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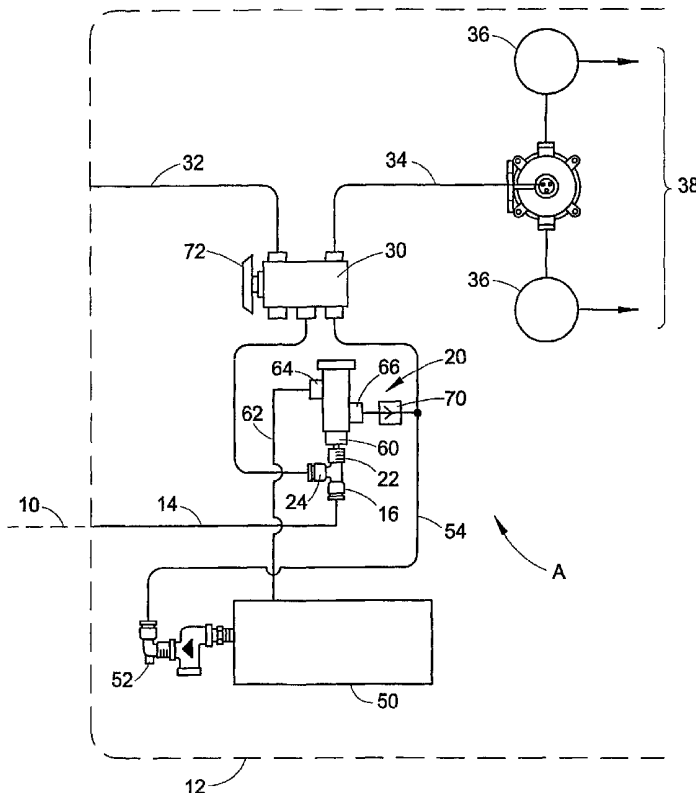
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[Continued on next page]

(54) Title: PNEUMATIC CONTROL SYSTEM FOR TRAILER CONTAINER CHASSIS LATCHING



(57) Abstract: A control system for a container chassis latching assembly of a trailer provides for initial pressurisation of the latching assembly via the trailer supply line. Once a trailer reservoir is sufficiently charged, pressure is maintained for the latch assembly by the trailer reservoir. A preferred control valve interconnects the supply line with a supply port of the valve to provide the desired pressure at a delivery port. A control port of the valve is connected with the trailer reservoir and shuts off this flow once the trailer reservoir has reached a predetermined pressure. Thereafter, the latch assembly is maintained via air supplied from the trailer reservoir.

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**PNEUMATIC CONTROL SYSTEM FOR TRAILER  
CONTAINER CHASSIS LATCHING**

**Background of the Invention**

**Field of Invention**

This application relates to a latching system, particularly one used on a trailer container chassis, and more particularly to a pneumatic control system for such a latching system.

**5 Discussion of the Art**

A trailer supply line is provided on a trailer chassis and often used to directly supply compressed air from the compressed air system associated with the tractor for various functions associated with the trailer. For example, the supply  
10 line provides air to spring brake chambers and thereby release spring brakes that would otherwise be applied in the absence of the compressed air. Another common function is in association with an air operated latching assembly. Typically, air operated latch chambers are provided with compressed air from the supply  
15 line to connect the trailer container to the trailer chassis in a secure manner.

It is also common to employ a separate reservoir system for the trailer. The trailer reservoir system, again, allows a wide array of compressed air systems associated with the trailer  
20 to be operated from a reservoir having sufficient capacity to handle multiple tasks. As will be appreciated, the size or volume of the reservoir requires time to charge the reservoir to the desired operating pressure. Thus, compressed air systems on trailers that use the reservoir must account for the possibility.  
25 that the compressed air will not be immediately available.

Known latching systems used on the trailer container chassis are either supplied by a trailer supply line or, separately, by a trailer reservoir system. Under the first scenario, the supply line feeds the latching network and a loss  
30 of the supply line results in the release of the latching mechanism, in addition to a trailer spring brake application. Under the latter system, the trailer reservoir system supplies the compressed air for the latching assembly and could result in

an operator inadvertently pulling away with the latching system disengaged. Neither of these scenarios is desirable.

Accordingly, a need exists for an improved latching system for a trailer container chassis that overcomes the various  
5 inadequacies noted above.

### Summary of the Invention

The present invention provides an improved trailer container latching system that advantageously uses compressed air  
10 from the supply line and the trailer reservoir system.

A preferred embodiment of the trailer container latching system includes a supply line adapted for connection with the trailer supply line and a separate, trailer reservoir. A trailer container latching assembly is initially in selective  
15 communication with the trailer supply line, and subsequently with the trailer reservoir via a valve, the changeover operative at a predetermined pressure being attained in the trailer reservoir.

