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(54) CONSTRUCTION EQUIPMENT WITH A QUICK COUPLER CIRCUIT

BAUMASCHINE MIT EINER SCHNELLKOPPLUNGSSCHALTUNG

ÉQUIPEMENT DE CONSTRUCTION AVEC UN CIRCUIT DE COUPLEUR RAPIDE

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EP-A1- 2 138 639 JP-A- 11 181 819
JP-A- 11 324 000 JP-A- 2003 138 597
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Description

Technical Field

[0001] The present invention relates to a construction equipment comprising a working machine and a quick coupler circuit for easily attaching or detaching an attachment such as a bucket or a breaker.

Background Art

[0002] In the related art, as illustrated in FIG. 3, a hydraulic shovel (construction equipment) 1 includes a lower travelling body 2, an upper pivoting body 3 pivotably provided on the lower travelling body 2, and a working machine 4 installed on the upper pivoting body 3 which is free to be raised or lowered in a vertical direction. Furthermore, the working machine 4 includes a boom 5, a rear end of which is supported by the upper pivoting body 3 in a freely turnable manner, an arm 6, a rear end of which is supported by a leading end of the boom 5 in a freely turnable manner, and a bucket (attachment) 7 installed on the leading end side of the arm 6 in a freely turnable manner. The working machine 4 is formed in a multiple joint form. Moreover, hydraulic oil is supplied and discharged depending on the lever operation of an operator, a boom cylinder 8, an arm cylinder 9 and a bucket cylinder 10 (working actuator) are each extended and retracted, and the boom 5, the arm 6 and the bucket 7 are each turned.

[0003] Meanwhile, the construction equipment 1 has been known which is configured so that various attachments 7 such as a bucket, a breaker and a crusher can be attached to and detached from the leading end of the arm 6. Since the attachments 7 can be exchanged in this construction equipment 1, a piece of the construction equipment 1 can be used for multiple purposes and multiple functions. In addition, construction equipment 1 has been known which includes a quick coupler circuit and easily and rapidly performs attachment and detachment of attachment 7 by operation of a switch by the operator.

[0004] Generally, the quick coupler circuit (quick coupler B) is provided between the leading end of the arm 6 and the attachment 7. Moreover, the quick coupler circuit includes a quick coupler cylinder that is extended and retracted by supplying and discharging of the hydraulic oil to hold/detach the attachment 7, a hydraulic pump, an electromagnetic switching valve that switches a supplying direction of the hydraulic oil supplied from the hydraulic pump to a working actuator (the boom cylinder 8, the arm cylinder 9 and the bucket cylinder 10) side or a quick coupler cylinder side, a coupler switching valve for extending or retracting the quick coupler cylinder by switching the supplying direction of the hydraulic oil to the quick coupler cylinder, and a control device that switches and controls the electromagnetic switching valve and the coupler switching valve based on a pilot signal (operation signal) that is output by operation of the switch (for ex-

ample, see Patent Document 1).

Citation List

5 Patent Document

[0005] [Patent Document 1] Japanese Unexamined Patent Application, First Publication No. 2007-327291

10 **[0006]** [Patent Document 2] United States Patent Application, US 2004/244575 A1

[0007] Patent Document 2 discloses an attachment control system including an electrical control system and hydraulic control system. The electrical control system interfaces with the hydraulic control system to ensure that attachment decoupling in response to operator electrical control can occur only when at least two different hydraulic threshold conditions are satisfied.

Summary of Invention

Problem to be solved by the Invention

[0008] Herein, in order that the extension and retraction operation (attachment and detachment of the attachment 7) of the quick coupler cylinder is reliably performed, there is a need for a pump pressure-raising operation of an operator. For this reason, in the above-mentioned quick coupler circuit of the related art, the electromagnetic switching valve has been used. Moreover, the pilot signal for forcibly raising the pressure of the pump is controlled, and the pressure of the hydraulic pump is forcibly raised. Furthermore, in the above-mentioned quick coupler circuit of the related art, the electromagnetic switching valve and the coupler switching valve are switched and driven depending on the switch operation, and a three-position switch and a relay circuit are required so as to control two valves.

[0009] That is, in the quick coupler circuit of the related art, a switch operated by three positions and a relay circuit are combined with each other to perform the control of raising the pressure of the hydraulic pump. The three positions include a working position when extending and retracting the working actuator to perform working, a locked position when extending (or retracting) the quick coupler cylinder to hold (install) the attachment 7, and an unlocked position when retracting (or extending) the quick coupler cylinder to detach the attachment 7. Moreover, when exchanging the attachment 7, the locked position and the unlocked position are used, and the pressure of the hydraulic pump is always raised between the locked position and the unlocked position.

[0010] For this reason, only the performed control is whether or not the pressure of the hydraulic pump always rises or the pressure of the hydraulic pump does not always rise so that the quick coupler cylinder is extended or retracted, depending on the position of the switch. That is, it is impossible to control the time and the timing of the pressure raising. As a result, the movements of work-

ing actuators 8, 9 and 10 (working machine 4) are unstable while the pressure of the pump rises. Furthermore, unnecessary pump pressure raising time is generated, and thus fuel efficiency is degraded.

