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**Datasheet for the decision
of 9 August 2007**

Case Number: T 0753/05 - 3.2.05

Application Number: 98308668.7

Publication Number: 0911529

IPC: F15B 11/05

Language of the proceedings: EN

Title of invention:

Hydraulic control valve system with non-shuttle pressure compensator

Patentee:

Husco international, Inc.

Opponent:

LINDE AKTIENGESELLSCHAFT

Headword:

-

Relevant legal provisions:

EPC Art. 54, 111(1)

Keyword:

"Novelty (main request, yes)"
"Remittal (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 0753/05 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 9 August 2007

Appellant: Husco International, Inc.
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Respondent: LINDE AKTIENGESELLSCHAFT
(Opponent) Zentrale Patentabteilung
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Representative:

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 6 April 2005
revoking European Patent No. 0911529 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: W. Zellhuber
Members: P. Michel
M. J. Vogel

Summary of Facts and Submissions

- I. The appellant (patentee) lodged an appeal against the decision of the Opposition Division revoking European Patent no. 0 911 529.

The Opposition Division held that the subject-matter of claims 1 and 8 of a sole request for maintenance of the patent as granted was not new.

- II. Oral proceedings were held before the Board of Appeal on 9 August 2007.

The appellant requested that the decision under appeal be set aside and that the patent in suit be maintained on the basis of claims 1 to 12 filed during the oral proceedings, auxiliary on the basis of claims 1 to 12 of the first auxiliary request or claims 1 to 12 of the second auxiliary request, both filed on 6 July 2007.

The respondent (opponent) requested that the appeal be dismissed.

- III. The following document is referred to in the present decision:

D1: DE-C-34 13 866

- IV. Claims 1 and 7 of the main request read as follows:

"1. A hydraulic system (10) having an array of valve sections (13,14,15) for controlling flow of hydraulic fluid from a pump (18) to a plurality of actuators (20), the pump having a supply passage (31) and producing an

output pressure that is a function of pressure at a control input (32), and each valve section having a workport to which one actuator (20) connects and having a spool (42) with a metering orifice (44) that is variable to regulate flow of the hydraulic fluid from the pump (18) to the one actuator, the hydraulic system (10) comprising:

each valve section (13,14,15) having a poppet (60) and a valve element (64) slidably located in a bore (62) thereby defining a first chamber (65) on one side of the poppet, a second chamber (66) on one side of the valve element (64) and an intermediate chamber (67) between the poppet and the valve element, the poppet (60) and valve element (64) biased apart by a spring (76), the first chamber (65) connected to the metering orifice and the second chamber (66) connected to the control input (32) of the pump (18), the intermediate chamber (67) communicating with an outlet port (69) of the bore (62) through which hydraulic fluid flows to the actuator (20), and the bore (62) having an inlet port (83) that receives a pressure which is dependent upon the output pressure of the pump (18); and

wherein movement of the poppet (60) within the bore (62) controls flow of hydraulic fluid between the first chamber (65) and the outlet port, and a movement of the valve element (64) within the bore (62), controls transmission of pressure through the bore (62) from the inlet port to the second chamber (66), characterized in that the inlet port is directly connected to the pump supply passage."

"7. A hydraulic valve mechanism for enabling an operator to control the flow of pressurized fluid in a path from a variable displacement hydraulic pump (18)

having a supply passage (31) to an actuator (20) which is subjected to a load force that creates a load pressure in a portion of the path, the pump (18) having a control input (32) and producing an output pressure which varies in response to pressure at the control input (32); the hydraulic valve mechanism comprising:

 a first valve element (40) and a second valve element (42) juxtaposed to provide between them a metering orifice in the path, at least one of the valve elements (42) being movable under control on an operator to vary a size of the metering orifice and thereby control flow of fluid to the actuator (20); and

 a pressure compensator (48) for maintaining a substantially constant pressure drop across the metering orifice, the pressure compensator having a poppet (60) and a valve element (64) slidably located in a bore (62) thereby defining first and second chambers (65, 66) at opposite ends of the bore, the poppet (60) and compensator valve member (64) being biased apart by a spring (76) in an intermediate chamber (67) between the poppet and compensator valve element, the first chamber (65) being in communication with the metering orifice and the second chamber (66) connected to the control input (32) of the pump (18), and the bore (62) having an inlet (83) and having an outlet through which fluid flows to the actuator (20);

