

APPROVED

9-7-90

AU-AI-68950/87



PCT

604399

МЕЖДУНАРОДНАЯ ЗАЯВКА, ОПУБЛИКОВАННАЯ В СООТВЕТСТВИИ С ДОГОВОРом О ПАТЕНТНОЙ КООПЕРАЦИИ (PCT)

<p>(51) Международная классификация изобретения⁴: A01B 51/00, 59/04</p>	<p>A1</p>	<p>(11) Номер международной публикации: WO 87/03775 (43) Дата международной публикации: 2 июля 1987 (02.07.87)</p>
<p>(21) Номер международной заявки: PCT/SU86/00131 (22) Дата международной подачи: 17 декабря 1986 (17.12.86) (31) Номера приоритетных заявок: 3988674/30, 3988675/30 (32) Даты приоритета: 24 декабря 1985 (24.12.85), 24 декабря 1985 (24.12.85) (33) Страна приоритета: SU (71) Заявитель (для всех указанных государств, кроме US): ТРЕСТ «ЮЖВОДОПРОВОД» [SU/SU]; Краснодар 350049, ул. Гагарина, д. 135/1 (SU) [TREST «JUZHVODOPROVOD», Krasnodar (SU)]. (72) Изобретатели, и (75) Изобретатели/Заявители (только для US): ШИШКИН Виктор Васильевич [SU/SU]; Краснодар 350049, ул. Фестивальная, д. 16, кв. 5 (SU) [SHISHKIN, Viktor Vasilievich, Krasnodar (SU)]. КРЯЖЕВ-</p>	<p>СКИХ Николай Федорович [SU/SU]; Краснодар 350049, ул. Красных партизан, д. 559, кв. 13 (SU) [KRYAZHEVSKIKH, Nikolai Fedorovich, Krasnodar (SU)]. ШАПОВАЛОВ Юрий Петрович [SU/SU]; Краснодар 350049, ул. Тургенева, д. 18. (SU) [SHAPOVALOV, Jury Petrovich, Krasnodar (SU)]. (74) Агент: ТОРГОВО-ПРОМЫШЛЕННАЯ ПАЛАТА СССР; Москва 103012, ул. Куйбышева, д. 5/2 (SU) [THE USSR CHAMBER OF COMMERCE AND INDUSTRY, Moscow (SU)]. (81) Указанные государства: AT (европейский патент), AU, DE (европейский патент), FR (европейский патент), GB (европейский патент), IT (европейский патент), JP, US Опубликована С отчетом о международной поиске A.O.J.P. 13 AUG 1987</p>	

AUSTRALIAN
15 AUG 1987
PATENT OFFICE

<p>(54) Title: AGRICULTURAL MACHINE</p>	
<p>(54) Название изобретения: СЕЛЬСКОХОЗЯЙСТВЕННАЯ МАШИНА</p>	
<p>(57) Abstract An agricultural machine comprises a chassis (1) and a device for displacing a working organ (9) along the surface of the field, which contains a hermetic chamber (3) with a window (4), a source of a fluid agent pumped into the chamber (3) under pressure and a flexible sleeve (7) which is wound on a drum (5) and which contains a traction element (8) inside it. A device which carries the working organ (9) is mounted on a section of the traction element (8) coming out at the loose end of the sleeve (7) and is movably connected to the flexible sleeve (7). The loose end of the sleeve (7) passes through the chamber (3), is turned inside out and hermetically fixed in the window (4) of the chamber (3). The annular cavity thus created (A) is connected to the chamber (3) and under the influence of the fluid agent changes its volume and displaces along the field the sleeve (7) which pushes in front of it the device carrying the working organ (9).</p>	

B — APPLICATION BY ASSIGNEE OF INVENTOR

COMMONWEALTH OF AUSTRALIA
PATENTS ACT 1952

DECLARATION IN SUPPORT OF AN APPLICATION FOR A PATENT

(Name of applicant)

In support of an application made by: TREST "JUZHVODOPROVOD"

(Title)

for a patent for an invention entitled: AGRICULTURAL MACHINE

(Full name and address of signatory)

I, Nikolai Fedorovich Kryazhevskikh
of Ulitsa Krasnykh Partizan 559, Kv. 13, Krasnodar, U.S.S.R.

do solemnly and sincerely declare as follows:

- I am authorised by the above mentioned applicant for the patent to make this declaration on its behalf.
- The name and address of each actual inventor of the invention is as follows: Viktor Vasilievich Shishkin; Nikolai Fedorovich Kryazhevskikh and Jury Petrovich Shapovalov
of Ulitsa Festivalnaya 16, Kv.5, Krasnodar, U.S.S.R.;
Ulitsa Krasnykh Partizan 559, Kv. 13, Krasnodar, U.S.S.R.
and Ulitsa Turgeneva 18, Krasnodar, U.S.S.R., respectively
and the facts upon which the applicant is entitled to make this application are as follows:
The applicant is the assignee of the said invention from the said inventors
- The basic application(s) as defined by Section 141 of the Act was (were) made as follows:
Country U.S.S.R. on 24 December 1985
in the name(s) Trest "Juzhvodoprovod"
and in U.S.S.R. on 24 December 1985
in the name(s) Trest "Juzhvodoprovod"
and in on
in the name(s)
- The basic application(s) referred to in the preceding paragraph was(were) the first application(s) made in a Convention country in respect of the invention the subject of this application.

