

Sept. 23, 1969

V. J. SARVELA ET AL

3,468,442

REAR LOADER FOR TRACTOR ATTACHMENT

Filed May 31, 1967

2 Sheets-Sheet 1

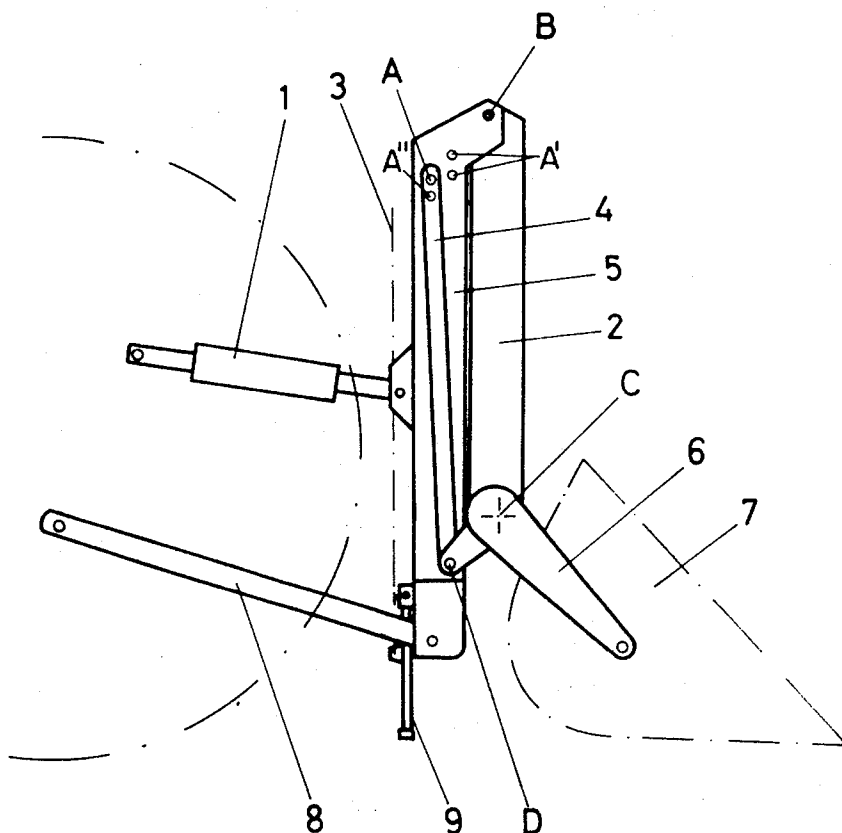


Fig.1

VILHO JUHANI SARVELA
JAAKKO HERMANNI SARVELA
ET AL.
INVENTORS
Richard A. Grier
ATTORNEYS

Sept. 23, 1969

V. J. SARVELA ET AL

3,468,442

REAR LOADER FOR TRACTOR ATTACHMENT

Filed May 31, 1967

2 Sheets-Sheet 2

Fig. 2

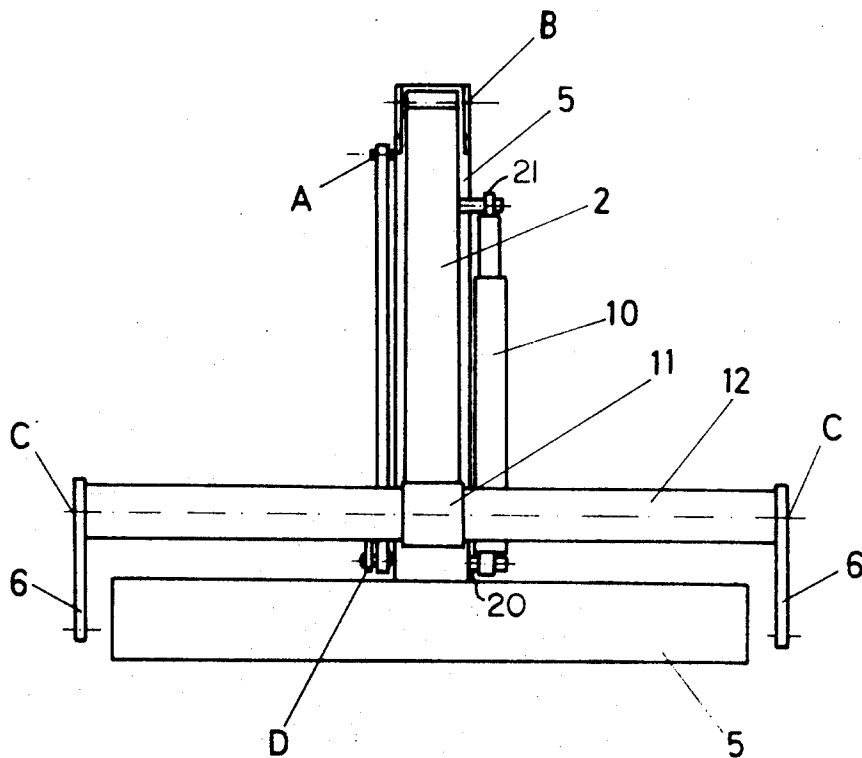
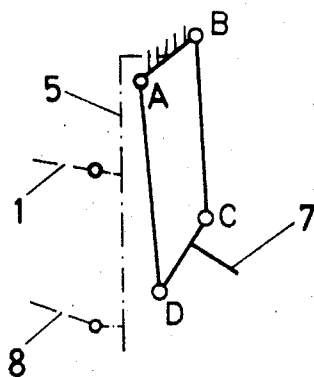