The control valve includes a first port connected with the supply line, a second port adapted for connection with the  
20 trailer reservoir, and a third port that selectively delivers air pressure to the latching assembly. A separate line interconnects the trailer reservoir and the container latching assembly.

A method of controlling the trailer container chassis latching system includes the steps of initially connecting the  
25 supply line to the latching assembly, charging the trailer reservoir, and interconnecting the trailer reservoir with the latching assembly once a predetermined pressure level is reached.

A primary advantage of the invention resides in the ability to ensure that the latch is secured initially upon  
30 departure.

Another advantage of the invention resides in the ability to use the trailer reservoir to maintain the latch chamber once the trailer reservoir system is adequately charged.

Still another advantage of the invention resides in the  
35 ability to maintain an adequate latching should a failure occur in the trailer supply line after the trailer reservoir system is charged.

Still other advantages and benefits of the invention will become apparent to those skilled in the art upon a reading and understanding of the following detailed description.

#### Brief Description of the Drawing

The FIGURE shows a schematic representation of a pneumatic control system for trailer container chassis latching.

#### Detailed Description of the Preferred Embodiment

The FIGURE schematically represents the pneumatic control system **A** of the subject invention. Particularly, a trailer supply line **10** is shown in dotted line and represents the supply line as it leads from the tractor (not shown) of a tractor trailer system. A trailer **12** includes a supply line **14** adapted for operative connection with the supply line **10** from the tractor. Thus, when the tractor and trailer are connected together, a suitable connection (e.g., using connector fittings) is also made between the trailer supply line **10** and the supply line **14** to convey compressed air from the tractor for trailer use.

The supply line **14** is connected at its opposite end to a fitting, such as a T or divider **16**. This fitting allows flow from the supply line **14** to reach control valve **20**, as will be described further below, via a first branch **22**. A second branch **24** of the fitting provides supply line pressure to a manually actuated latching valve **30**. The latching valve communicates with spring brake chambers (not shown) associated with brakes of the trailer through line **32** and via line **34** with chambers **36** of a pneumatic latching assembly **38**. The latching assembly is, in part, pneumatically operated and is well-known in the art so that further discussion herein is deemed unnecessary.

A trailer reservoir **50** is also provided and stores compressed air for various uses on the trailer. A pressure protection valve **52** opens to deliver pressure at a specified setting or pressure level to line **54** that leads from the reservoir to the latching valve **30**. Thus, and as apparent from the FIGURE, line **54** assures that the trailer reservoir is in constant communication with the latching valve **30**, and thus is available to supply pressurized air to the latching assembly **38**.

It will be appreciated, however, that during initial charging, the reservoir 50 may not be immediately available to supply compressed air to the latching assembly. In accordance with the features of the present invention, the supply line 14 assures that compressed air is at least initially supplied from the trailer supply line 10 of the tractor. As indicated above, the supply line communicates through the branch 22 of the fitting with the control valve, particularly, a first or supply port 60 of the control valve. The trailer reservoir also communicates via line 62 with a second or control port 64 of the control valve. The pressure of the trailer reservoir is essentially monitored at the control port 64. Once the trailer reservoir reaches a predetermined minimum pressure, the control valve is switched due to sufficient pressure at the control port 64 and shuts off the flow from the supply line 14 to a third or delivery port 66 of the control valve. Thus, the supply port 60 and delivery port 66 are normally disposed in operative communication so that compressed air is available to the latching assembly 38 from the supply line 14. This assures that a latch is initially secured on departure, since the trailer supply line pressurizes the latching assembly. When the trailer reservoir is charged, control port 64 shuts off the trailer supply line and adequate pressure is provided via line 54 to maintain the latching assembly 38. This has the additional benefit that if the trailer supply line is lost at this point, it does not result in a loss of the latching mechanism since the trailer reservoir system maintains the required compressed air supply for the latching assembly. A check valve 70 is additionally interposed between the third or delivery port 66 and line 54 to allow air flow in the direction of the arrow and complete the supply path to the latch assembly during initial start up.

As briefly noted above, the supply line 14 also communicates with the spring brake chambers via line 32 extending from the latching valve. Latch pressure is also exhausted by pulling or actuating the handle 72 to an unlatch position. This control configuration has the additional advantage that if the latching valve 30 is inadvertently actuated, for example by pulling on the handle 72, an automatic parking of the trailer occurs if, in fact, it is not already parked.

