

(19)



(11)

EP 2 242 934 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
29.05.2013 Bulletin 2013/22

(51) Int Cl.:
F15B 21/04 ^(2006.01) **B60R 16/08** ^(2006.01)
B62D 49/06 ^(2006.01)

(21) Application number: **09703757.6**

(86) International application number:
PCT/EP2009/000119

(22) Date of filing: **12.01.2009**

(87) International publication number:
WO 2009/092521 (30.07.2009 Gazette 2009/31)

(54) **FLUID SUPPLY SYSTEMS**

FLUIDZUFUHRSYSTEME

SYSTÈMES D'ALIMENTATION EN FLUIDES

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO SE SI SK TR**

(30) Priority: **23.01.2008 GB 0801152**

(43) Date of publication of application:
27.10.2010 Bulletin 2010/43

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Description

[0001] This invention relates to a fluid supply system on a tractor such as systems used to supply pressurised air to actuate functions on the tractor.

[0002] Such air supply systems typically comprise a compressor which is connected with a storage tank in which the pressurised air is stored.

[0003] These systems suffer from operational problems if the air becomes heated and arrangements are therefore made to cool the air as it passes from the compressor to the storage tank. Such systems can be damaged if the moisture in the air becomes frozen. In earlier times this problem was dealt with by using anti-freeze fluid in the air but this is no longer done for environmental reasons. Now a drier is installed to dehumidify the air. The problem is that at air temperature above 65°C the humidity is vaporised and the drier becomes ineffective. This means that it is necessary to cool the air in order for the drier to operate correctly.

[0004] It is also known on agricultural tractors to provide a generally planar support member carried on the tractor chassis for carrying such items as fuel tanks, batteries and other components. Such planar support members not only support the components but also protect the components from blows from beneath during use of the tractor which is especially important for fuel tanks and the like. Such planar support members, hereinafter referred to as being of the kind described, may comprise a plate-like member at least partially surrounded by a tubular stiffening member which is secured to the periphery of the plate-like member.

[0005] It is an object of the present invention to provide an improved form of fluid supply system which is particularly suitable for supplying cooled air.

[0006] Thus in accordance with the present invention there is provided a fluid supply system which includes a conduit through which fluid flows in the system, the system being characterised in that at least part of the conduit is provided by the tubular stiffening member of a support member of the kind described so that the fluid is cooled as it passes through the tubular stiffening member.

[0007] The invention is preferably used to supply pressurised air and comprises an air compressor, a tank to receive the pressurised air from the compressor, a conduit connecting the compressor and tank, and a drier to remove moisture from the air as it passes from the compressor to the tank, the air being cooled as it passes through the tubular stiffening member.

[0008] The present invention can also be used to supply coolant to a vehicle engine or pressurised hydraulic fluid to a hydraulic valve or hydraulic consumer.

[0009] In a preferred arrangement for use on a tractor there are two support members of the kind described one positioned on each side of the tractor and connected in series in the conduit.

[0010] The present invention will now be described, by way of example only, with reference to the accompanying

drawings in which:-

Figure 1 shows a plan view of part of a tractor fitted with an air supply system in accordance with the present invention;

Figure 2 shows a side view of the tractor of Figure 1;

Figure 3 shows a perspective view of the air supply system of Figure 1, and

Figure 4 shows a cross-section on the line X-X of Figure 1.

[0011] Referring to the drawings a tractor chassis 10 comprises an engine block 11, transmission 12 and back axle 13. Mounted on the chassis 10 is a pair of support members 14 and 15 which are carried on cross beam 16 which is supported from beneath the chassis. Each support member comprises a flat support plate 14a, 15a which is surrounded by a tubular stiffening member 14b, 15b respectively. The stiffening members are welded or otherwise secured to the periphery of the plates 14a, 15a as can be seen from Figure 4.

[0012] The support members 14 and 15 are used to mount on the chassis such items as fuel tanks, batteries and other components and not only support these components but protect them against blows from beneath during use of the tractor. This is particularly important in relation to fuel tanks.

