



(19)

Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 701 962 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
20.03.1996 Bulletin 1996/12

(51) Int. Cl.⁶: **B66C 1/24**, B66C 1/10

(21) Application number: **95202516.1**

(22) Date of filing: **18.09.1995**

(84) Designated Contracting States:
BE DE GB NL

(30) Priority: **19.09.1994 NL 9401512**

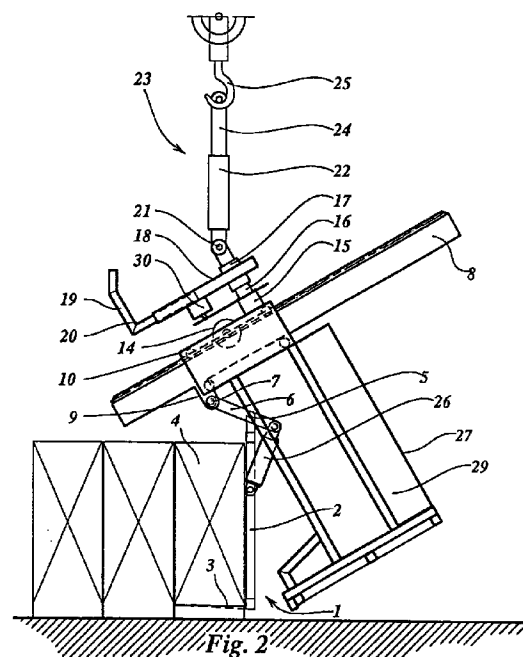
(71) Applicant: **van der Wurff, Marinus Antonius**
NL-6224 CE Maastricht (NL)

(72) Inventor: **van der Wurff, Marinus Antonius**
NL-6224 CE Maastricht (NL)

(74) Representative: **Vollebregt, Cornelis Jacobus, Ir.**
et al
Algemeen Octrooibureau
World Trade Center
P.O. Box 645
NL-5600 AP Eindhoven (NL)

(54) Device for moving loads

(57) The invention relates to a device for moving loads by means of a crane or the like, said device being provided with a pick-up means (1) comprising load-bearing parts (3) to be placed under a load (4) to be moved for supporting said load (4), said pick-up means (1) being connected to a frame (18) in such manner as to pivot about a horizontal pivot axis (7), which frame (18) can be coupled to a crane or the like in such manner as to pivot about a horizontal pivot axis (21), whereby the pick-up means (1) is pivoted to a carrier (8), which is supported by a guide means (10), with respect to which the carrier (8) can be moved by driving means.



EP 0 701 962 A1

Description

The invention relates to a device for moving loads by means of a crane or the like, said device being provided with a pick-up means comprising load-bearing parts to be placed under a load to be moved for supporting said load, said pick-up means being connected to a frame in such manner as to be pivotable about a horizontal pivot axis, which frame can be coupled to a crane or the like in such manner as to be pivotable about a horizontal pivot axis.

A device of this type, which is in particular intended for moving packs of bricks supplied at a building site from the ground to a scaffold, is known from German Patent Application No. 3,518,837. In this known construction a bracket is mounted on the upper side of the pick-up means, which bracket is provided with a few hooks, by means of which a coupling piece, which can move along the bracket, can be locked against being moved with respect to the bracket. This coupling piece is in turn coupled to a frame part to be coupled to a crane or the like, whereby said coupling piece is movable in a slotted hole with respect to said frame part. Generally at least one additional person will be needed besides the operator of the crane or the like when using the device, in order to ensure that the loads are picked up and put down in a correct manner. With this known device the movements of the various parts with respect to each other are difficult to control, as a result of which the pick-up means may make unexpected movements, for example, which may lead to dangerous situations for persons working near the device.

The object of the invention is to obtain a device of the above kind, which is designed such that the movements of the various parts can be properly controlled, and whereby the risk of damage to the device and/or to loads and the like to be picked up by means of the device is avoided, whilst the device can generally be operated by one person.

According to the invention this can be accomplished in that said pick-up means is pivoted to a carrier, which is supported by a guide means, with respect to which said carrier can be moved by driving means.

The invention will be explained in more detail hereafter with reference to an embodiment of a device according to the invention diagrammatically illustrated in the accompanying Figures.

Figure 1 is a schematic side view of the device as it will be suspended in unloaded condition from a crane or the like.

Figure 2 is a side view of the device picking up a load in the shape of a pack of bricks or the like.

Figure 3 is a side view of the device while transporting a load.

Figure 4 is a side view of the device disposed near a scaffolding structure.

