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A boom attachment

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(56) Related Art
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ABSTRACT

A boom attachment for a road repair vehicle, the attachment having a mounting portion attachable to a front lower location of the vehicle for pivotal movement about an axis extending across the vehicle. A telescopic boom arm, which is movable between an extended position and a storage position, is pivotally mounted to the mounting portion for pivotal movement about an axis extending across the vehicle. A pivotable leading hose guide supports and guides a leading end portion of a delivery hose. A pivotable trailing hose guide supports and guides a portion of the hose spaced from the leading hose portion. The hose guides ensuring that the hose extends from the vehicle and that the hose is maintained relatively straight when the boom arm is in the extended position. The hose guides controlling the movement of the hose when the boom arm is moved from the extended to the storage position.

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**COMPLETE SPECIFICATION
FOR A STANDARD PATENT**

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Invention Title: A Boom Attachment

Details of Associated Provisional Applications: PR1938 - 8 December 2000

The following statement is a full description of this invention, including the best method of performing it known to us:

Field of the Invention

This invention relates to a boom attachment for mounting to a vehicle. In particular, the invention relates to a boom attachment for a road maintenance vehicle.

5 The invention will be described by way of example with reference to a boom attachment for a road maintenance vehicle. It should be appreciated that this is by way of example and that the boom attachment may be secured to vehicles other than those intended for road maintenance. In addition, the boom attachment may be mounted to equipment or apparatus other than
10 vehicles.

Description of the Prior Art

Booms for use in road repair work are mounted to vehicles which carry a supply of aggregate and road emulsion. These vehicles are adapted to
15 direct a blast of air through a hose carried by the boom onto portions of a road to be repaired. The blast of air clears the portion of the road of any debris. Following this, aggregate is conveyed through the hose and into the portion of the road that is to be repaired. A second hose carried by the boom is employed to spray road emulsion into the aggregate stream via a nozzle
20 located at the end of the second hose.

The vehicle to which the boom is attached must be suitable for travelling on roads with other vehicles. For this reason, known boom attachments are configured for movement between an operative position and an inoperative or storage position. It is important that the storage position
25 results in a compact configuration so that the road travelling ability of the vehicle is not adversely affected.

One difficulty with known boom attachments is the efficient and effective conveying of the aggregate through and along the aggregate delivery hose. Aggregate can be particularly abrasive and unless due care is
30 taken, rapid wear and failure of the hose often results.

One known boom attachment consists of a mounting rail secured to the chassis of the vehicle so that it extends across the front ends of the

chassis rails of the vehicle and across a lower front region of the body or cabin of the vehicle. A telescopic boom arm is mounted to the mounting rail and is able to travel along the rail. The boom is mounted for pivotal movement about a vertical axis so that the boom may slew from side to side.

5 In addition, the boom may pivot about a horizontal axis to allow the free end of the boom to be raised and lowered.

Aggregate and emulsion delivery hoses extend through a guide tube mounted to pass over the roof of the vehicle cabin. The hoses extend from the guide tube to the free end of the boom. The tube is pivotally mounted. In 10 order to move the boom to its storage position, the boom is driven to one end of the mounting rail, the boom is retracted and then pivoted about a vertical axis to move the boom towards and against the rail. The hoses remain in their location extending across the roof of the cabin and down one side of the cabin. The hoses remain exposed when the boom is in the storage position.

15 With such an attachment the aggregate must be transported from a discharge opening in a lower part of a storage container, elevated to vehicle cab height and directed through the delivery hose. The transporting of the aggregate in this way is undesirable.

20 Another known boom attachment consists of a telescopic boom arm mounted to the lower front of a vehicle. The boom arm may be pivoted along a vertical axis to slew the arm and is also movable about a horizontal axis to allow the arm to be raised and lowered relative to the road.

Delivery hoses for the aggregate and emulsion extend from beneath the vehicle cabin and to the free end of the boom.

25 To move the attachment into its storage position the boom arm is retracted and the arm is pivoted about a horizontal axis until the arm is substantially upright adjacent to the cabin.

30 The boom attachment, when in the storage position, extends beyond the boundaries of the cabin. The hoses, because the length of the boom arm is reduced when it is retracted, assume a serpentine configuration which adds to the obtrusiveness of the arrangement.