[0013] Also mounted on the tractor chassis is an air supply system which comprises a compressor 17 mounted on the engine block 11, an air storage tank 18 mounted on the transmission 12 and an air drier 19 mounted on the side of the transmission 12. These components are connected by a conduit 20. A first portion 20a of the conduit connects the compressor 17 with an end 14c of the tubular stiffening member 14b. Air then flows from conduit portion 20a around the stiffening member 14b and into the section 20b of the conduit. Air then flows from section 20b into the end 15c of the tubular stiffening member 15b and then exits from the stiffening member 15b via conduit 20c to enter the drier 19. From the drier 19 air passes via conduit 20d to the storage tank 18. The ends of the tubes 14b and 15b are secured to the cross beam 16 by brackets 14d and 15d respectively. The storage tank 18 is used to supply pressurised air for a variety of potential uses such as, for example, tractor or trailer air braking systems, tractor cab suspension systems and air operated implements such as seed drills.

[0014] As will be appreciated, the total length of the conduit 20 connecting the compressor 17 with the storage tank 18 is therefore of considerable length being approximately typically six meters in length. This ensures that heating of the air as it is pumped from the compressor to the storage tank is reduced by dissipation of the heat from the conduit 20 to the ambient air.

[0015] As will be appreciated the present invention

thus provides the simple but efficient method of cooling the compressed air which utilises an existing tubular stiffening member which surrounds each support member 14, 15 and through which the compressed air passes on its way from the compressor 17 to the storage tank 18. It is this recognition that the existing tubular stiffening members 14b, 15b could be used as part of the conduit to connect the compressor and storage tank which is the essence of the present invention.

[0016] The invention can also be used for other uses, for example, in systems for supplying coolant to a vehicle engine or for supplying pressurised hydraulic fluid to a hydraulic valve or hydraulic consumer. In such systems the fluid is again cooled as it passes through the stiffening members 14b, 15b.

[0017] In summary, there is provided a fluid supply system on a tractor. The system includes a conduit through which fluid flows such as compressed air or hydraulic fluid. At least part of the conduit is provided by the tubular stiffening member of a planar support member so that the fluid is cooled as it passes through the tubular stiffening member. The invention thus provides a simple but efficient method of cooling fluid by utilising, an often existing, tubular stiffening member which surrounds a planar support member.

Claims

1. A tractor fluid supply system, the system comprising a flat support plate (14a, 15a) and a conduit through which fluid flows, **characterised in that** at least part of the conduit is provided by a tubular stiffening member (14b, 15b) of the support plate (14a, 15a) so that fluid is cooled as it passes through the tubular stiffening member (14a, 15b).
2. A supply system according to Claim 1 for supplying pressurised air, the system comprising an air compressor (17), a tank (18) to receive the pressurised air from the compressor, the conduit (20) connecting the compressor (17) and tank (18), and a drier (19) to remove moisture from the air as it passes from the compressor to the tank, the air being cooled as it passes through the tubular stiffening member (14b, 15b).
3. A supply system according to Claim 1 for supplying coolant to a tractor engine, the coolant being cooled as it passes through the tubular stiffening member (14b, 15b).
4. A supply system according to Claim 1 for supplying pressurised hydraulic fluid from a pressure source to a hydraulic control valve or hydraulic consumer, the hydraulic fluid being cooled as it passes through the tubular stiffening member.

5. A supply system according to any preceding claim comprising two of said support plates (14a, 15a) which are positioned one on each side of the tractor and the tubular stiffening members (14b, 15b) are connected in series in the conduit.
6. A supply system according to any preceding claim, further comprising a fuel tank and/or a battery support on the or each support plate.
7. A supply system according to any preceding claim, wherein the tubular stiffening (14b, 15b) extends around at least part of the periphery of the support plate.

