 EPC)
  - 2.1 The disputed patent concerns a hydraulic circuit used to operate actuators, typically in vehicles such as excavators and bulldozers that are used in the construction industry. Movement of the actuators is determined by hydraulic fluid passing through control valves; some of the control valves are manually operated by means of levers, while others are pilot-

controlled by means of hydraulic fluid operating at a significantly lower pressure than the main hydraulic fluid line.

As a matter of safety it is necessary, in a single operation, to be able to lock all of the actuators, irrespective of whether they are being controlled by levers or the pilot means, and it is this problem that the disputed patent addresses.

- 2.2 Document D1 also relates to a hydraulic system in which actuator valves are controlled by levers and pilot means, and D1 discloses a mechanism by which all actuators can be locked in a single operation. D1 therefore forms an appropriate starting point for the assessment of inventive step.

According to D1, a pilot branch line joins the pilot line to a cylinder (unlocking cylinder 68), which is connected to a means for mechanically locking the levers of the actuator valves. Operation of the pilot selector valve (61) reduces the pressure in both the pilot line and the pilot branch line, and this has two consequences. Firstly those control valves controlled by the pilot line lock their respective actuators; secondly, the reduced pressure in the pilot branch line allows the unlocking cylinder 68 to lock mechanically the levers and their respective actuators.

- 2.3 The claimed hydraulic circuit differs from that of D1 in that there is no unlocking cylinder to mechanically lock the levers, but rather, the pilot branch line operates a selector valve that unloads the main

hydraulic fluid line supplying all actuators thereby locking them.

- 2.4 As argued by the parties, starting from D1, the objective problem to be solved is how to provide a safety locking mechanism having a simpler design.
- 2.5 The Appellant submits that the solution is to be found in D2.

D2 discloses a hydraulic circuit (Figure 1) in which a pressurized hydraulic fluid operates the actuators via control valves (23,24). Selector or safety valves (37,38) are incorporated into the hydraulic fluid line between the pressurized fluid source and the control valves. When the safety valves operate, hydraulic fluid flows back into a reservoir instead of to the actuators, which are thereby locked. D2 makes no mention of a pilot means for operating the control valves and thus there is no pilot branch line for controlling the safety valve; this is done on the basis of a signal from the driver's seat. D2 simply provides the teaching that all actuators can be locked by unloading the hydraulic fluid line.

- 2.6 The Appellant submits that application of this teaching to D1 results in the claimed invention. The Board does not agree with this submission for the following reasons.
  - 2.6.1 D1 concerns a system that includes a pilot means and utilises the pilot means for locking the actuators. The system of D2 has no pilot means and locking is brought about only by unloading the main hydraulic line. In D1

the levers themselves are locked, whereas in D2 the levers are still free to move, but have no effect on the actuators. In the view of the Board this represents two different approaches to the problem of locking actuators, such that it is not immediately obvious how they could be combined.

- 2.6.2 D2 teaches the unloading of the main hydraulic line; if this were to be applied to D1, a selector/safety valve would be provided between the main hydraulic line and the reservoir; operation of the selector/safety valve would lock the actuators as disclosed in D2. But how should the selector/safety valve be activated? According to D2, this is achieved by means of a switch situated beneath the driver's seat, so taking the strict teaching of D2, this is how the unloading of the main hydraulic line would be initiated.
- 2.6.3 The Appellant argues that the skilled person would recognise that the pilot branch line of D1 can be used to operate the selector/safety valve. However, the teaching of D2 is that no pilot branch line is necessary, so the skilled person has no reason and is given no instruction to adapt the existing pilot branch line for a different purpose, namely that of operating the selector/safety valve; in addition, in the quest for simplification, the obvious measure would be to remove the pilot branch line, in accordance with D2.
- 2.6.4 It is thus not possible to arrive at the claimed hydraulic circuit in an obvious manner by applying the teaching of D2 to the circuit of D1.

2.7 Of course with the benefit of hindsight, the invention may seem trivial, but when assessed objectively the claimed subject-matter has an inventive step.

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

A. Counillon

U. Krause