(Full name and address of inventor)

(State whether by assignment or contract of employment)

(Delete paragraphs 3 and 4 for non-Convention application)

(Place and date of signing)

Declared at Krasnodar this 30th day of March 1987

Signed: Nikolai Fedorovich Kryazhevskikh

Position: Nikolai Fedorovich Kryazhevskikh
Manager of Trust

TREST "JUZHVODOPROVOD"

(12) PATENT ABRIDGMENT (11) Document No. AU-B-68950/87
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 601399

(54) Title
AGRICULTURAL MACHINE

International Patent Classification(s)
(51)^a A01B 059/04 A01B 035/32 A01B 051/00

(21) Application No. : 68950/87 (22) Application Date : 17.12.86

(87) WIPO Number : WO87/03775

(30) Priority Data

(31) Number	(32) Date	(33) Country
3988674	24.12.85	SU UNION OF SOVIET SOCIALIST REPUBLICS
3988675	24.12.85	SU UNION OF SOVIET SOCIALIST REPUBLICS

(43) Publication Date : 15.07.87

(44) Publication Date of Accepted Application : 13.09.90

(71) Applicant(s)
TREST JUZH VODOPROVOD

(72) Inventor(s)
VIKTOR VASILIEVICH SHISHKIN; NIKOLAI FEDOROVICH KRYAZHEVSKIKH; JURY
PETROVICH SHAPOVALOV

(74) Attorney or Agent
GRIFFITH HACK & CO, SYDNEY

(56) Prior Art Documents
AU 599355 68952/87 A01G 31/02
AU 598233 68947/87 A01B 49/06, A01C 7/00, 7/04, 7/08, 7/20

(57) Claim

1. An agricultural machine comprising a self-propelled chassis, an attachment carrying a working member with a rod for performing agricultural operations in the field and means for controlling the working member characterised in that the machine is provided with an arrangement for displacement of the working member over the field surface, comprising a hermetic chamber, a source of a fluid agent in communication with the chamber enabling the fluid agent to be pumped in the chamber under pressure, a flexible hose having an end which is mounted on a drum and a free end which is turned inside out and hermetically secured to the periphery of a port located in the hermetic chamber such that an annular space is formed in the hose which is in communication with the chamber through the port, and a tractive element secured to and projecting from the hose, the tractive element being connected to the hose such that movement of the flexible hose imparts a corresponding

(11) AU-B-68950/87
(10) 601399

-2-

movement to the tractive element, the apparatus being further arranged such that the pumping of the fluid agent into the chamber causes movement of the flexible hose in a predetermined direction and movement of the flexible hose in the predetermined direction causes a corresponding movement of the tractive element, thereby causing the working member to be displaced over the field surface.

РСТ

601399 AU-A1-68950/87
 ВЕЩНАЯ ОРГАНИЗАЦИЯ
 ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ
 Международное бюро



МЕЖДУНАРОДНАЯ ЗАЯВКА, ОПУБЛИКОВАННАЯ В СООТВЕТСТВИИ
 С ДОГОВОРом О ПАТЕНТНОЙ КООПЕРАЦИИ (РСТ)

(51) Международная классификация изобретения 4: A01B 51/00, 59/04	A1	(11) Номер международной публикации: WO 87/03775 (43) Дата международной публикации: 2 июля 1987 (02.07.87)
--	----	--

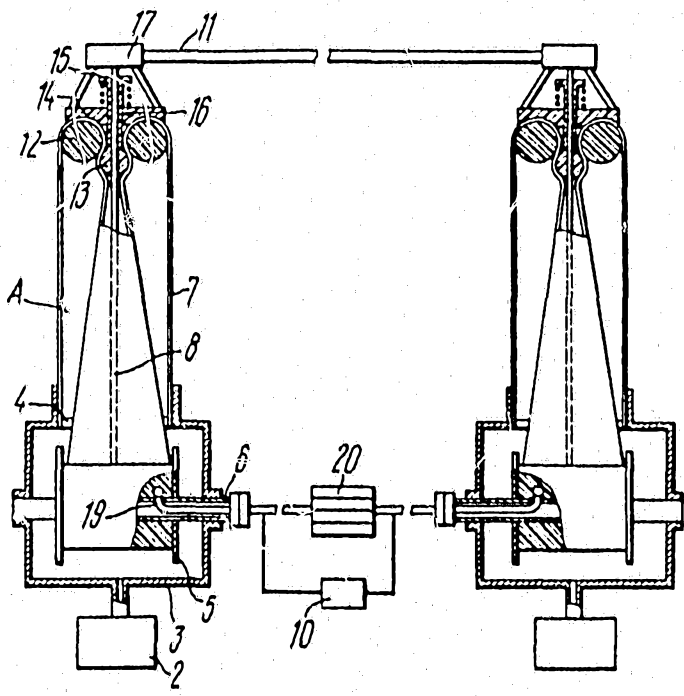
(21) Номер международной заявки: РСТ/SU86/00131
 (22) Дата международной подачи: 17 декабря 1986 (17.12.86)
 (31) Номера приоритетных заявок: 3988674/30, 3988675/30
 (32) Дат. приоритета: 24 декабря 1985 (24.12.85), 24 декабря 1985 (24.12.85)
 (33) Страна приоритета: SU
 (71) Заявитель (для всех указанных государств, кроме US): ТРЕСТ «ЮЖВОДОПРОВОД» [SU/SU]; Краснодар 350049, ул. Гагарина, д. 135/1 (SU) [TREST «JUZHVODOPROVOD», Krasnodar (SU)].
 (72) Изобретатели, и
 (75) Изобретатели/Заявители (только для US): ШИШКИН Виктор Васильевич [SU/SU]; Краснодар 350049, ул. Фестивальная, д. 16, кв. 5 (SU) [SHISHKIN, Viktor Vasilievich, Krasnodar (SU)], КРЯЖЕВ-