Figure 5 is a side view of the device while placing a load in the shape of a pack of bricks on a scaffold.

The device according to the invention is in particular intended for moving packs of bricks on a building site. For this purpose the device is provided with a pick-up means 1 in the shape of so-called brick tongs of a type as described in British Patent No. 1,492,566. Such brick tongs are provided with an upwardly extending frame part 2, to the bottom side of which teeth 3 are secured, which can be moved under a pack of bricks 4 (Figure 2). Said teeth 3 are thereby provided with clamping parts, by means of which spaced-apart lowermost bricks supporting the pack can be clamped down, all this as described in the aforesaid British Patent No. 1,492,566, whose contents are considered to be incorporated herein by this reference.

The upper end of the frame part 2 of the brick tongs 1 is coupled to a coupling arm 6 by means of a horizontally extending pivot axis 5, in a point located between the ends of said coupling arm.

One end of the coupling arm 6 is coupled to an ear 9 secured to a carrier or beam 8 by means of a pivot axis 7 extending parallel to pivot axis 5. The beam 8 is supported by a box-shaped guide means 10 in such manner as to be movable in its longitudinal direction, said beam 8 being guided in said guide means 10 by means of a few guide wheels 11. A rack 12 extending in the longitudinal direction of the beam 8 is provided on the upper side of said beam, said rack being in engagement a pinion 13, which is mounted on the outgoing shaft of a motor 14 mounted on the guide means 10, which is preferably a hydromotor.

The guide box 10 is rotatably connected to a shaft 16 by means of a hub 15 secured to the guide box 10, whereby the central axis of said shaft extends perpendicularly to the longitudinal direction of the beam 8. Means are provided which prevent the hub 15 from moving in the longitudinal direction of the shaft 16.

A framework 18 is coupled to the shaft 16 by means of a further hub 17 surrounding the shaft 16, which is rotatable with respect to the shaft 16 but which is unable to move in the longitudinal direction of the shaft. An upwardly extending stop means 19 is connected to said framework by means of a coupling piece 20 which is movably provided within said framework, all this in such a manner that said stop means 19 can move out slightly resiliently in a direction perpendicular to the central axis of the shaft 16. The stop means thereby extends perpendicularly to the plane of the drawing over a certain distance.

The upper end of the shaft 16 is pivoted to one end of a cylinder housing 22 of a setting cylinder 23 by means of horizontal pivot axis 21. The free end of the piston rod 24 of the setting cylinder 23 projecting from the cylinder housing 22 can be coupled to a hook 25 of a crane or the like hoisting device, as is diagrammatically illustrated in Figure 2.

A further setting cylinder 26 is provided between the end of the coupling arm 6 remote from the pivot axis 7 and a point of the upwardly extending frame part 2 of the

brick tongs 1 located some distance below the pivot axis 5.

Furthermore a cage-like means 27 is secured to the guide box 10, which can accommodate the brick tongs, as will be apparent from the Figures. A support 28 is provided on the bottom side of the cage-like means 27, which support can be moved with respect to said cage-like means by means not shown, such as a setting cylinder or the like, between a retracted position shown in Figures 1 - 3 and an extended position with respect to the cage 27 shown in Figures 4 and 5.

A stop means 29 is furthermore provided in the cage 27, which stop means cooperates with the brick tongs so as to prevent undesirable pivoting of the cage 27 and the brick tongs 1 relative to each other.

Furthermore a motor 30, for example a hydromotor, is mounted on the framework, said motor being coupled to the hub 15 by means of a chain or belt transmission 31.

Figure 1 shows a starting position of the device, wherein the carrier or beam 8 has been moved to a final position with respect to the guide box 10, and wherein the brick tongs 1 are positioned within the cage 27 in unloaded condition. The weight distribution is thereby such that the beam 8 extends at least substantially horizontally and the shaft 16 is in line with the setting cylinder 23, whilst the empty brick tongs 1 butt against the stop 29 in a slightly rearwardly sloping position. Both the setting cylinder 22 and the setting cylinder 26 are in their fully retracted positions.

When a pack of bricks is to be picked up, the beam 8 and the brick tongs 1 suspended therefrom will be moved with respect to the guide box 10, to the position shown in Figure 2, by operating the motor 14. As a result of this the centre of gravity of the device will be shifted, causing the device to pivot about the pivot axis 21 with respect to the setting cylinder 23, to the position shown in Figure 2. The brick tongs 1, which have been moved from their position within the cage 27, have thereby been pivoted about the pivot axis 7 with respect to the beam 8, to a position in which the part 2 extends at least substantially vertically and in which the teeth 3 extend at least substantially horizontally.