[0011] In view of the above, an object of the present invention is to provide a construction equipment comprising a working machine and a quick coupler circuit that is able to control the time and the timing of the pressure raising, stabilizes the operation of the working machine while the pressure of the hydraulic pump rises, and is able to improve the fuel efficiency. Solution to Problem

[0012] In order to achieve the above-mentioned object, the present invention provides a construction equipment as defined by claim 1.

Advantageous Effects of Invention

[0013] In the quick coupler circuit for construction equipment of the present invention, the quick coupler circuit transmits the operation signal of the switch to the electromagnetic switching valve via the control device. For that reason, it is possible to control the time when the electromagnetic switching valve is switched so as to raise the pressure of the hydraulic pump. That is, the control device switches and controls the electromagnetic switching valve so that the pressure of the hydraulic pump rises, based on the operation signal that is output by operating the switch to the locked position or the unlocked position. After that, at a stage when a predetermined time elapses, the control device is able to control the pump pressure raising time and timing by switching and controlling the electromagnetic switching valve so that the pressure raising of the hydraulic pump is completed.

[0014] Thereby, it is possible to perform the control so that the pressure of the hydraulic pump rises only while the quick coupler cylinder is moved, by operating the switch operated with two positions of the locked position and the unlocked position. Thus, since the pressure raising time can be minimalized compared to the quick coupler circuit of the related art, it is possible to suppress the unstable movement of each actuator (working machine) during pressure raising of the pump to the minimum. Furthermore, since an unnecessary pressure raising time of the pump is reduced, the fuel efficiency is improved.

Brief Description of Drawings

[0015]

FIG. 1 is a diagram that illustrates a quick coupler circuit for a construction equipment according to an embodiment of the present invention.

FIG. 2 is a diagram that illustrates a quick coupler circuit for a construction equipment according to modified example of an embodiment of the present invention.

FIG. 3 is a diagram that illustrates a hydraulic shovel (construction equipment).

Description of Embodiments

[0016] Hereinafter, a quick coupler circuit for construction equipment according to an embodiment of the present invention will be described referring to FIGS. 1 and 3.

[0017] Construction equipment 1 of the present embodiment is a hydraulic shovel (see FIG. 3), and includes a quick coupler circuit A for easily attaching or detaching various attachments 7 such as a bucket and a breaker to or from a leading end of an arm 6 (working machine).

[0018] Moreover, as illustrated in FIG. 1, the quick coupler circuit A of the present embodiment includes a quick coupler cylinder 11, a hydraulic pump (for example, variable capacity pump) 12, an electromagnetic switching valve (solenoid valve) 13, a coupler switching valve 14, a switch 15, and a control device 16.

[0019] The quick coupler cylinder 11 is a member for holding (installing)/detaching the attachments 7 to or from the leading end of the arm 6 by being extended and retracted by supplying and discharging of the hydraulic oil. The quick coupler cylinder 11 is built in an attaching and detaching apparatus attached to the leading end of the arm 6, and is provided between the leading end of the arm 6 and the attachment 7. Furthermore, in the quick coupler circuit A of the present embodiment, hydraulic pipes are each connected to a piston chamber 11a and a rod chamber 11b of the quick coupler cylinder 11 so that when the quick coupler cylinder 11 is extended, the attachment 7 is fixed, and when the quick coupler cylinder 11 is retracted, the attachment 7 is removed.

[0020] The electromagnetic switching valve 13 is able to change a supplying direction of the hydraulic oil supplied by the hydraulic pump 12 of a hydraulic source to a working actuator (a boom cylinder 8, an arm cylinder 9 and a bucket cylinder 10) side of the working machine 4 or the quick coupler cylinder 11 side. The electromagnetic switching valve 13 is connected to the hydraulic pump 12, each of the working actuators 8, 9 and 10, and a coupler switching valve 14 via the hydraulic pipes.

[0021] The coupler switching valve 14 is a member for extending or retracting the quick coupler cylinder 11. The coupler switching valve 14 is connected to the quick coupler cylinder 11 by the hydraulic pipes, and is able to change the supplying direction of the hydraulic oil supplied from the hydraulic pump 12 to the quick coupler cylinder 11.

[0022] The switch 15 is used when an operator changes the electromagnetic switching valve 13 and the coupler switching valve 14 at the time of exchanging (attaching or detaching) the attachment 7. The switch 15 is connected to the control device 16 using a wire harness. Furthermore, the switch 15 of the present embodiment is operated with two positions of the locked position where extending the quick coupler cylinder 11 to hold the attachment 7 and the unlocked position where retracting the quick coupler cylinder 11 to detach the attachment 7.