СКИХ Николай Федорович [SU/SU]; Краснодар 350049, ул. Красных партизан, д. 559, кв. 13 (SU) [KRYAZHEVSKIKH, Nikolai Fedorovich, Krasnodar (SU)]. ШАПОВАЛОВ Юрий Петрович [SU/SU]; Краснодар 350049, ул. Тургенева, д. 18, (SU) [SHAPOVALOV, Jury Petrovich, Krasnodar (SU)].
 (74) Агент: ТОРГОВО-ПРОМЫШЛЕННАЯ ПАЛАТА СССР; Москва 103012, ул. Куйбышева, д. 5/2 (SU) [THE USSR CHAMBER OF COMMERCE AND INDUSTRY, Moscow (SU)].
 (81) Указанные государства: AT (европейский патент), AU, DE (европейский патент), FR (европейский патент), GB (европейский патент), IT (европейский патент), JP, US
 Опубликовано
 С отчетом о международном поиске
A. O. J. P. 13 AUG 1987

AUSTRALIAN
 15 JUL 1987
 PATENT OFFICE

(54) Title: AGRICULTURAL MACHINE
 (54) Название изобретения: СЕЛЬСКОХОЗЯЙСТВЕННАЯ МАШИНА.

(57) Abstract
 An agricultural machine comprises a chassis (1) and a device for displacing a working organ (9) along the surface of the field, which contains a hermetic chamber (3) with a window (4), a source of a fluid agent pumped into the chamber (3) under pressure and a flexible sleeve (7) which is wound on a drum (5) and which contains a traction element (8) inside it. A device which carries the working organ (9) is mounted on a section of the traction element (8) coming out at the loose end of the sleeve (7) and is movably connected to the flexible sleeve (7). The loose end of the sleeve (7) passes through the chamber (3), is turned inside out and hermetically fixed in the window (4) of the chamber (3). The annular cavity thus created (A) is connected to the chamber (3) and under the influence of the fluid agent changes its volume and displaces along the field the sleeve (7) which pushes in front of it the device carrying the working organ (9).



This document contains the amendments made under Section 49 and is correct for printing.

(57) Реферат:

Сельскохозяйственная машина включает шасси (1) и устройство для перемещения рабочего органа (9) по поверхности поля, содержащее герметичную камеру (3) с окном (4), источник (2) текучего агента, закачиваемого в камеру (3) под давлением, и намотанный на барабан (5) гибкий рукав (7) с проложенным в нем тяговым элементом (8). На участке тягового элемента (8), выступающем из свободного конца рукава (7), размещено приспособление, несущее рабочий орган (9) и подвижно соединенное с гибким рукавом (7). Свободный конец рукава (7) пропущен через камеру (3), вывернут наизнанку и герметично закреплен в окне (4) камеры (3). Образующая таким образом кольцевая полость (А) сообщена с камерой (3) и под действием текучего агента изменяет свой объем и перемещает по полю рукав (7), толкающий впереди себя приспособление, несущее рабочий орган (9).

ИСКЛЮЧИТЕЛЬНО ДЛЯ ЦЕЛЕЙ ИНФОРМАЦИИ

Коды, используемые для обозначения стран-членов РСТ на титульных листах брошюр, в которых публикуются международные заявки в соответствии с РСТ:

AT Австрия	GB Великобритания	NL Нидерланды
AU Австралия	HU Венгрия	NO Норвегия
BB Барбадос	IT Италия	RO Румыния
BE Бельгия	JP Япония	SD Судан
BG Болгария	KP Коре́йская Народно-Демократическая Республика	SE Швеция
BR Бразилия	KR Коре́йская Республика	SN Сенегал
CG Центральноафриканская Республика	LI Лихтенштейн	SU Советский Союз
CH Конго	LR Ли́рия	TD Чад
CH Швейцария	LU Люксембург	TG Того
CM Камерун	MC Монако	US Соединенные Штаты Америки
DE Федеративная Республика Германии	MG Мадагаскар	
DK Дания	ML Мали	
FI Финляндия	MV Мавритания	
FR Франция	MW Малави	
GA Габон		

AGRICULTURAL MACHINE

Technical Field

5 The present invention relates to the agricultural machinery industry and more particularly to agricultural machines for various agricultural operations in the field: soil cultivation, sowing, crop cultivation and harvesting.

10 It is most advantageous to use the given type of machines on wetted and overwetted soils where the implements with an increased tractive force are needed.