Patentansprüche

1. Fluidisches Versorgungssystem für ein Zugfahrzeug oder einen Traktor, wobei das Versorgungssystem eine flache oder ebene Tragplatte (14a, 15a) und eine Leitung, durch welche Fluid strömt, aufweist, **dadurch gekennzeichnet, dass** zumindest ein Teil der Leitung durch ein rohrartiges versteifendes Element (14b, 15b) der Tragplatte (14a, 15a) bereitgestellt ist, so dass das Fluid mit Durchtritt durch das rohrförmige versteifende Element (14b, 15b) gekühlt wird.
2. Versorgungssystem nach Anspruch 1 zum Bereitstellen von Druckluft, wobei das Versorgungssystem einen Druckluft-Kompressor (17) und einen Tank oder Behälter (18) zum Aufnehmen von Druckluft von dem Kompressor aufweist, wobei die Leitung (20) den Kompressor (17) und den Tank (18) verbindet und das Versorgungssystem einen Lufttrockner (19) zur Entfernung von Feuchtigkeit aus der Luft mit der Strömung von dem Kompressor zu dem Tank aufweist, wobei die Luft mit Durchtritt durch das rohrförmige versteifende Element (14b, 15b) gekühlt wird.
3. Versorgungssystem nach Anspruch 1 für eine Bereitstellung eines Kühlmittels für einen Motor des Traktors oder des Zugfahrzeugs, wobei das Kühlmittel mit dem Durchtritt durch das rohrförmige versteifende Element (14b, 15b) gekühlt wird.
4. Versorgungssystem nach Anspruch 1 zum Bereitstellen von druckbeaufschlagtem hydraulischem Fluid von einer Druckquelle zu einem hydraulischen Steuer- oder Regelventil oder einem hydraulischen Verbraucher, wobei das hydraulische Fluid mit dem Durchtritt durch das rohrförmige versteifende Element gekühlt wird.
5. Versorgungssystem nach einem der vorhergehenden Ansprüche mit zwei der Tragplatten (14a, 15a),

die jeweils auf einer Seite des Traktors oder Zugfahrzeugs angeordnet sind, wobei die rohrförmigen versteifenden Elemente (14b, 15b) in der Leitung in Reihe miteinander verbunden sind.

6. Versorgungssystem nach einem der vorhergehenden Ansprüche mit einem Kraftstofftank, einer Kraftstofftank-Abstützung und/oder einer Batterie-Abstützung auf der oder jeder Tragplatte.

7. Versorgungssystem nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das rohrförmige versteifende Element (14b, 15b) sich um zumindest einen Teil des Umfangs der Tragplatte erstreckt.

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6. Dispositif d'alimentation selon l'une quelconque des revendications précédentes, comprenant, en outre, un réservoir de carburant et/ou un support de batterie sur la ou chaque plaque de support.

7. Dispositif d'alimentation selon l'une quelconque des revendications précédentes, dans lequel l'élément de renforcement tubulaire (14b, 15b) s'étend autour d'au moins une partie de la périphérie de la plaque de support.

Revendications

1. Dispositif d'alimentation en fluide de tracteur, le dispositif comprenant une plaque de support plate (14a, 15a) et un conduit à travers lequel un fluide s'écoule, **caractérisé en ce qu'**au moins une partie du conduit est formée par un élément de renforcement tubulaire (14b, 15b) de la plaque de support (14a, 15a) de telle sorte que le fluide est refroidi lorsqu'il passe à travers l'élément de renforcement tubulaire (14b, 15b).
2. Dispositif d'alimentation selon la revendication 1, destiné à délivrer de l'air comprimé, le dispositif comprenant un compresseur d'air (17), un réservoir (18), afin de recevoir de l'air comprimé issu du compresseur, le conduit (20) raccordant le compresseur (17) et le réservoir (18) et un dispositif de séchage (19) destiné à éliminer l'humidité de l'air lorsqu'il passe du compresseur au réservoir, l'air étant refroidi lorsqu'il passe à travers l'élément de renforcement tubulaire (14b, 15b).
3. Dispositif d'alimentation selon la revendication 1, destiné à délivrer un réfrigérant à un moteur de tracteur, le réfrigérant étant refroidi lorsqu'il passe à travers l'élément de renforcement tubulaire (14b, 15b).
4. Dispositif d'alimentation selon la revendication 1, destiné à délivrer un fluide hydraulique sous pression à partir d'une source de pression à une vanne de commande hydraulique ou un dispositif hydraulique, le fluide hydraulique étant refroidi lorsqu'il passe à travers l'élément de renforcement tubulaire.
5. Dispositif d'alimentation selon l'une quelconque des revendications précédentes, comprenant deux desdites plaques de support (14a, 15a) qui sont positionnées de chaque côté du tracteur et les éléments de renforcement tubulaire (14b, 15b) sont reliés en série dans le conduit.