[0023] The control device 16 is a member for switching

and controlling the electromagnetic switching valve 13 and the coupler switching valve 14, respectively. The control device 16 is connected to the electromagnetic switching valve 13 and the coupler switching valve 14 using the wire harness. The control device 16 of the present embodiment switches and controls the coupler switching valve 14 by receiving the operation signal that is output by the operation of the switch 15 to the locked position or the unlocked position. Furthermore, the control device 16 of the present embodiment switches and controls the electromagnetic switching valve so that pressure raising of the hydraulic pump 12 begins by the operation of the switch 15, and pressure raising of the hydraulic pump 12 is stopped at a stage when a predetermined time elapses.

[0024] When exchanging (attaching or detaching) the attachment 7 with the quick coupler circuit A of the present embodiment, firstly, an operator operates the lever, and drives the working actuators 8, 9 and 10. Moreover, an operator places the attachment 7 attached to on the leading end of the arm 6 at a predetermined position.

[0025] Next, when an operator turns the switch 15 to the unlocked position, the operation signal is input to the control device 16. Moreover, the switching signals are each output to the electromagnetic switching valve 13 and the coupler switching valve 14 from the control device 16 based on the operation signal. Moreover, the electromagnetic switching valve 13 is switched by the switching signal that is output from the control device 16, and the pressure of the hydraulic pump 12 rises. Furthermore, the coupler switching valve 14 is switched by the switching signal that is output from the control device 16, and hydraulic oil is supplied and discharged so that the quick coupler cylinder 11 is retracted. The holding state of the attachment 7 installed on the leading end of the arm 6 is released by retraction of the quick coupler cylinder 11, and the attachment 7 is detached from the leading end of the arm 6.

[0026] Furthermore, in the present embodiment, after the electromagnetic switching valve 13 is switched and controlled by the control device 16 (after an operator operates the switch to the unlocked position), for example, at a stage when a predetermined time of about 10 seconds elapses, the electromagnetic switching valve 13 is switched and controlled, and the pressure raising of the hydraulic pump 12 is stopped. That is, when an operator operates the switch to the unlocked position, the quick coupler cylinder 11 is retracted, and the attachment 7 is detached from the leading end of the arm 6, the electromagnetic switching valve 13 is automatically switched and controlled by the control device 16, and the oil pressure returns to a normal pressure at the time of work.

[0027] Thereby, as in the quick coupler circuit of the related art, when an operator turns the switch 15 to the unlocked position, the pressure does not rise so as to always contract the quick coupler cylinder 11. For that reason, the pressure raising time of the hydraulic pump 12 becomes minimum. For this reason, the unstable

movement is also suppressed to the minimum when driving the respective working actuators 8, 9 and 10. Furthermore, the unnecessary pump pressure raising time is also reduced.

[0028] Next, when attaching a new attachment 7 to the leading end of the arm 6, firstly, the working machine 4 is driven so that the new attachment 7 is placed at a predetermined position of the leading end side of the arm 6 by the lever operation of the operator. At this time, since the respective working actuators 8, 9 and 10 are not unstably moved, it is possible to very suitably place the leading end side of the arm 6 at a predetermined position.

[0029] Moreover, an operator operates the switch to the locked position in a state where the leading end side of the arm 6 is placed at a predetermined position. Then, the operation signal is input to the control device 16, and the switching signals are output to the electromagnetic switching valve 13 and the coupler switching valve 14 from the control device 16 based on the operation signal, respectively. The pressure of the hydraulic pump 12 rises by the switching signals that are output from the control device 16. Furthermore, the coupler switching valve 14 is switched by the switching signals that are output from the control device 16, and the hydraulic oil is supplied and discharged so that the quick coupler cylinder 11 is extended. Moreover, a connection pin and a wedge of the new attachment 7 is caught by the extension of the quick coupler cylinder 11, and the new attachment 7 is connected to the leading end of the arm 6 and is held (installed).

[0030] Furthermore, even when the attachment 7 is installed, after the electromagnetic switching valve 13 is switched and controlled (after an operator operates the switch to the locked position) by the control device 16, for example, at a stage when a predetermined time of about 10 seconds elapse, the electromagnetic switching valve 13 is switched and controlled, and pressure raising of the hydraulic pump 12 is stopped. That is, when an operator operates the switch to the locked position, the quick coupler cylinder 11 is extended, and the attachment 7 is installed to the leading end of the arm 6, the electromagnetic switching valve 13 is automatically switched and controlled by the control device 16, and the oil pressure returns to the normal pressure at the time of work.

[0031] For that reason, when the switch 15 is turned to the locked position, the pressure of the hydraulic pump 12 does not rise so as to always extend the quick coupler cylinder 11. For that reason, pressure raising of the hydraulic pump 12 is performed in a minimum pressure raising time. Thus, even at the time of installing the attachment 7, the unstable movement of the respective working actuators 8, 9 and 10 is suppressed to the minimum when driving the respective working actuators 8, 9 and 10. Furthermore, the unnecessary pressure raising time is also reduced.