Prior Art

15 At present different agricultural machines are used for cultivation of soil, sowing, crop cultivation and harvesting, comprising a self-propelled chassis, an attachment carrying a working member for performing agricultural operations in the field and means for controlling the working member.

20 A disadvantage of all the above-mentioned machines resides in an excessive compaction of soil resulting in disturbing the structure thereof which afterwards has an adverse effect on the crop yield.

25 ^{(Disclosed in}
~~known to~~ the prior art is, for example, an arrangement for placement of a fluid material in the soil, comprising a sowing apparatus, a propelling device for the sowing apparatus, a hopper for a fluid seed material and a delivery system connected by a pipeline with an air chamber (cf., for example, USSR Inventor's Certificate No. 257,899, cl. A01C 15/04, 1968). Such an arrangement is ganged up with a heavy tractor which involves a substantial compaction of soil.

30 Besides the arrangement does not possess a sufficient capacity for performing the above-mentioned agricultural operations.

35 Also ^{(disclosed in}
~~known to~~ the prior art is an arrangement for cropping, comprising a hopper for a seed material, a drive drum secured on a body, an elastic perforated element, a sowing apparatus and a harvesting mechanism



(cf. USSR Inventor's Certificate No. 803,885, Int. cl. A01 C 7/00, 1979).

5 The given arrangement is also moved over a cultivated area by a propelling device based on a tractor and also suffers from the same disadvantages. Besides this arrangement has limited engineering capabilities because of a low tractive force developed by the propelling device. The use of the given arrangement is limited by a gradient of the crop area and a degree of soil preparation.

10 Also disclosed in the prior art is an agricultural machine for sowing loose materials, comprising a self-propelled chassis, an attachment carrying the sowing apparatus and means for controlling the same (cf. USSR Inventor's Certificate No. 908,262, IPC A01 07/08, 1979).

15 The machine is ganged up with a self-propelled chassis and moved on the field sowing the required material. When the entire machine and self-propelled chassis assembly is moved on the field the soil is over-compacted under the action of the entire mass of the machine and self-propelled chassis assembly and the seed material contained therein, and the consumption of power by the moved machine is increased.

20 The machine cannot be used on wet soils, as its movement on the field becomes impossible. The operator is always in the zone of the working member operation which has an adverse effect on his fitness to work. A low tractive force does not allow the operating width to be increased for respective agricultural operations which extends the terms of the farm work completion.

25 It is an object of the present invention to ameliorate the above-mentioned disadvantages of the arrangements heretofore described or at least provide the public with a useful alternative.

35



0517s/KLH

Therefore, the present invention provides an agricultural machine comprising a self-propelled chassis, an attachment carrying a working member with a rod for performing agricultural operations in the field and means
5 for controlling the working member characterised in that the machine is provided with an arrangement for displacement of the working member over the field surface, comprising a hermetic chamber, a source of a fluid agent in communication with the chamber enabling the fluid agent to be pumped in
10 the chamber under pressure, a flexible hose having an end which is mounted on a drum and a free end which is turned inside out and hermetically secured to the periphery of a port located in the hermetic chamber such that an annular space is formed in the hose which is in communication with
15 the chamber through the port, and a tractive element secured to and projecting from the hose, the tractive element being connected to the hose such that movement of the flexible hose imparts a corresponding movement to the tractive element, the apparatus being further arranged such that the
20 pumping of the fluid agent into the chamber causes movement of the flexible hose in a predetermined direction and movement of the flexible hose in the predetermined direction causes a corresponding movement of the tractive element, thereby causing the working member to be displaced over the
25 field surface.

Such a design of the agricultural machine makes it possible to substantially reduce its mass and consequently to minimise the compaction of soil, as well as to increase the tractive force at the output to provide a good going of
30 the working member.

For widening the engineering capabilities, the drum may suitably be installed on an axle for reverse rotation.

For convenience in operation, the hermetic chamber,

35



0517s/KLH

the source of a fluid agent and the drum may advantageously be disposed on a self-propelled chassis.

To ensure rotation of the working member, the ends of the tractive element should be connected with the hose.

5 One of the embodiments provides the attachment carrying the working member in the form of a rod installed between the hose and the tractive element.

10 Such an embodiment of the attachment simplifies the construction as a whole and also makes it possible to increase the tractive force applied to the working member.

15 Another embodiment of the attachment carrying the working member comprises a toroidal part disposed in the annular space of the hose section turned inside out, a spherical body whose diameter is greater than the hole of the toroidal part, disposed directly in the hose upstream of said toroidal part, and a supporting element connected with the spherical body through the medium of a spring-loaded stem and carrying a bracket 20 for securing the rod of the working member, the tractive element being passed through a duct made in the spherical body.

25 Such an embodiment of the attachment makes it possible to use, in a machine, any working member irrespective of the tractive forces required for accomplishment of agricultural operations in the field, and also to increase the pushing force applied to the working member.

30 It is desirable that the agricultural machine be provided with one more arrangement for displacement of the working member made similarly to the first one and disposed parallel thereto, and the attachments carrying the working member should be interconnected by a coupling bar made up of the rods fastened to each 35 other.



This makes it possible to control the movement of the arrangement for displacing the working member and to increase the operating width of the working member for performance of agricultural operations.