In this position the coupling arm 6 may be locked against pivoting about the pivot axis 7 with respect to the beam 8 by means of a remotely controlled locking means (not shown), if desired.

The teeth 3 can now be moved under the pack and between the so-called foot bricks supporting the pack by suitably manipulating the crane and extending the setting cylinder 23. Following that the possible locking of the pivoting movement about the pivot pin 7 may be released again.

Subsequently the foot bricks will be clamped between the teeth 3, as for example described in British Patent No. 1,492,566. After said clamping of the foot bricks the setting cylinder 26 may be operated, possibly automatically, in such a manner that said setting cylinder 26 will telescope out, causing the coupling arm 6 to pivot about the pivot axis 7 and thus causing the brick tongs

1, which are now in loaded condition, to move upward. The brick tongs 1 will tilt a little further out of the cage thereby, that is, the beam 8 will tilt a little further from the position shown in Figure 2.

Then the setting cylinder 23 is retracted again and the pack of bricks is moved further upward by means of the crane of the like. By operating the motor 14 also the beam 8 and the brick tongs supported by said beam are moved with respect to the guide box 10, so that the brick tongs 1 are moved into the cage again until they strike the stop 29. The brick tongs will then occupy a slightly rearwardly sloping position in the cage, as is shown in Figure 3, so that any risk of the pack of bricks falling from the brick tongs during the further transport is practically excluded. In this situation the centre of gravity of the device in loaded condition will be located on the extension of the central axis of the setting cylinder 23, and the beam 8 will occupy an at least substantially horizontal position.

During the movement of the device in the direction of a scaffold, on which the picked-up pack of bricks is to be placed, the hydromotor 30 may be operated. As a result of this the framework 18 and the stop means 19 supported thereby will rotate about the shaft 16 in one direction and the guide box 10 and the parts supported thereby will rotate about the shaft 16 in the opposite direction. As a result of the selected design of the chain or belt transmission 31 the framework 18 will thereby rotate faster about the shaft 16 than does the guide box 10.

It is thereby possible, by using control means (not shown), to achieve that the motor 30 stops automatically when the stop means 19 has reached a position in which said stop means 19 extends parallel to the longitudinal direction of a scaffolding floor 32 (Figure 5).

Means are thereby provided which prevent the beam 8 from turning through more than about 90° in the one or the other direction with respect to the stop means 19 from the position shown in Figure 3, in which said stop means 19 extends perpendicularly to the longitudinal direction of said beam 8, in order to prevent the beam 8 projecting from the cage 27 from getting between scaffolding floors 32 and 32', which are located one above the other, when the device is moving in the direction of the scaffold.

Then the crane is manipulated in such a manner that the stop means 19 will abut against a longitudinal edge of a scaffolding floor 32, which is located above scaffolding floor 32', on which the pack of bricks 4 is to be placed. Since the stop means 19 can move out slightly resiliently in a direction perpendicular to the shaft 16, it is thereby avoided that undesirable forces are exerted on the scaffolding floor 32 or on the device.

Once the stop means 19 abuts against a scaffolding floor in the manner shown in Figure 4, the hydromotor 30 is operated again, if necessary. The stop means 19 abutting against the scaffolding floor 32 cannot pivot any more, and only the guide box 10 and the cage 27 and brick tongs 1 supported thereby will be pivoted, to a posi-

tion in which the beam 8 extends substantially perpendicularly to the longitudinal direction of the respective scaffolding floors 32 and 32'. It is thereby possible, using control means which are not shown and which are not described herein, to achieve that the motor 30 stops automatically when the cage has reached its desired position with respect to the scaffold. Then the support 28 may be extended, so that said support will come to lie above the scaffolding floor 32'.

Then the device will be moved down by operating the setting cylinder 23, until the support 28 comes into contact with the scaffolding floor 32', whereupon the telescoping movement of the setting cylinder 23 is stopped. Then the motor 14 is operated in order to move the beam 8 supporting the brick tongs 1 in its longitudinal direction with respect to the guide box 10, to a position in which the loaded brick tongs 1 are positioned above the scaffolding floor 32'. The part of the device supporting the brick tongs 1 is thereby prevented from pivoting about the pivot pin 21 by the support 28 resting on the scaffolding floor 32'.

Then the setting cylinder 26 may be operated in order to tilt the tongs 1 back to the position in which the teeth 3 of the brick tongs extend at least substantially horizontally and in which the foot bricks will come to rest on the scaffolding floor 32'. After that the clamping means of the brick tongs may be activated to release the foot bricks, whereupon the carrier 8 can be moved to the right, seen in Figure 5, by operating the motor 14 and the teeth 3 of the brick tongs 1 can be pulled away from their position under the pack. Then the support 28 may be retracted and the device is ready to pick up a new pack again.