Thus, the trailer container chassis is assured of compressed air from either the trailer supply line or the trailer reservoir in accordance with the preferred embodiment and the method of latching as described. Unlike known latching systems that are supplied by either the trailer supply line or the trailer reservoir system, once the trailer reservoir is sufficiently charged, it maintains the latch chamber and shuts off flow from the trailer supply line. Thus, even if the trailer supply line is subsequently lost during vehicle operation, the latching mechanism is maintained via the reservoir.

The invention has been described with reference to the preferred embodiment. Obviously, modifications and alterations will occur to others upon a reading and understanding of this specification. It is intended to include all such modifications and alterations insofar as they come within the scope of the appended claims or the equivalents thereof.

Having thus described the invention, it is claimed:

1. A trailer container chassis latching system comprising:
  - a supply line adapted for connection with a trailer supply line;
  - a trailer reservoir for storing compressed air for trailer use;
  - a latching assembly for connecting a trailer container to a trailer chassis; and
  - a valve in operative communication with the supply line, the trailer reservoir, and the latching assembly, the valve adapted to initially supply air from the trailer reservoir to the latching assembly once a predetermined pressure is attained in the trailer reservoir.
2. The trailer container chassis latching system of claim 1 wherein the valve includes a first port adapted for connection with the supply line, a second port adapted for connection with the trailer reservoir, and a third port adapted to selectively deliver air pressure to the latching assembly.
3. The trailer container chassis latching system of claim 2 further comprising a separate line interconnecting the trailer reservoir and the latching assembly.
4. The trailer container chassis latching system of claim 2 wherein the second port acts as a control port and, in response to reaching the predetermined pressure in the trailer reservoir, shuts off communication between the first and third ports.
5. The trailer container chassis latching system of claim 2 wherein the first and third port communicate with one another until the trailer reservoir reaches the predetermined pressure.
6. The trailer container chassis latching system of claim 1 further comprising an actuating member interposed between the valve and latching assembly for selectively applying and releasing the latch assembly.

7. The trailer container chassis latching system of claim 6 wherein the actuating member is operatively connected in the supply line to the spring brakes so that the spring brakes are applied upon release of the latch assembly.

8. The trailer container chassis latching system of claim 7 wherein the supply lines includes a divider to simultaneously supply the valve and actuating member.

9. A method of controlling a trailer container chassis latching system which includes a supply line, a trailer reservoir, and pneumatic latching assembly comprising the steps of:

initially connecting the supply line to the latching assembly;

charging the trailer reservoir; and

interconnecting the trailer reservoir with the latching assembly once the trailer reservoir reaches a predetermined pressure level.

10. The method of claim 9 comprising the further step of applying spring brakes associated with the trailer chassis if the latching assembly is disconnected.

11. A control system for a container chassis latching assembly of a trailer comprising:

a supply line adapted for operative connection with a trailer supply line of an associated tractor to provide compressed air to the trailer;

a trailer reservoir mounted on the trailer for storing compressed air for trailer use;

a pneumatic latch assembly for securing the trailer container to an associated trailer chassis; and

a control valve for selectively interconnecting the latch assembly to one of the supply line and the trailer reservoir whereby the latching assembly is initially connected to the supply line and subsequently connected to the trailer reservoir once a predetermined pressure is reached in the trailer reservoir.

12. The control system of claim 11 wherein the control valve includes a control port in communication with the trailer reservoir for shutting off delivery of compressed air from the supply line once the predetermined pressure is reached in the trailer reservoir.

13. The control system of claim 12 wherein the control valve includes a supply port in communication with the supply line and a delivery port in communication with the latch assembly.

14. The control system of claim 11 wherein the control valve includes a supply port in communication with the supply line and a delivery port in communication with the latch assembly.