5 Still another embodiment provides additional hoses internally accommodated in the hose and intended for delivery of constituents to the working member for performance of agricultural operations in the field, communicated with reservoirs installed on a self-propelled chassis and passed through the duct of the spherical body.

10 Such an embodiment enables the operator to control operation of the working member from the self-propelled chassis at different points of a cultivated field and also to widen the range of used constituents.

15 Thus, it may be noted that the given machine in the proposed design embodiment makes it possible to dispense with the universally accepted schemes in the accomplishment of different agricultural operations and to use the unique arrangement of a simplified design for displacement of the working member.

Summary of the Drawings

The invention will now be described in greater detail with reference to specific embodiments thereof, taken in conjunction with the accompanying drawings, wherein:

25 Fig. 1 diagrammatically illustrates a general view of the agricultural machine;

30 Fig. 2 illustrates an arrangement for displacement of a working member and an embodiment of an attachment carrying the working member;

Fig. 3 illustrates another embodiment of the attachment carrying the working member.

Preferred Embodiment of the Invention

35 An agricultural machine (Figs. 1, 2) comprises a self-propelled chassis 1 on the base of which are mounted a



source 2 of a fluid agent, for example, a gas-air mixture, a hermetic chamber 3 with a port 4 in which the gas is pumped under a pressure, a drum 5 installed on a hollow shaft 6 kinematically associated with an engine (not shown in the drawing) of the self-propelled chassis 1. A flexible hose 7 internally accommodating a tractive element 8 is wound on the drum 5. The ends of the hose 7 are connected with the tractive element 8. The drum 5 may be installed inside or outside the chamber 3, and a free end of the hose 7 should be passed through the chamber 3, turned inside out and hermetically secured in the chamber port 4. The hose 7 turned inside out forms an annular space A communicating with the chamber 3 and all the time changing its volume in the process of the hose unwinding from the drum 5. The drum 5 is installed on the shaft 6 for reverse rotation. One of the sections of the tractive element 8 projects from the free end of the hose 7 and cooperates with the attachment disposed thereon and carrying a working member 9 for performance of agricultural operations in the field. The attachment is movably connected with the hose 7. The self-propelled chassis 1 mounts means 10 for controlling the working member 9.

The hermetic chamber 3, the source 2 of a fluid agent and also the drum 5 with the flexible hose 7 wound thereon present in combination the arrangement for displacement of the attachment carrying the working member 9.

The most simple embodiment of the attachment carrying the working member 9 is illustrated in Fig. 3. It comprises a rod 11 installed between the hose 7 and the tractive element 8.

Another embodiment of the attachment carrying the working member 9 is illustrated in Fig. 2. The attachment comprises a toroidal part 12 disposed in the annular space A of the section of the hose 7 turned inside out, a spherical body 13 whose diameter is greater than



a hole of the toroidal part 12, disposed directly in the hose 7 upstream of the toroidal part 12, and a supporting element 14 disposed outside the hose 7 and connected with the spherical body 13 through the medium of a spring-loaded hollow stem 15. A duct 16 is made in the spherical body 13. A bracket 17 for securing the rod 11 of the working member 9 is mounted on the supporting element 14. The duct 16 and the hollow stem 15 are designed for passing the tractive element 8 enveloping the rods 11 (Fig. 3) and secured on the hose 7.

For increasing the operating width of the working member for accomplishment of agricultural operations in the field and for changing the direction of its movement the machine is provided with a second arrangement for displacement of the working member made similarly to the first one and disposed parallel thereto. In this case the rods 11 are fastened to each other and make up a coupling bar 18. Additional hoses 19 are internally accommodated in the hose 7 and intended for delivery of constituents to the working member 9, and communicated with reservoirs 20 installed on the self-propelled chassis 1. The additional hoses 19 are passed through the duct 16 of the spherical body 13 and the hollow stem 15.

The agricultural machine operates in the following way.

The operator drives the self-propelled chassis to the field. Depending on an agricultural operation to be accomplished, the operator secures the required working member 9 on the rod 11. Then he cuts in the source 2 of a fluid agent which enters the hermetic chambers 3 and the hoses 7 and unwinds the latter from the drum 5. Moving over the field surface the hose 7 pushes in front of itself the attachment carrying the working member 9. The direction of movement of the working member 9 on the field is changed by way of increasing or decreasing the volume of the annular space A of one of the hoses 7. When the working mem-



ber is moved over the field, different commands are fed into the actuating mechanisms of the working member 9 through the control means 10 laid inside the hoses.

When performing operations requiring a unidirectional movement of the working member, for example, soil levelling, straw raking, snow retention, it is preferred to use an attachment carrying the working member in the form of the rod 11 installed between the hose 7 and the tractive element 8. In this case the hose while unwinding from the drum 5 displaces the working member 9 at no-load to the working position and then after going into reverse the drum 5 starts winding the hose 7 thereby moving towards itself the working member 9 which does the useful work. In this case the fluid agent is forced out of the annular spaces A and is returned to the source 2 or discharged into the atmosphere. When performing operations which require the forces for displacement of the working member on both sides of the cultivated field, the use is made of an attachment carrying the working member, comprising the toroidal part 12 the spherical body 13 and the supporting element 14. The fluid agent acting on the toroidal part 12 turns the hose 7 inside out and the latter pushes the supporting element 14 which displaces the working member 9. The reverse movement of the working member is accomplished as was described hereinabove.