[0032] Furthermore, when installing the attachment 7, after the electromagnetic switching valve 13 is switched and controlled and the oil pressure returns to the normal

pressure at the time of work, the working actuators 8, 9 and 10 may be driven by the control device 16, for a predetermined time, for example, 5 seconds. In this case, it is possible to check whether or not the installed attachment 7 is reliably (suitably) connected and installed.

[0033] Thus, in the quick coupler circuit A for construction equipment of the present embodiment, each quick coupler circuit A transmits the operation signal output from the switch 15 to the electromagnetic switching valve 13 via the control device 16. For that reason, it is possible to control the time when the electromagnetic switching valve 13 is switched so as to raise the pressure of the hydraulic pump 12. That is, after the control device 16 switches and controls the electromagnetic switching valve 13 so as to raise the pressure of the hydraulic pump 12, based on the operation signal that is output by operating the switch 15 to the locked position or the unlocked position, by switching and controlling the electromagnetic switching valve 13 so as to finish pressure raising of the hydraulic pump 12 at a stage when a predetermined time elapses, the pump pressure raising time and timing can be controlled.

[0034] For that reason, it is possible to perform the control so that the pressure of the hydraulic pump 12 rises only while the quick coupler cylinder 11 is moved, by operating the switch 15 that is operated with two positions of the locked position and the unlocked position. Thus, compared to the quick coupler circuit of the related art, pressure raising of the hydraulic pump 12 is performed in a minimum pressure raising time in the quick coupler circuit A of the present invention. For that reason, it is possible to suppress the unstable movement of the respective working actuators 8, 9 and 10 (working machine 4) to minimum during pressure raising of the pump. Furthermore, since the unnecessary pump pressure raising time is reduced, the fuel efficiency is improved.

[0035] Although an embodiment of the quick coupler circuit for construction equipment related to the present invention has been described, the present invention is not limited to the above-mentioned embodiment but may be suitably changed within a scope that does not depart from the gist thereof. For example, in the present embodiment, although the case where the construction equipment 1 is the hydraulic shovel has been described the construction equipment related to the present invention may be other construction equipments such as a shovel loader.

[0036] Furthermore, in the quick coupler circuit A of the present embodiment, the hydraulic pipes are each connected to the piston chamber 11a and the rod chamber 11b of the quick coupler cylinder 11 so that when the quick coupler cylinder 11 is extended, the attachment 7 is fixed, and when the quick coupler cylinder 11 is retracted, the attachment 7 is detached. On the contrary to the present embodiment, as illustrated in FIG. 2, the hydraulic pipes may be each connected to the piston chamber 11a and the rod chamber 11b of the quick coupler cylinder 11 so that when the quick coupler cylinder 11 is extended,

the attachment 7 is detached, and when the quick coupler cylinder 11 is retracted, the attachment 7 is fixed.

[0037] Moreover, in the case of having the above-mentioned configuration, on the contrary to the present embodiment, when an operator operates the switch to the unlocked position, the switching signals are each output to the electromagnetic switching valve 13 and the coupler switching valve 14 from the control device 16. Moreover, the electromagnetic switching valve 13 is switched and the pressure of the hydraulic pump 12 rises. Furthermore, the coupler switching valve 14 is switched by the switching signal that is output from the control device 16, and the hydraulic oil is supplied and discharged so that the quick coupler cylinder 11 is extended. In this manner, the holding state of the attachment 7 installed to the leading end of the arm 6 is released by the extension of the quick coupler cylinder 11, and the attachment 7 is detached from the leading end of the arm 6.

[0038] Furthermore, after the electromagnetic switching valve 13 is switched and controlled (after an operator operates the switch to the unlocked position) by the control device 16, for example, at a stage when a predetermined time of about 10 seconds elapses, the electromagnetic switching valve 13 is switched and controlled, and pressure raising of the hydraulic pump 12 is stopped.

[0039] That is, when an operator operates the switch to the unlocked position, the quick coupler cylinder 11 is extended, and the attachment 7 is detached from the leading end of the arm 6, the electromagnetic switching valve 13 is automatically switched and controlled by the control device 16, and the oil pressure returns to the normal pressure at the time of work.

[0040] For that reason, pressure raising of the hydraulic pump 12 is performed in a minimum pressure raising time. As a result, when driving the respective working actuators 8, 9 and 10, the unstable movement of the respective working actuators 8, 9 and 10 is suppressed to the minimum. Furthermore, the unnecessary pump pressure raising time is reduced.

[0041] Furthermore, even when a new attachment 7 is installed to the leading end of the arm 6, on the contrary to the present embodiment, an operator operates the switch to the locked position in a state where the leading end side of the arm 6 is placed at a predetermined position. Then, the switching signals are each output to the electromagnetic switching valve 13 and the coupler switching valve 14 from the control device 16, and thus the pressure of the hydraulic pump 12 rises. Furthermore, the coupler switching valve 14 is switched by the switching signal that is output from the control device 16, and the hydraulic oil is supplied and discharged so that the quick coupler cylinder 11 is retracted. In this manner, the connection pin or the wedge of the new attachment 7 is caught by the retraction of the quick coupler cylinder 11, and the new attachment 7 is connected to the leading end of the arm 6 and is held (installed).