Fig. 3



VILHO JUHANI SARVELA

JAAKKO HERMANNI SARVELA ET AL.
INVENTORS

Richard & Geis

ATTORNEYS

1

2

3,468,442

REAR LOADER FOR TRACTOR ATTACHMENT

Vilho Juhani Sarvela, Otsolahdentie 15, Tapiola, and

Jaakko Hermanni Sarvela, Itikka, Iisalmi, Finland

Filed May 31, 1967, Ser. No. 642,601

Int. Cl. E02f 3/00

U.S. Cl. 214-766

3 Claims

ABSTRACT OF THE DISCLOSURE

A rear loader which is adapted to be attached to a tractor, comprises a body having the shape of an inverted T, a jib having an upper portion rotatably connected to the upper portion of the body and a lower portion rotatably supporting a transverse shaft to which the loading implement is attached. A power cylinder drive has one end attached to the lower portion of the body and another end attached to the upper portion of the jib spaced from the upper end of the jib. A linkage rod has one end pivoted to the upper portion of the body and another end pivoted to a lug carried by the transverse shaft.

The present invention refers to a rear loader, comprising a substantially vertical body for attachment to the three-point linkage of the tractor and in the upper part of which a jib structure supporting and controlling the implement or loading element according to the invention is turnably carried.

Innumerable different types of rear loader are previously known and available in the market. Such previously known loaders are mostly of rather complicated design, which increases their price; moreover they have often been designed to be suitable for one kind of work only. To these drawbacks, among others, attention has been paid in the present invention and endeavours have been made to devise a design solution of greatest possible simplicity allowing a number of different implements to be attached, which is rendered possible by the jib construction employed in the invention.

Rear loaders according to the present invention being intended to be turned out in series production, another aim kept in mind in the design is the possibility to assemble such loaders at the site of use from a few unit components, these unit components being of a kind enabling all of them to be packed together in a very small space, thus keeping the transporting and freight costs for the device at a minimal level since the shipment will be at weight tariff rates.

The invention is mainly characterized in that the loading element is attached to the upper part of the body by means of a mechanism operating according to the principle of a planar linkage having four links, two of its pivot points integrally connected to the loader body and two others to the loading element, that is the loading element being attached to the connecting rod of the linkage.

The invention is described in greater detail in the following, with reference to an embodiment of the invention, which is diagrammatically shown in the attached drawing.

FIG. 1 shows the rear loader, viewed from the side, and FIG. 2 presents the body components of the same rear loader, seen from the rear. FIG. 3 elucidates, in terms of the notations customary in the theory of linkages, the mechanism moving and controlling the implement or loading element of the rear loader.

The body unit 5 of the rear loader has the shape of inverted T, and it is a box construction. The body 5 is attached to the push rod 1 and the pull rods 8 of the

tractor. The control and supporting mechanism of the loading element 7, in this instance a scoop, includes a box-type beam 2 acting as a jib and pivoted at its upper end at point B on the body 5. At the lower end of the jib 2 a transversal bearing 11 has been placed, by which the body part of the implement 12, 6 is supported and governed so that it can turn and assume positions at different angles in relation to the jib 2. The arms 6 supporting the implement are most suitably such that their angular position in relation to the shaft 12 can be adjusted, thus facilitating the attachment of different implements to the structure.

On the shaft 12 a lug has been provided, bearing a pivot D which is connected by the rod 4 to point A on the body 5 of the loader. The movement of the jib with reference to the body 5 is accomplished by means of a hydraulic or pneumatic cylinder 10 connected at 20 to the body 5 and at 21 to the jib 2 as shown in FIG. 2.