It should be mentioned that the tractive element 8 is capable of developing a torque in addition to the tractive force.

In this case the use is made, for example, of a known chain drive.

In the process of operation different constituents required for agricultural operations, for example, water for sprinkling, seeds for sowing, fertilizers for dressing, etc. are delivered by a known method from the reservoirs 20 through the additional hoses 19 to the wor-



king member 9.

Industrial Applicability

The present invention may be effectively used both
in the agriculture and various industries, for example,
5 for displacement of different loads, for conveying the
rock in the mining industry, for delivery of different
means over water obstacles and adverse terrain, for loa-
ding and unloading of ships when equipped wharves are
lacking.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An agricultural machine comprising a self-propelled chassis, an attachment carrying a working member with a rod
5 for performing agricultural operations in the field and means for controlling the working member characterised in that the machine is provided with an arrangement for displacement of the working member over the field surface, comprising a hermetic chamber, a source of a fluid agent in
10 communication with the chamber enabling the fluid agent to be pumped in the chamber under pressure, a flexible hose having an end which is mounted on a drum and a free end which is turned inside out and hermetically secured to the periphery of a port located in the hermetic chamber such
15 that an annular space is formed in the hose which is in communication with the chamber through the port, and a tractive element secured to and projecting from the hose, the tractive element being connected to the hose such that movement of the flexible hose imparts a corresponding
20 movement to the tractive element, the apparatus being further arranged such that the pumping of the fluid agent into the chamber causes movement of the flexible hose in a predetermined direction and movement of the flexible hose in the predetermined direction causes a corresponding movement
25 of the tractive element, thereby causing the working member to be displaced over the field surface.

2. An agricultural machine according to claim 1,
30 characterised in that the drum is installed on a shaft for reverse rotation.

3. An agricultural machine according to claim 1,
35 characterised in that the hermetic chamber, the source of a fluid agent and the drum are disposed on the self-propelled chassis.



517s/KLH

4. An agricultural machine according to claim 1, characterised in that the ends of the hose are connected with the tractive element.

5 5. An agricultural machine according to claim 1, characterised in that the attachment carrying the working member is made in the form of a rod installed between the hose and the tractive element.

10 6. An agricultural machine according to claims 1 to 4, characterised in that the attachment carrying the working member comprises a toroidal part disposed in the annular space of the hose section turned inside out, a spherical body whose diameter is greater than a hole of the toroidal part, disposed directly in the hose upstream of said
15 toroidal part, and a supporting element connected with the spherical body through the medium of a springloaded stem and carrying a bracket for securing the rod of the working member the tractive element being passed through a duct made
20 in the spherical body.

7. An agricultural machine according to claims 1, 5 and 6, characterised in that it is provided with a second arrangement for displacement of the working member made
25 similarly to the first one and disposed parallel thereto, and the attachments carrying the working member are interconnected by a coupling bar made up of the rods fastened to each other.

30 8. An agricultural machine according to claim 6, characterised in that additional hoses are internally accommodated in the hose and intended for delivery of constituents to the working member for performing agricultural operations in the field, the additional hoses
35 being communicated with reservoirs installed on the self-propelled chassis and passed through the duct of the spherical body.



9. An agricultural machine substantially as herein described with reference to the accompanying drawings.

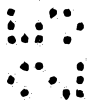
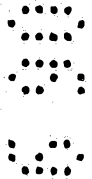
5 DATED this 12th day of June 1990

TREST "JUZHODPROVOD"

By their Patent Attorneys

GRIFFITH HACK & CO

10



517s/KLH

AGRICULTURAL MACHINE

ABSTRACT

An agricultural machine comprises a self-propelled chassis (1) and an arrangement for displacement of the working member (9) over the field surface, comprising
5 a hermetic chamber (3) with a port (4), a source (2) of a fluid agent pumped into the chamber (3) under a pressure, and a flexible hose (7) wound onto a drum (5) and internally accommodating a tractive element (8).
10 A section of the tractive element (8) projecting from a free end of the hose (7) mounts an attachment carrying the working member (9) and movably connected with the flexible hose (7). The free end of the hose (7) is passed through the chamber (3), turned inside out and hermetically secured in the port (4) of the chamber (3) so
15 that it forms an annular space (A) communicating with the chamber (3) and by changing its volume under the action of the fluid agent moves the hose (7) over the field, which pushes in front of itself the attachment carrying
20 the working member (9).