[0042] Furthermore, even when installing the above-mentioned attachment 7, after the electromagnetic

switching valve 13 is switched and controlled by the control device 16, for example, at a state when a predetermined time of about 10 seconds elapses, the electromagnetic switching valve 13 is switched and controlled, and pressure raising of the hydraulic pump 12 is stopped. That is, when an operator operates the switch to the locked position, the quick coupler cylinder 11 is retracted, and the attachment 7 is installed to the leading end of the arm 6, the electromagnetic switching valve 13 is automatically switched and controlled by the control device 16, and the oil pressure returns to the normal pressure at the time of work.

[0043] For that reason, when the switch 15 is turned to the locked position, the pressure of the hydraulic pump 12 does not rise so as to always contract the quick coupler cylinder 11. As a result, the hydraulic pump 12 is performed in a minimum pressure raising time. Thus, even at the time of installing the attachment 7, when driving the respective working actuators 8, 9 and 10, the unstable movement of the respective working actuators 8, 9 and 10 is suppressed to the minimum. Furthermore, the unnecessary pump pressure raising time is reduced.

Industrial Applicability

[0044] According to the present invention, there is provided a quick coupler circuit that is able to control the time when the electromagnetic switching valve is switched so as to raise the pressure of the hydraulic pump.

[0045] Furthermore, according to the present invention, in the quick coupler circuit for construction equipment, the pressure raising time of the hydraulic pump can be reduced to the minimum level. For that reason, it is possible to suppress the unstable movement of each actuator to the minimum during pressure raising of the pump. Furthermore, since the unnecessary pump pressure raising time is reduced, the fuel efficiency is improved.

Reference Signs List

[0046]

- 1 hydraulic shovel (construction equipment)
- 2 lower travelling body
- 3 upper pivoting body
- 4 working machine
- 5 boom
- 6 arm
- 7 bucket (attachment)
- 8 boom cylinder (working actuator)
- 9 arm cylinder (working actuator)
- 10 bucket cylinder (working actuator)
- 11 quick coupler cylinder
- 11a piston chamber
- 11b rod chamber
- 12 hydraulic pump

- 13 electromagnetic switching valve
- 14 coupler switching valve
- 15 switch
- 16 control device
- A quick coupler circuit for construction equipment
- B quick coupler

Claims

1. A construction equipment (A) comprising:

- a working machine (4);
- a quick coupler circuit (A) for attaching or detaching an attachment (7) to or from the working machine (4);
- wherein the quick coupler circuit (A) includes:

a quick coupler cylinder (11) that is subject to extension and retraction driving and holds/detaches the attachment (7) to or from the working machine (4);

a hydraulic pump (12) of a hydraulic source; an electromagnetic switching valve (13) that switches forced pressure raising of the hydraulic pump (12);

a coupler switching valve (14) for performing extension and retraction driving of the quick coupler cylinder (11) by switching a supplying direction of hydraulic oil to the quick coupler cylinder (11); and

a control device (16) that switches and controls the electromagnetic switching valve (13) and the coupler switching valve (14), respectively,

characterized in that the electromagnetic switching valve (13) is adapted to change a supplying direction of the hydraulic oil supplied by the hydraulic pump (12) to a working actuator side of the working machine (4) or to the quick coupler cylinder side under control of the control device (16),

the working actuator includes a boom cylinder (8), an arm cylinder (9) and a bucket cylinder (10),

the electromagnetic switching valve (13) is connected via hydraulic pipes to the hydraulic pump (12), the boom cylinder (8), the arm cylinder (9), the bucket cylinder (10) and the coupler switching valve (14),

a switch (15) for switching and operating the electromagnetic switching valve (13) and the coupler switching valve (14) is configured so as to be operated with two positions of a locked position where extending and retracting the quick coupler cylinder (11) to hold the attachment (7), and an unlocked position where extending and retracting the

quick coupler cylinder (11) to detach the attachment (7), and the control device (16) switches and controls the coupler switching valve (14) by receiving an operation signal that is output by operating the switch (15) to the locked position or the unlocked position, and switches and controls the electromagnetic switching valve (13) so that the pressure raising of the hydraulic pump (12) begins by operation of the switch (15) and the pressure raising of the hydraulic pump (12) is stopped at a stage when a predetermined time elapses.