It is an object of the present invention to provide a boom configuration

which at least minimises the disadvantages referred to above.

Summary of the Invention

According to one aspect of the present invention there is provided a
5 boom attachment for a road repair vehicle, the attachment having:

a mounting portion attachable to a front lower location of the vehicle for
pivotal movement about an axis extending across the vehicle;

10 a telescopic boom arm mounted to the mounting portion for pivotal
movement about an axis extending substantially at right angles to the axis
about which the mounting portion pivots relative to the vehicle;

a pivotable leading hose guide for supporting and guiding a leading
end portion of a delivery hose; and

15 a pivotable trailing hose guide for supporting and guiding a portion of
the hose spaced from the leading hose portion, whereby the boom arm is
movable between an extended position and a storage position, the hose
guides ensuring that the hose extends from the vehicle and that the hose is
50 maintained relatively straight when the arm is in the extended position, the
guides controlling the movement of the hose when the boom arm is moved
from the extended to the storage position.

20 The boom arm has an extension boom arm portion and a first boom
arm portion. The first boom arm portion is pivotally mounted to the mounting
portion. Any suitable means may be employed for extending and retracting
the extension arm portion relative to the first boom arm portion. Preferably a
25 cylinder assembly is employed for this purpose. In one embodiment the
boom arm is hollow and a cylinder assembly is located within the arm.

The leading hose guide may be pivotally attached to the boom arm.
30 Preferably the leading hose guide is attached to the extension boom arm
portion. In one embodiment the leading hose guide is pivotally mounted to a
free end of the extension boom arm portion. The leading hose guide may
have a support which extends along and engages with a length of the
aggregate delivery hose.

The trailing hose guide is located spaced from the leading hose guide.

Preferably the trailing hose guide is pivotally mounted to the mounting portion. The trailing guide preferably has a support which extends and engages with the delivery hose. Preferably the trailing hose guide has an arm pivotally coupled to the mounting portion and the support is pivotally coupled to the
5 arm of the guide.

In order that the invention may be more fully understood and put into practice, a preferred embodiment thereof will now be described with reference to the accompanying drawings.

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Brief Description of the Drawings

Fig. 1 is a perspective view of a boom attachment shown in its extended position;

Fig. 2 is a plan view of the boom attachment of Fig. 1 shown moved partially towards its storage position;

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Fig. 3 is a plan view of the boom attachment of Fig. 1 shown in its storage position; and

Fig. 4 is an inverted perspective view of the attachment as shown in Fig. 3.

20

Detailed Description

Fig. 1 shows a boom attachment 10 pivotally mounted to forward ends of vehicle chassis rails 11, 12. The attachment 10 has a mounting portion 13 which is substantially L-shaped having a portion 14 which, in use, extends across the front of a vehicle (not shown) and a minor forwardly directed portion 15 at one end of portion 14. The mounting portion 14 has two rearwardly directed attachment lugs 16 and 17 which are pivotally coupled by fasteners 18, 19 to extensions 20, 21 projecting from chassis rails 11 and 12. A cylinder assembly 22 having a cylinder 23 connected to a lug extending from rail 12 and a ram 24 connected to lug 25, extends between the rail 12 and the mounting portion 14. Assembly 22 is operable to pivot the portion 14 about an axis extending across the vehicle of which the rails 11 and 12 are a part.

The boom attachment 10 has a telescopic boom arm 30. The arm 30 includes a first boom arm portion 31 and an extension boom arm portion 32. A cylinder assembly (not visible in the drawing) is located within the boom arm, which is hollow, and functions to extend and retract the extension boom 5 portion 32 relative to portion 31.

Cylinder assembly 35 consists of a cylinder 36 pivotally mounted to lug 37 and a ram 38 pivotally mounted to lug 39. Assembly 35 extends between the portion 14 and the first boom arm portion 31 and is operative to pivot the boom arm 30 about pivot 40. Pivot 40 couples portion 31 to the forwardly 10 directed portion 15 of the mounting portion 13.

A delivery hose 50 is supported and carried by the boom attachment 10. The hose 50 has a downwardly directed free end 51 connected to a free end 55 of extension arm portion 32.