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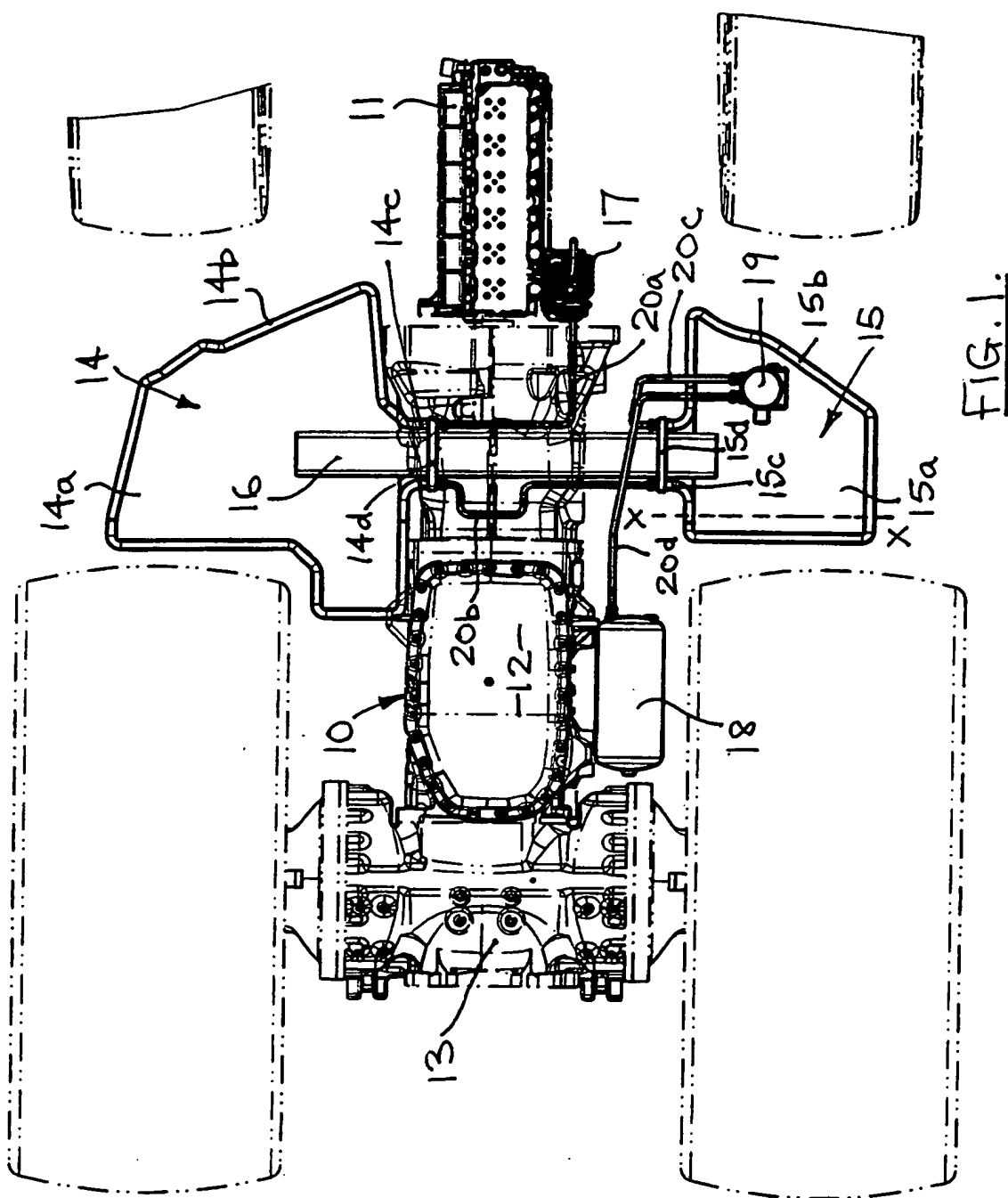