As a result of the solution chosen, the movements of the loading implement 7 are produced and governed according to the same principle which is seen in FIG. 3. It is thus to be understood that a planar linkage consisting of four rods and having the pivots A, B, C, D is concerned. The rods AD and BC are most appropriately essentially equal in length and the connecting rod CD of the linkage shorter than the component AB of the linkage integral with the body. It is advantageous to design the linkage so that its operation is adjustable within certain limits, and this is most conveniently achieved in practice by making one of the components between two pivots of the linkage adjustable in length. In the embodiment displayed in the drawing, it has been primarily envisioned that the pivot point A is arranged on the body 5 to be adjustable as regards its position, so that the length of the body-side linkage rod AB can be adjusted. Such adjustability is particularly important when it is intended to use different implements with the rear loader, because different paths of motion are required e.g. for a scoop and for a truck fork. As shown in FIG. 1, the pivot point A may be made adjustable by providing additional holes A' in the body 5. The upper end of the rod 4 may be pivotally connected with any one of these holes. The upper end of the rod 4 is provided with an additional hole A'' which may be alternately used to vary the pivotal connection.

In the embodiment shown in the drawing, a dumpable implement of the scoop type has been suspended from the arms 6. Its locking in position may be effected e.g. by means of a pawl device mounted on the shaft 12 (not depicted), which engages with a counterpart placed on the rear face of the scoop. It is also possible to attach other kinds of implements to the rear loader according to the invention if the scoop is dismantled and the position of the arms 6 with reference to the shaft 12 is suitably adjusted. The implements which can be considered include e.g. a truck fork, hay sweep, pitch fork, bulldozer plate, and various loading platforms and devices.

In order that so-called quick couplings might be used at the ends of the push rod and pull rods, a leg 9 has been placed behind the body 5 (FIG. 1), which can be turned up or lowered down into the position shown in the drawing by means of a wire 3 or some other equivalent arrangement, which should properly be carried with the aid of suitable transmissions close enough to the driver's seat so that the driver may from his seat lower the leg 9, release the quick couplings and drive away with the tractor. When the rear loader according to the invention has been left in this position, its recoupling to the tractor is easily accomplished.

The service characteristics of the rear loader may be rendered even more versatile if the conventional push

rod of the tractor is replaced by a hydraulic or pneumatic power cylinder or some other equivalent arrangement so that the length of the push rod can be easily varied during work from the driver's seat, as need arises.

In order that it might be possible to transport the rear loader in a package of minimum dimensions and because owing to its basic shape good chances exist for this, it is favourable in practice to design also the body 5 to be assembled of two parts to form a body 5 having the shape of a T as in FIG. 2 when they are joined e.g. with bolts and nuts. When the loader is packaged for transport, the shaft 12, at least, will then also be dismantled from the bearing 11 at the end of the jib, and as a result the entire rear loader can be accommodated in a surprisingly small space.

One of the characteristics inherent in a rear loader according to the present invention, owing to its design, is that during the entire lifting process the center of gravity of the load to be lifted can be placed so close to the rear axle of the tractor that counterweights at the front end of the tractor become unnecessary; in addition to the advantages of lower cost, this reduces the stresses imposed on the tractor and, for instance, there is no need to strengthen the frame of the tractor by any bracing beams or equivalent, which often have to be fitted when previously known types of rear loaders are used.

The structural embodiment of the rear loader shown in the drawing is intended, in the first place, to give a clear idea of the invention and the invention is not restricted to the solutions shown in the drawing nor to any other particular presented in the foregoing; on the contrary the embodiments of the invention may vary within the limits defined in detail by the patent claims.

We claim:

1. A rear loader, comprising a substantially vertical body having the shape of an inverted T, tractor-attaching means connected with said body, a jib, a pivot mounted

in an upper portion of said body and swingably supporting the upper end of said jib, a transverse shaft rotatably mounted in a lower portion of said jib, implement-carrying means carried by said shaft, a power cylinder device having one end connected to a lower portion of said body and another end connected to an upper portion of said jib at a distance from the upper end of said jib, at least one linkage rod having one end pivotally connected to the upper portion of said body, and a lug carried by said shaft, the other end of said linkage rod being pivotally connected to said lug, the distance between said one end of the linkage rod and said pivot being greater than the distance between said other end of the linkage rod and the axis of said shaft.

2. A rear loader in accordance with claim 1, comprising means varying the location of the pivotal connection of said one end of the linkage rod to the upper portion of said body.

3. A rear loader in accordance with claim 1, wherein said body consists of two detachably connected box beam elements and wherein said jib and said shaft are detachably connected.

References Cited

UNITED STATES PATENTS

2,712,389	7/1955	Sewell et al.	214—766
2,833,432	5/1958	Foster	214—131
3,127,999	4/1964	Gostomski	214—766
3,368,706	2/1968	Vaalimaa et al.	214—766
3,373,885	3/1968	Allison	214—131

FOREIGN PATENTS

1,289,522 12/1962 France.

HUGO O. SCHULZ, Primary Examiner