A leading hose guide 60 is pivotally coupled at 61 to the free end 55 of 15 arm portion 32. Guide 60 has a support 62 which extends along the hose 50. A second hose guide 63 consists of a guide arm 64 which is pivotally mounted to portion 14 and a support 65 which extends along the hose and is pivotally coupled to arm 64. The configuration shown allows the hose 50 to be supported and guided and allows the hose 50 to pass from beneath and 20 between the chassis rails 11, 12 and extends centrally of the vehicle of which the rails 11, 12 form a part. The portion of the hose 50 between the guides 60 and 63 extends substantially in a straight line. This ensures a relatively free and unimpeded flow path for the aggregate in its passage through the hose 50 and hence minimises wear to the hose 50.

25 Fig. 2 shows the boom attachment 10 with the extension boom arm portion 32 retracted relative to arm portion 31. In this view the hose guide 60 is pivoted and the support 62 is substantially parallel to and adjacent portion 31. Guide 63 assumes the position shown with guide arm 64 now pivoted relative to the portion 14 and rearwardly of that portion. The support 65 30 controls the folding of the hose 50.

Fig. 3 shows the boom attachment 10 in its storage position. In this position the boom arm 30 is retracted and pivoted to a position adjacent

portion 14.

Fig. 4 is an inverted perspective view of the boom attachment 10 shown in its storage position. By mounting and supporting the hose 50 in this way a particularly compact storage position for the hose 50 may be achieved.

5 This allows the boom attachment 10 to be carried by a vehicle at the leading ends of the chassis rails 11, 12. Controlled folding of the hose 50 is achieved by the guides 60 and 63 and when the boom attachment 10 is in its extended position the portion of the hose 50 between the hose guides 60, 63 is substantially straight and this minimises hose wear.

10 The boom attachment 10 shown in the drawings does not show the hose which delivers emulsion.

The boom attachment 10 allows the hose 50 to extend from beneath the vehicle and allows for a more efficient flow of aggregate from a storage container carried by the vehicle to which the attachment is mounted. The 15 presence of the guides allows the delivery hose to be maintained relatively straight when the boom arm is extended and provides for a controlled progression of hose folding when the attachment is moved towards its storage position. When in the storage position the delivery hose is maintained in a compact folded position.

20 The foregoing describes only one embodiment of the present invention and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope of the present invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A boom attachment for a road repair vehicle, the attachment having:
 - a mounting portion attachable to a front lower location of the vehicle for pivotal movement about an axis extending across the vehicle;
 - 5 a telescopic boom arm mounted to the mounting portion for pivotal movement about an axis extending substantially at right angles to the axis about which the mounting portion pivots relative to the vehicle;
 - a pivotable leading hose guide for supporting and guiding a leading end portion of a delivery hose; and
- 10 a pivotable trailing hose guide for supporting and guiding a portion of the hose spaced from the leading hose portion, whereby the boom arm is movable between an extended position and a storage position, the hose guides ensuring that the hose extends from the vehicle and that the hose is maintained relatively straight when the arm is in the extended position, the guides controlling the movement of the hose when the boom arm is moved from the extended to the storage position.
2. The boom attachment of claim 1, wherein the boom arm has an extension boom arm portion and a first boom arm portion.
3. The boom attachment of claim 2, wherein the first boom arm portion is 20 pivotally mounted to the mounting portion.
4. The boom attachment of claim 2 or 3, wherein the boom arm includes a means for extending and retracting the extension arm portion relative to the first boom arm portion.
5. The boom attachment of claim 4, wherein the means for extending and 25 retracting the extension arm portion relative to the first boom arm portion includes a cylinder assembly.
6. The boom attachment of claim 5, wherein the boom arm is hollow and the cylinder assembly is located within the boom arm.
7. The boom attachment of any one of the previous claims, wherein the 30 leading hose guide is pivotally attached to the boom arm.
8. The boom attachment of any one of claims 2 to 6, wherein the leading hose guide is pivotally attached to the extension boom arm portion.