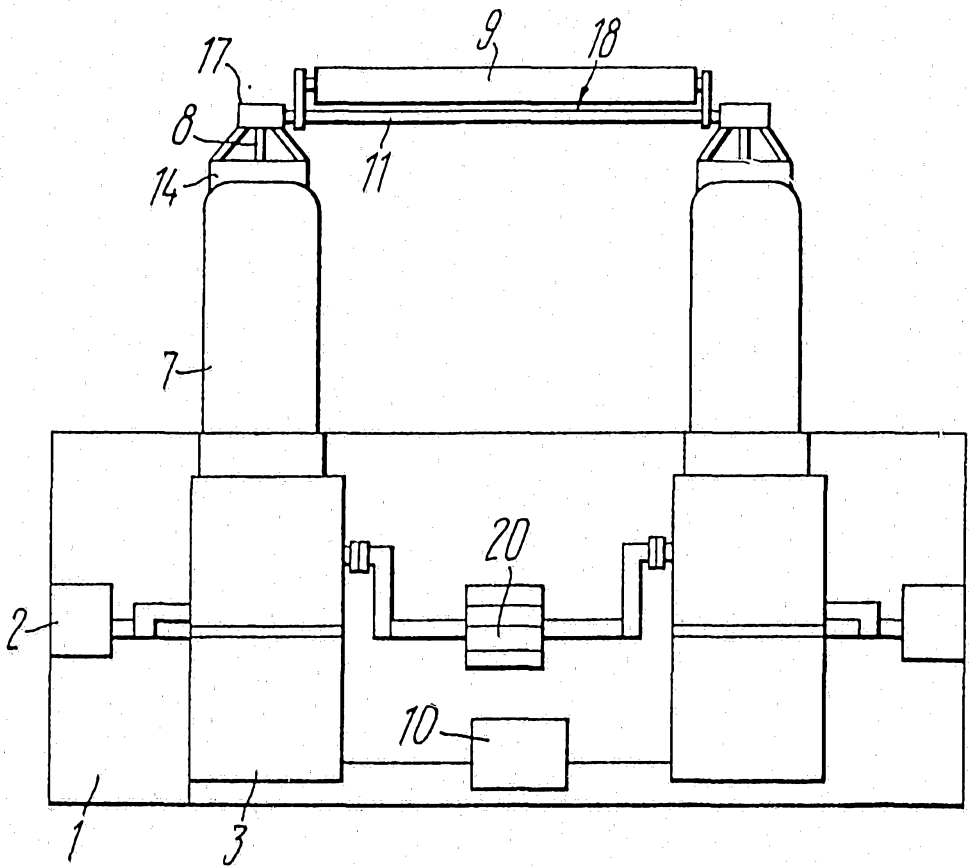


FIG. 1

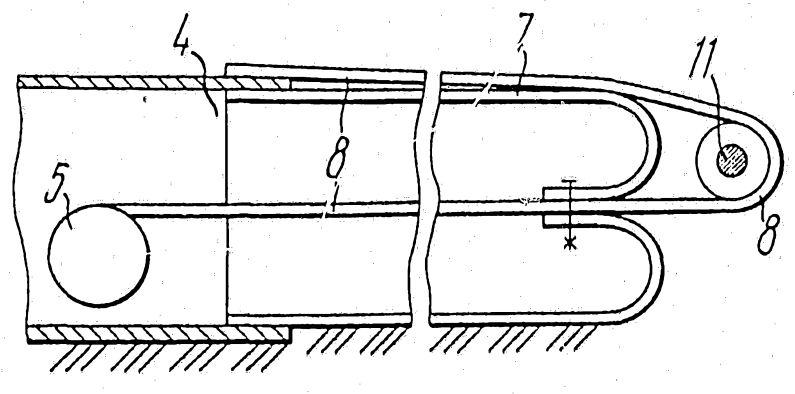


FIG. 3

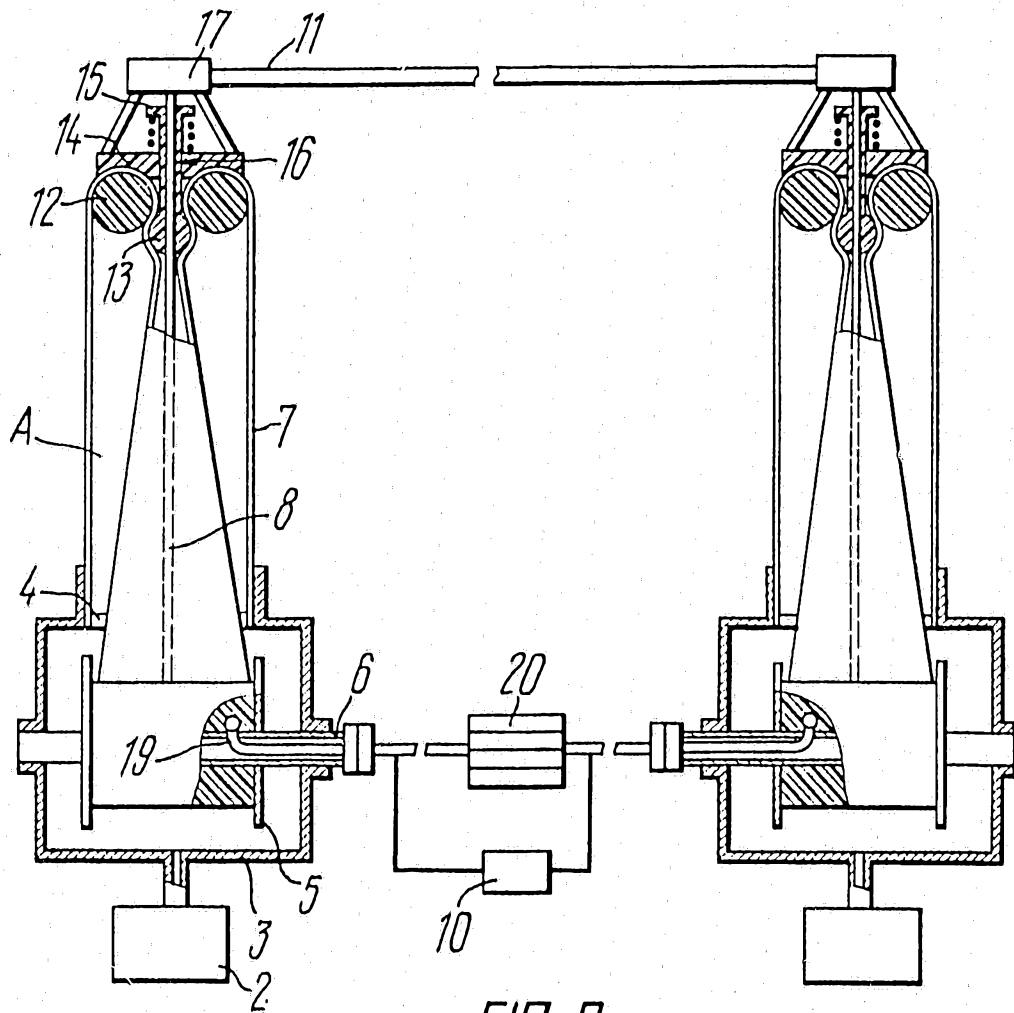


FIG. 2

INTERNATIONAL SEARCH REPORT

International Application No PCT/SU 86/00131

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC ⁴ A 01 B 51/00, 59/04		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC ⁴	A 01 B 51/00, 59/04	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched *		
III. DOCUMENTS CONSIDERED TO BE RELEVANT¹		
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	SU, A1, 266598, (Vsesojuzny nauchno-issledovatel'skiy institut mekhanizatsii sel'skogo khozyaistva et al.), 14 July 1970 (14.07.70), see the claims, figures 1-4	1
A	SU, A1, 540587 (Sredneaziatskiy ordena Trudovogo Krasnogo Znameni nauchno-issledovatel'skiy institut mekhanizatsii i elektrifikatsii sel'skogo khozyaistva) 13 January 1977 (13.01.77), see the claims, figures 1, 2	1
A	SU, A1, 753376, (Tashkentskiy ordena Trudovogo Krasnogo Znameni institut inzhenerov zheleznodorozhnogo transporta) 10 August 1980 (10.08.80), see the claims, figure 1-3	1

<p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"D" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"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</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"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.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
09 March 1987 (09.03.87)	13 April 1987 (13.04.87)	
International Searching Authority	Signature of Authorized Officer	
ISA/SU		

ОПИСАНИЕ МЕЖДУНАРОДНОГО ПОИСКА

1. КЛАССИФИКАЦИЯ ОБЪЕКТА ИЗОБРЕТЕНИЯ (если применяются несколько классификационных индексов, укажите все)

В соответствии с Международной классификацией изобретений (МКИ) или как в соответствии с национальной классификацией, так и с МКИ

МКИ⁴ - А 01 В 51/00, 59/04

II. ОБЛАСТИ ПОИСКА

Минимум документаций, охваченной поиском⁷

Классификационные рубрики

МКИ⁴

А 01 В 51/00, 59/04

Документация, охваченная поиском и не входившая в минимую документацию, в той мере, насколько она входит в область поиска⁸

III. ДОКУМЕНТЫ, ОТНОСЯЩИЕСЯ К ПРЕДМЕТУ ПОИСКА⁹

Категория - Ссылка на документ¹¹, с указанием, где необходимо, час.ч. относящихся к предмету поиска¹²
Относится к пункту формулы №13

A	RU, A1, 266598, (Всесоюзный научно-исследовательский институт механизации сельского хозяйства и другие), 14 июля 1970 (14.07.70), смотри формулу, фиг. 1-4