It will be apparent that the above-described construction of the device according to the invention makes it possible to control all movements accurately, either automatically or by manipulation of the operator, as a result of which an operator is able to move loads in a properly controllable manner.

Furthermore it will be apparent that although hereinbefore the invention has been explained with regard to moving a pack of bricks, the invention can also be used for moving other loads, whereby the brick tongs 1 may be replaced by pick-up means suitable for picking up such other loads.

Claims

1. A device for moving loads by means of a crane or the like, said device being provided with a pick-up means comprising load-bearing parts to be placed under a load to be moved for supporting said load, said pick-up means being connected to a frame in such manner as to pivot about a horizontal pivot axis, which frame can be coupled to a crane or the like in such manner as to pivot about a horizontal pivot axis, characterized in that said pick-up means is pivoted to a carrier, which is supported by a guide means,

with respect to which said carrier can be moved by driving means.

2. A device according to claim 1, characterized in that said pick-up means is pivoted to an arm, which is pivoted to said carrier near one end, whilst a setting cylinder is provided between the other end of said arm and said pick-up means.
3. A device according to claim 2, characterized in that said carrier is an elongated beam, in which a rack is mounted, which is in engagement with a pinion, which is mounted on the outgoing shaft of a motor mounted on said guide means.
4. A device according to claim 1 or 2, characterized in that said guide means is capable of rotation about an upwardly extending axis.
5. A device according to claim 4, characterized in that said upwardly extending axis is pivotally coupled to an upwardly extending setting cylinder.
6. A device according to claim 4 or 5, characterized in that a stop means is connected to said upwardly extending axis.
7. A device according to claim 6, characterized in that said stop means is rotatable about said upwardly extending axis.
8. A device according to claim 6 or 7, characterized in that a driving mechanism is provided between said stop means, which is rotatable about said axis, and said guide means, which is rotatable about said axis.
9. A device according to any one of the preceding claims 5 - 8, characterized in that said stop means is resiliently movable in a direction perpendicularly to said upwardly extending axis.
10. A device according to any one of the preceding claims, characterized in that a cage is secured to said guide means, which cage can accommodate said pick-up means and a load supported by said pick-up means.
11. A device according to claim 10, characterized in that said cage is provided with a projecting supporting means near its bottom end.