9. The boom attachment of claim 8, wherein the leading hose guide is pivotally mounted to a free end of the extension boom arm portion.
10. The boom attachment of any one of the previous claims, wherein the leading hose guide has a support which extends along and engages with a length of the delivery hose.
11. The boom attachment of any one of the previous claims, wherein the trailing hose guide is located spaced from the leading hose guide.
12. The boom attachment of any one of the previous claims, wherein the trailing hose guide is pivotally mounted to the mounting portion.
- 10 13. The boom attachment of any one of the previous claims, wherein the trailing hose guide has a support which extends along and engages with a length of the delivery hose.
14. The boom attachment of claim 13, wherein the trailing hose guide has an arm pivotally coupled to the mounting portion and the support is pivotally coupled to the arm of the guide.
- 15 15. A boom attachment for a road repair vehicle, the boom attachment being substantially as herein described with reference to the drawings.

DATED this 21st day of November 2001

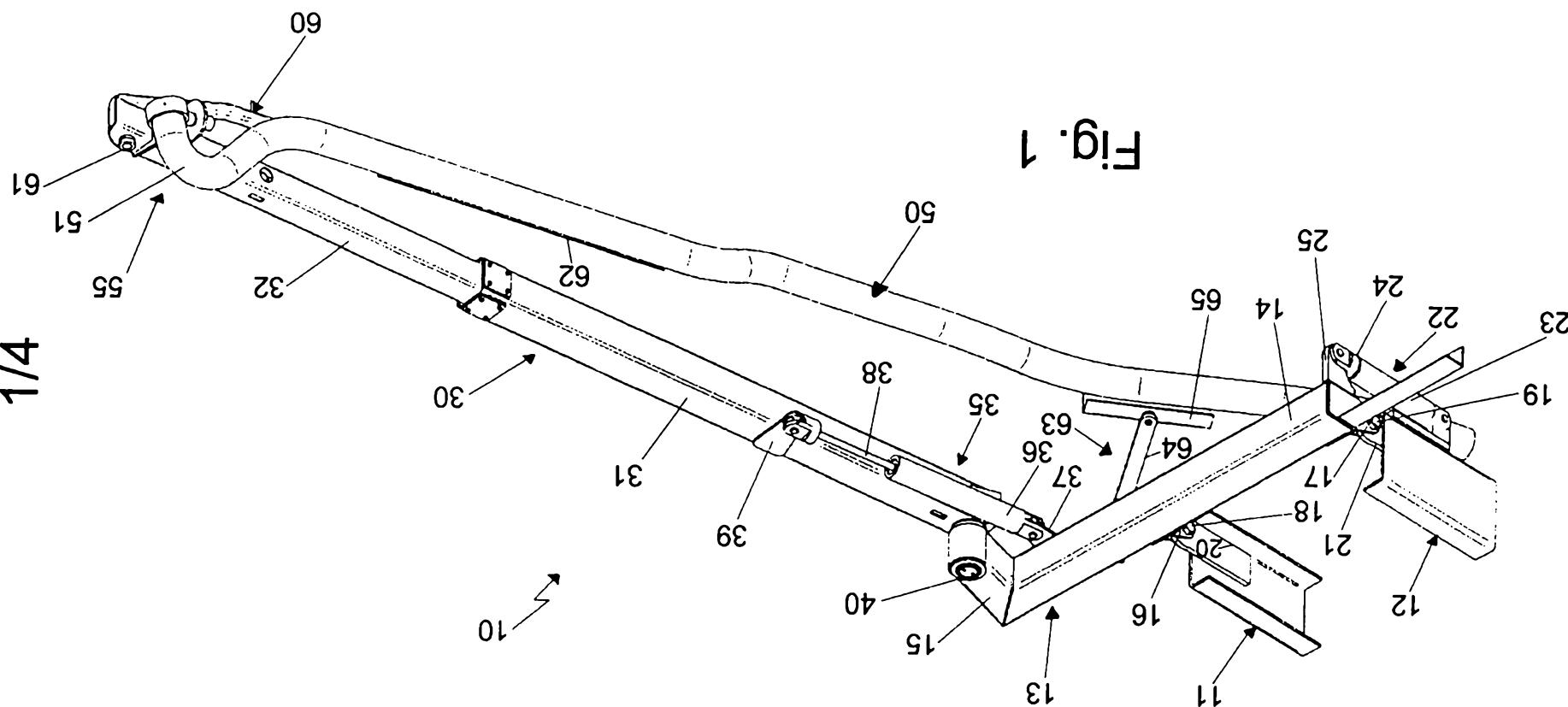
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By their Patent Attorneys

CULLEN & CO.