 wherein a first pressure differential between the first and intermediate chambers (65,67) and a force exerted by the spring (76) determines a position of the poppet (60) within the bore (62), the position of the poppet (60) defining a size of a variable orifice (46) through which hydraulic fluid is supplied from the first chamber (65) to the outlet, whereby a greater pressure in the first chamber (65) than in the

intermediate chamber (67) enlarges the size of the variable orifice (46) and a greater pressure in the intermediate chamber (67) than in the first chamber (65) reduces the size of the variable orifice (46); and

wherein a second pressure differential between the second and intermediate chamber (67) and a force exerted by the spring (76) determine a position of the compensator valve element (64) within the bore (62), the position of the compensator valve element (64) controlling transmission of pressure between the inlet and the second chamber (66), whereby a greater pressure in the second chamber (66) than in the intermediate chamber (67) urges the compensator valve element (64) to reduce transmission of pressure between the inlet and the second chamber (66), and a greater pressure in the intermediate chamber (67) than in the first chamber (65) urges the compensator valve element (64) to increase transmission of pressure between the inlet and the second chamber (66), characterized in that the inlet is directly connected to the pump supply passage to receive the output pressure from the pump."

V. The appellant argued substantially as follows in the written and oral procedure:

In the embodiment shown in Figure 7 of document D1, the inlet port is connected to the pump supply passage via the metering orifice. In the system of the prior art shown in Figure 1 of document D1, the control valve 13 includes the metering orifice and is connected through line 17 to the inlet port provided at the compensator 19.

The arrangement of Figure 7 corresponds to that of Figure 1, the compensator, however, being arranged in a bore within the spool 297. Thus, the inlet port acts on a metered pressure supplied through the thickness of the wall of the spool and is not directly connected to the pump.

The subject-matter of claims 1 and 7 of the main request is thus new.

VI. The respondent argued substantially as follows in the written and oral procedure:

In the embodiment shown in Figure 7 of document D1, the apertures 201 serve the function of both the inlet port and the metering orifice. The inlet port 201 is directly connected to the pump supply passage through the channel 253.

The wording of claims 1 and 7 thus does not express any difference which may exist between the functioning of the embodiment of Figure 1 of the patent in suit and that of Figure 7 of document D1.

The subject-matter of claims 1 and 7 of the main request is thus not new.

Reasons for the Decision

Main Request

1. Novelty

- 1.1 It is accepted by both parties that a hydraulic system having the features specified in the preamble of claim 1 is disclosed in document D1, in particular in connection with the embodiment illustrated in Figure 7 of the drawings. The Board sees no reason to disagree with this conclusion.

It is, however, disputed, whether or not, in this system, the characterising feature of the claim, according to which the inlet port is directly connected to the pump supply passage, is present in the embodiment of Figure 7 of document D1.

Claim 1 specifies that the bore in which the poppet and valve element are slidably located has an inlet port that receives a pressure which is dependent upon the output pressure of the pump. It is this inlet port which is referred to in the characterising feature of the claim.

In the case of the embodiment illustrated in Figure 7 of document D1, this bore is provided within the spool 297. The inlet port is the opening into this bore. The function of the metering orifice is achieved by the triangular openings 201 in the wall of the spool moving into a position in which hydraulic fluid supplied from the pump to the channel 253 can pass therethrough. Thus,

the pressure at the inlet port is modified by the metering orifice.

The feature of claim 1 according to which the inlet port is directly connected to the pump supply passage is, however, construed as requiring that the pressure supplied to the inlet port is not modified by the metering orifice being interposed between the pump and the inlet port.

The subject-matter of claim 1 is thus new.

- 1.2 Claim 7 similarly specifies that the bore in which the poppet and valve element are slidably located has an inlet that receives a pressure which is dependent upon the output pressure of the pump, and that the inlet is directly connected to the pump supply passage.

The subject-matter of claim 7 is thus new for the same reasons as set out above in connection with claim 1.

2. The Opposition Division has not had the opportunity of assessing the unexamined issue of inventive step. Therefore, in order to enable the issue of inventive step to be examined by two instances, the Board exercises its discretion under Article 111(1) EPC to remit the case to the Opposition Division for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution.

The Registrar:

The Chairman:

D. Meyfarth

W. Zellhuber