Patentansprüche

1. Ein Baugerät, umfassend:

eine Arbeitsmaschine (4);
eine Schnellkupplungsschaltung (A) zum Anbringen oder Abnehmen eines Aufsatzes (7) an oder von der Arbeitsmaschine (4);
wobei die Schnellkupplungsschaltung (A) umfasst:
einen ein- und ausfahrbaren Schnellkupplungs-
zylinder (11), der den Aufsatz (7) an der Arbeits-
maschine (4) hält oder der den Aufsatz (7) von
der Arbeitsmaschine (4) löst;
eine Hydraulikpumpe (12) einer Hydraulikquel-
le;
ein elektromagnetisches Schaltventil (13), wel-
ches einen erzwungenen Druckanstieg der Hy-
draulikpumpe (12) umschaltet;
ein Kupplungsschaltventil (14) zum Ausfahren
und Einfahren des Schnellkupplungszyinders
(11) durch Umschalten einer Zufuhrrihtung von
Hydrauliköl zum Schnellkupplungszyylinder (11);
und
eine Steuervorrichtung (16), welche das elek-
tromagnetische Schaltventil (13) bzw. das
Kupplungsschaltventil (14) schaltet und steuert
dadurch gekennzeichnet, dass das elektro-
magnetische Schaltventil (13) dazu ausgelegt
ist, unter Kontrolle der Steuervorrichtung (16),
eine Förderrichtung des von der Hydraulikpum-
pe (12) zugeführten Hydrauliköls zu einer Ar-
beitsaktorseite der Arbeitsmaschine (4) oder
zur Schnellkupplungszyylinderseite zu ändern,
wobei der Arbeitsaktor einen Auslegerzylin-
der (8), einen Armzyylinder (9) und einen Schau-
felzyylinder (10) umfasst,
wobei das elektromagnetische Schaltventil (13)
über Hydraulikleitungen mit der Hydraulikpum-
pe (12), dem Auslegerzyylinder (8), dem Armzy-
ylinder (9), dem Schaufelzyylinder (10) und dem
Kupplungsschaltventil (14) verbunden ist,
wobei eine Schalter (15) zum Schalten und Be-

tätigen des elektromagnetischen Schaltventils
(13) und des Kupplungsschaltventils (14) so
konfiguriert ist, dass er mit zwei Positionen be-
tätigt wird; einer verriegelten Position, in die der
Schnellkupplungszyylinder (11) ausgefahren
und eingefahren wird, um den Aufsatz (7) zu hal-
ten und einer entriegelten Position, in die der
Schnellkupplungszyylinder (11) ausgefahren
und eingefahren wird, um den Aufsatz (7) zu lö-
sen, und
wobei die Steuervorrichtung (16) das Kupp-
lungsschaltventil (14) durch Empfangen eines
Betriebssignals schaltet und steuert, das aus-
gegeben wird, indem der Schalter (15) in die ver-
riegelte Position oder in die entriegelte Position
gebracht wird, und die Steuervorrichtung (16)
das elektromagnetische Schaltventil (13) schal-
tet und steuert, so dass der Druckanstieg der
Hydraulikpumpe (12) durch Betätigen des
Schalters (15) beginnt und der Druckanstieg der
Hydraulikpumpe (12) in einem Stadium ge-
stoppt wird, wenn eine vorbestimmte Zeit ver-
strichen ist.

Revendications

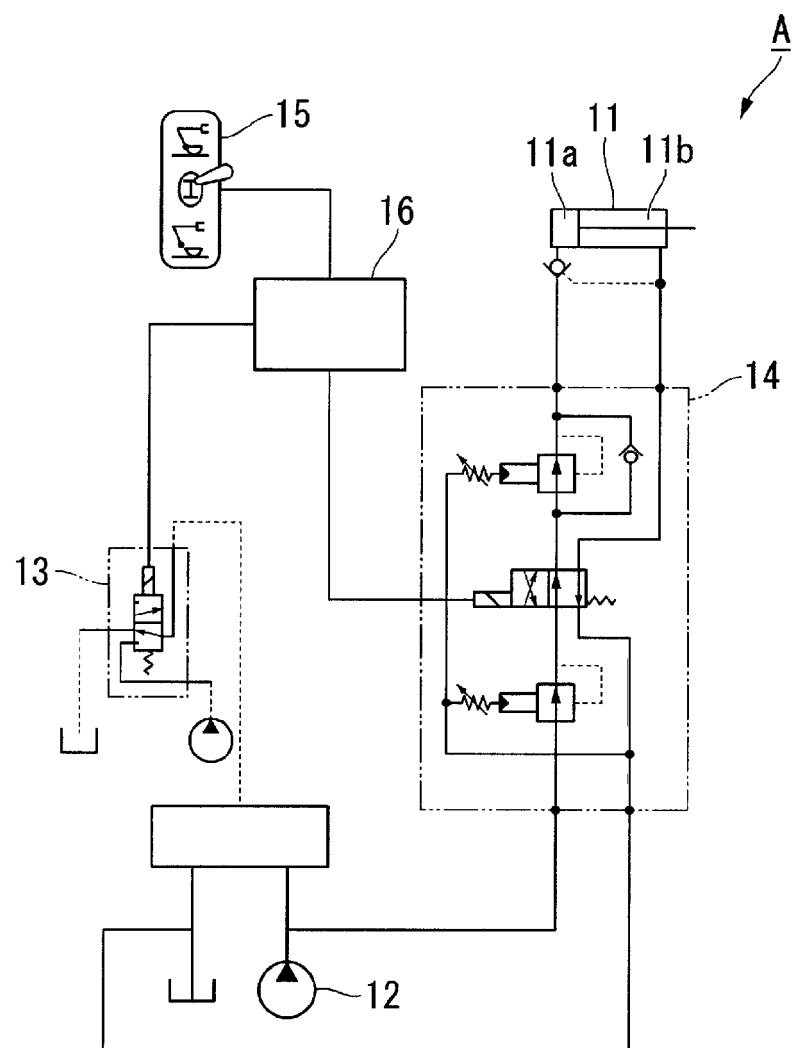
1. Un équipement de construction comprenant:

une machine de travail (4);
un circuit d'attache rapide (A) pour attacher ou
détacher un accessoire (7) sur ou de la machine
de travail (4);
où le circuit de coupleur rapide (A) comprend:

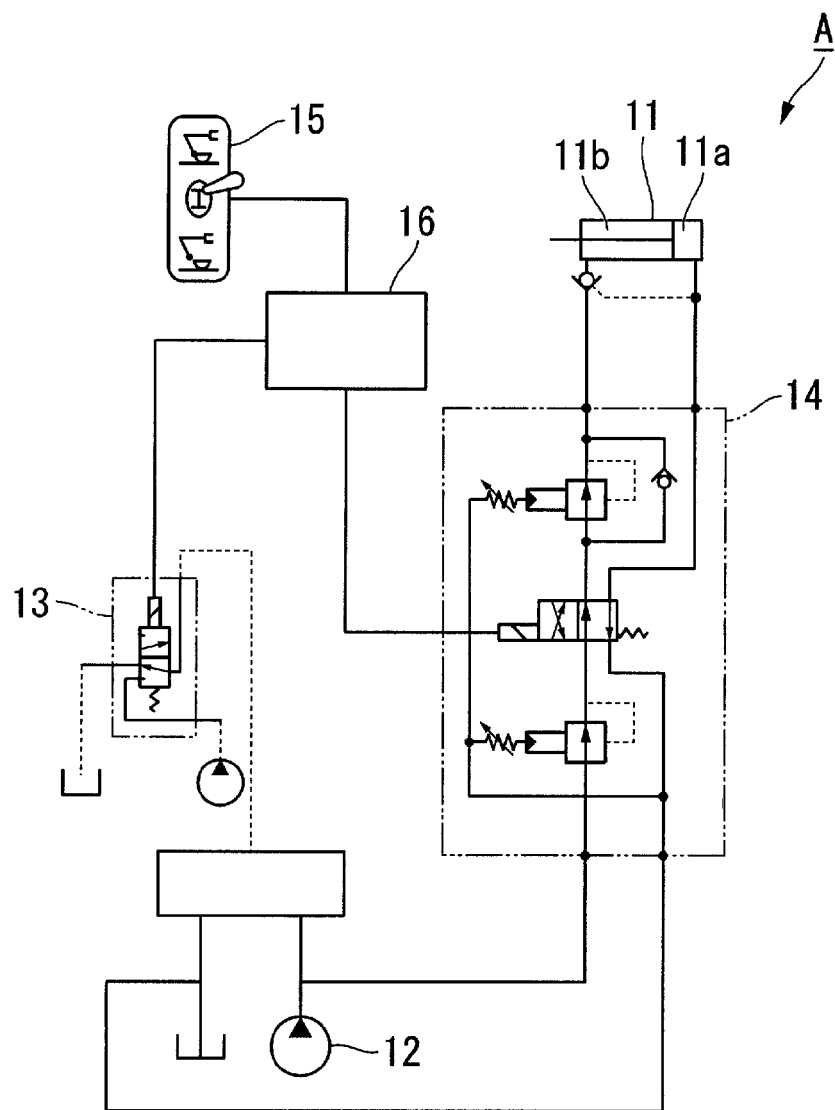
un vérin d'attache rapide (11) qui est soumis
à un entraînement d'extension et de rétrac-
tion et maintient/détache l'accessoire (7)
vers ou de la machine de travail (4);
une pompe hydraulique (12) d'une source
hydraulique;
une soupape de commutation électromag-
nétique (13) qui commute l'augmentation
de pression forcée de la pompe hydraulique
(12);
une soupape de commutation de coupleur
(14) pour effectuer un entraînement d'ex-
tension et de rétraction du vérin de coupleur
rapide (11) en commutant une direction
d'alimentation en huile hydraulique vers le
vérin de coupleur rapide (11); et
un dispositif de commande (16) qui commu-
te et commande respectivement la soupape
de commutation électromagnétique (13) et
la soupape de commutation de coupleur
(14),
caractérisé en ce que la soupape de com-
mutation électromagnétique (13) est adap-