A	RU, A1, 540587, (Среднеазиатский орден Трудового Красного Знамени научно-исследовательский институт механизации и электрификации сельского хозяйства), 13 января 1977 (13.01.77), смотри формулу, фиг. 1, 2
A	RU, A1, 753376, (Ташкентский орден Трудового Красного Знамени институт инженеров железнодорожного транспорта), 10 августа 1980 (10.08.80), смотри формулу, фиг. 1-3

¹⁰ Особые категории специальных документов

- A. Документ, определяющий общий уровень техники, который не имеет наиболее близкого аналога, относящийся к предмету поиска.
- B. Документ, относящийся к устройству раскрытия изобретения, в котором приводится (или) на установочной дате публикации другая и/или другая документация, а также в других целях (как указано).
- C. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- D. Документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- E. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- F. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- G. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- H. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- I. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- J. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- K. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- L. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- M. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- N. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- O. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- P. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- Q. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- R. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- S. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- T. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- U. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- V. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- W. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- X. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- Y. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.
- Z. Документ, относящийся к устройству раскрытия изобретения, в котором приводится документ, опубликованный до даты публикации настоящей заявки, но после даты публикации настоящего документа.

Дата действительного завершения международного поиска
09 марта 1987 (09.03.87)

Дата отправки настоящего отчета о международном поиске
13 апреля 1987 (13.04.87)

Международный поисковый орган
ISA/SU

Подпись уполномоченного лица
Н. Шенгелер