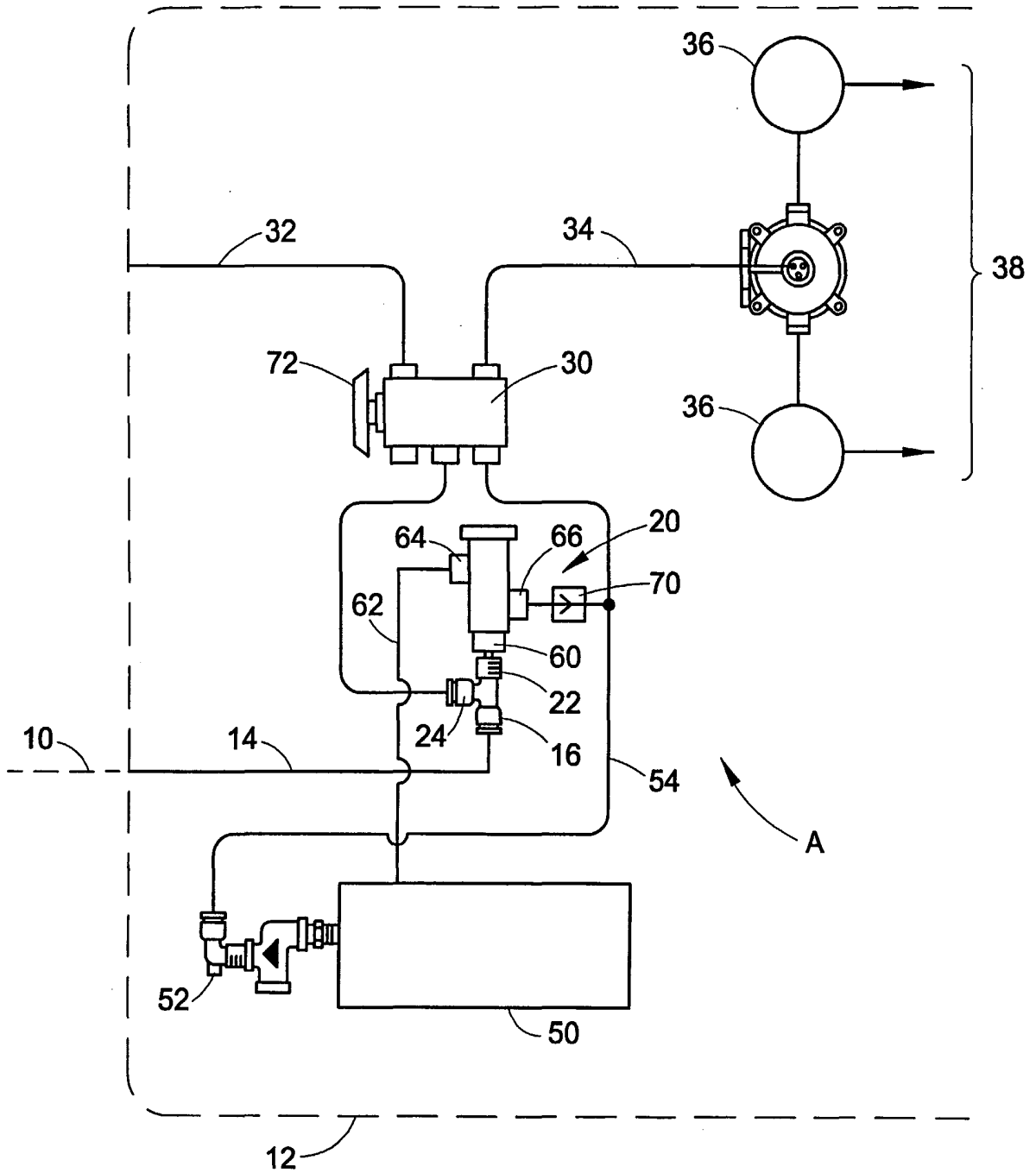
15. The control system of claim 11 wherein the supply line includes a divider upstream of the control valve whereby compressed air is simultaneously directed toward the latch assembly and spring brake chambers associated with trailer spring brakes.

16. The control system of claim 11 further comprising a latching valve interposed between the control valve and the latch assembly for selectively, manually latching and unlatching the latch assembly.

17. The control system of claim 16 wherein the latching valve interconnects spring brake chambers with exhaust when the latch assembly is in an unlatched position.

18. The control system of claim 16 wherein the control valve includes a control port connected to the trailer reservoir, a supply port connected to the supply line, and a delivery port leading to the latch assembly.

19. The control system of claim 18 wherein the trailer reservoir is interconnected with the delivery port of the control valve and the latch assembly.



**INTERNATIONAL SEARCH REPORT**

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC 7	B60T8/24 B60P7/13	B60T7/20 B60T13/66 B60T11/10 B60P1/64
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 7 B60T B60P		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
EPO-Internal, WPI Data, PAJ		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 472 001 A (FANNIN RICHARD C) 18 September 1984 (1984-09-18)  abstract column 3, line 21 -column 3, line 58; figure 1  ---	1-7, 9-14, 16-19
Y	DE 24 15 165 A (GRAUBREMSE GMBH) 16 October 1975 (1975-10-16)  page 2 -page 6; claims; figures  ---	1-7, 9-14, 16-19
A	US 5 520 446 A (WILSON LARRY ET AL) 28 May 1996 (1996-05-28) column 1, line 5 -column 5, line 19; figures  ---  -/--	1,9,11
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <span style="margin-left: 200px;"><input checked="" type="checkbox"/> Patent family members are listed in annex.</span>		
° Special categories of cited documents :		
*A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed		*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family
Date of the actual completion of the international search		Date of mailing of the international search report
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer  Berthommé, E

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
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