tée pour changer une direction d'alimenta-
tion de l'huile hydraulique fournie par la
pompe hydraulique (12) vers un côté action-
neur de travail de la machine de travail (4)
ou vers le côté vérin d'attache rapide sous 5
contrôle du dispositif de commande (16),
l'actionneur de travail comprend un vérin de
flèche (8), un vérin de bras (9) et un vérin
de godet (10),
la soupape de commutation électromagné- 10
tique (13) est reliée par des conduites hy-
drauliques à la pompe hydraulique (12), au
vérin de flèche (8), au vérin de bras (9), au
vérin de godet (10) et à la soupape de com-
mutation de coupleur (14), 15
un commutateur (15) pour commuter et ac-
tionner la soupape de commutation électro-
magnétique (13) et la soupape de commu-
tation de coupleur (14) est configuré de ma-
nière à être actionné avec deux positions 20
d'une position verrouillée où l'extension et
la rétraction du vérin d'attache rapide (11)
pour maintenir l'accessoire (7) et une posi-
tion déverrouillée où l'extension et la rétrac-
tion du cylindre d'attache rapide (11) pour 25
détacher l'accessoire (7), et
le dispositif de commande (16) commute et
commande la soupape de commutation de
coupleur (14) en recevant un signal de fonc-
tionnement qui est émis en actionnant le 30
commutateur (15) en position verrouillée ou
en position déverrouillée, et commute et
commande la soupape de commutation
électromagnétique (13) de sorte que l'élé-
vation de pression de la pompe hydraulique 35
(12) commence par l'actionnement du com-
mutateur (15) et l'élévation de pression de
la pompe hydraulique (12) est arrêtée à un
stade où un temps prédéterminé s'écoule. 40
45
50
55

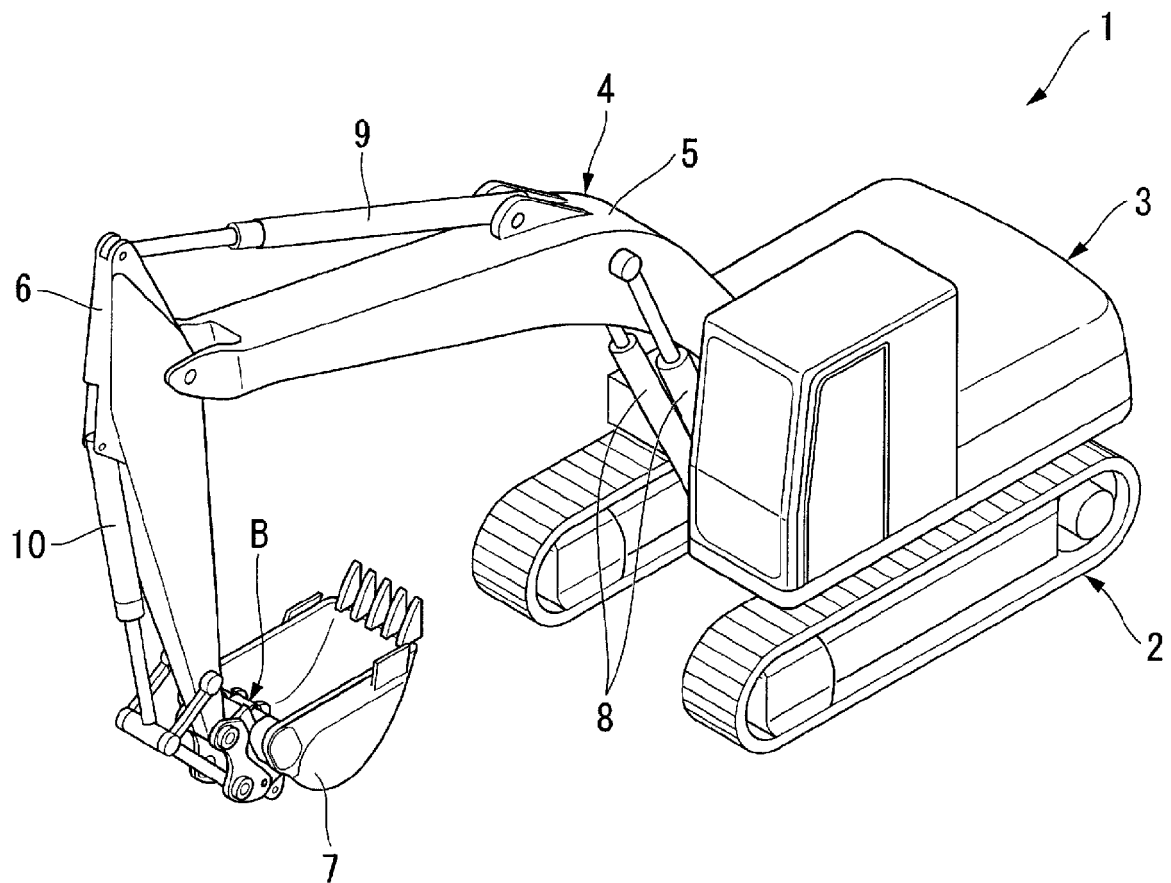
[FIG. 1]



[FIG. 2]



[FIG 3]



REFERENCES CITED IN THE DESCRIPTION

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