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Fig. 1



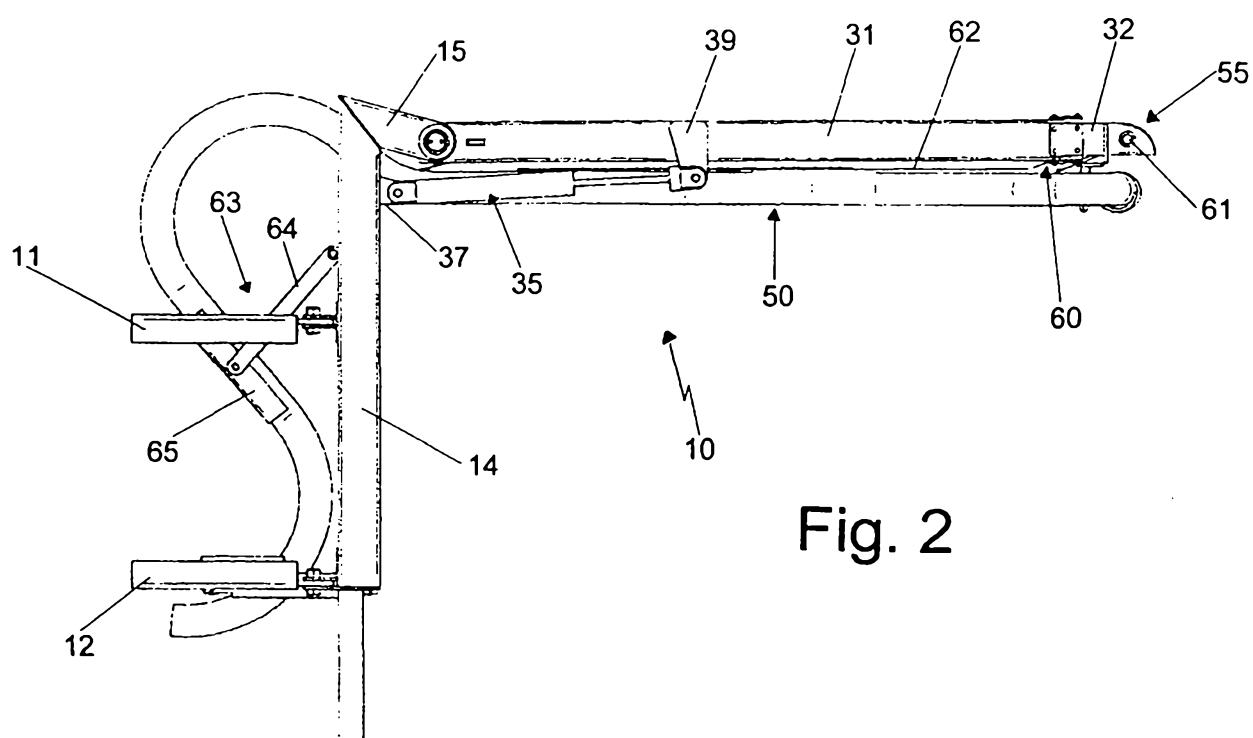


Fig. 2

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