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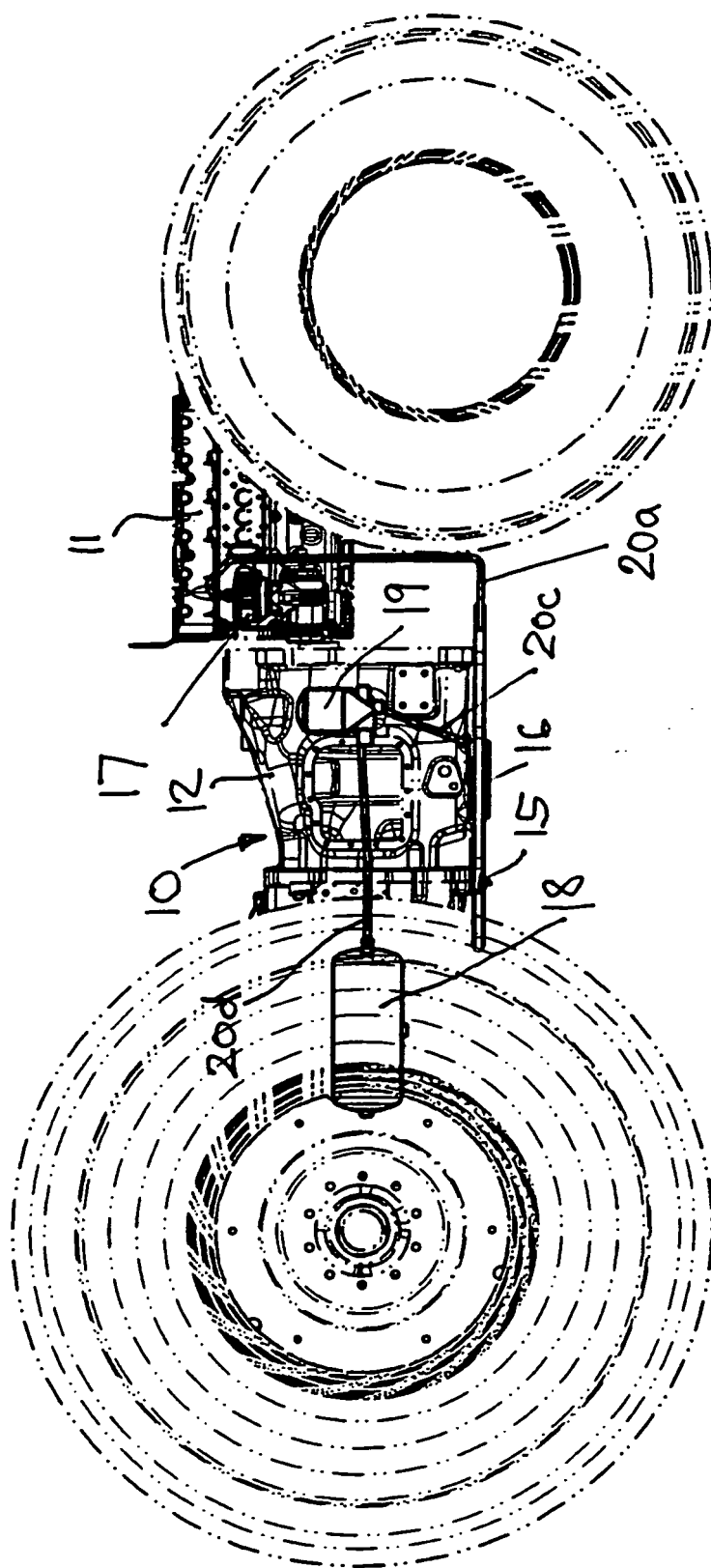


FIG. 2.