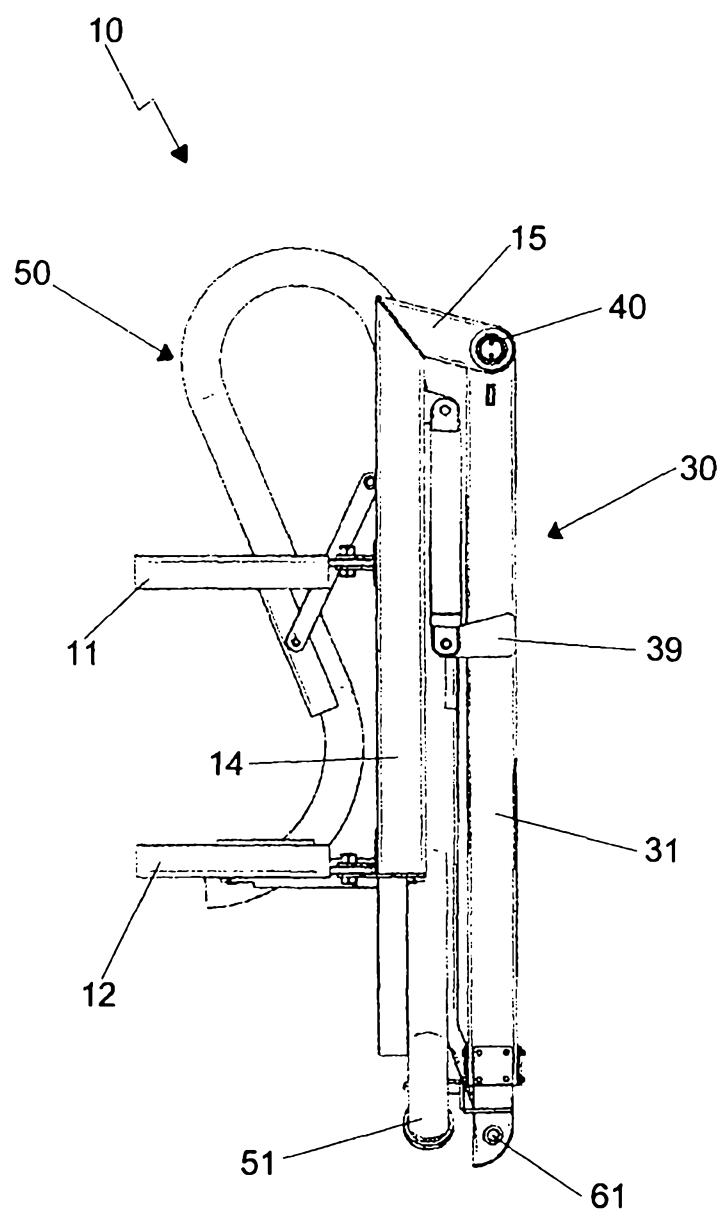


Fig. 3

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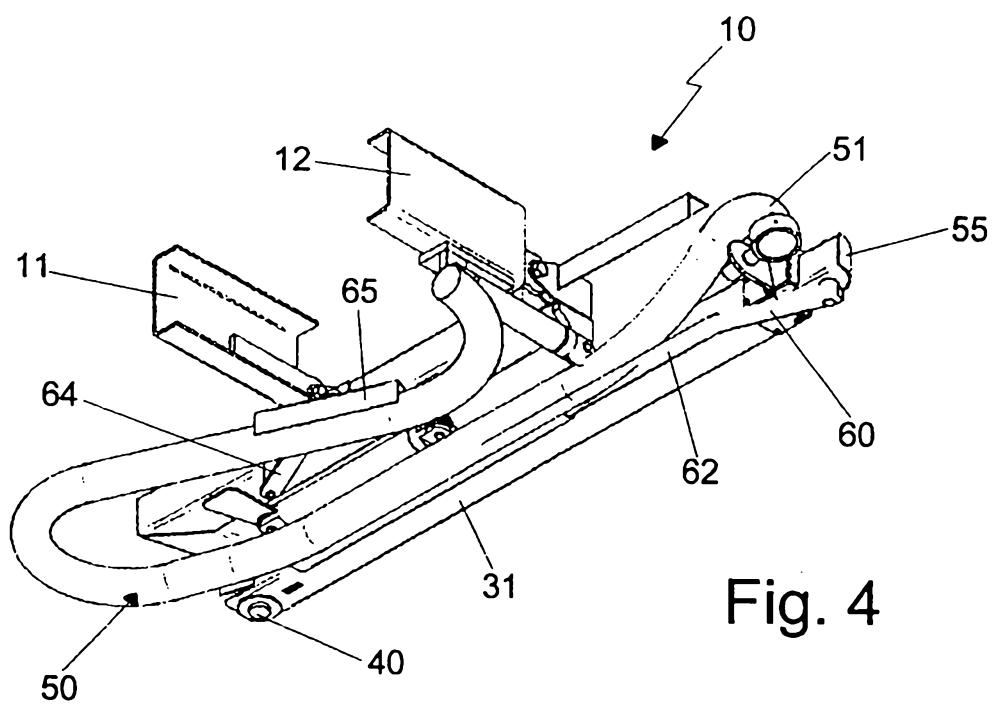


Fig. 4