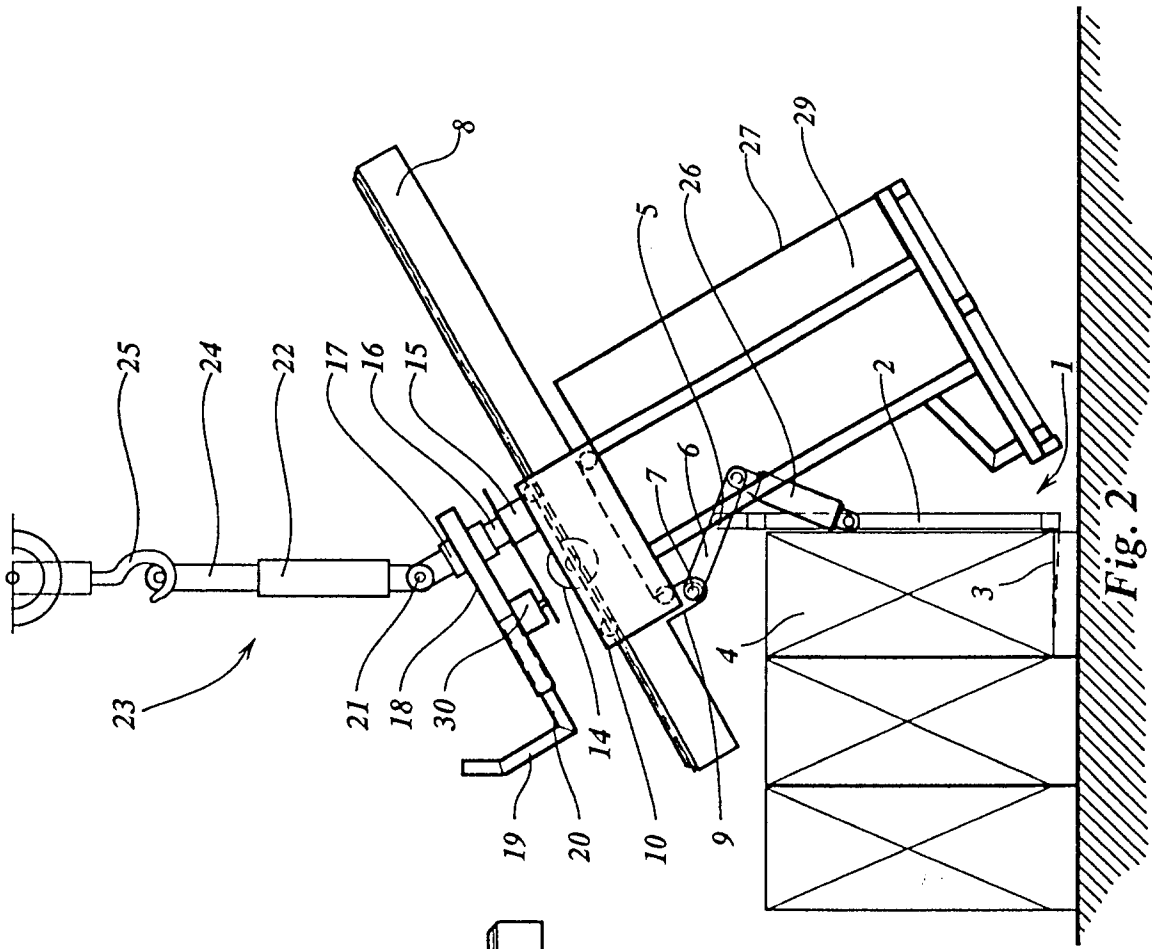


Fig. 1

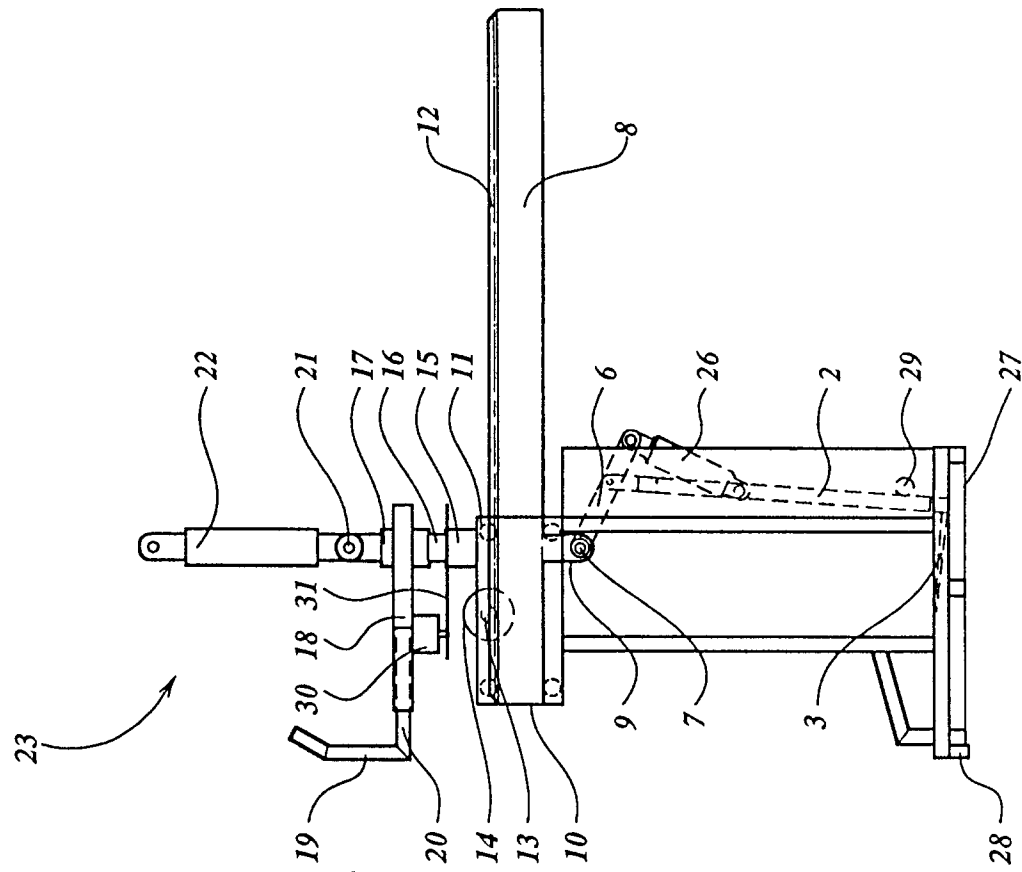


Fig. 2

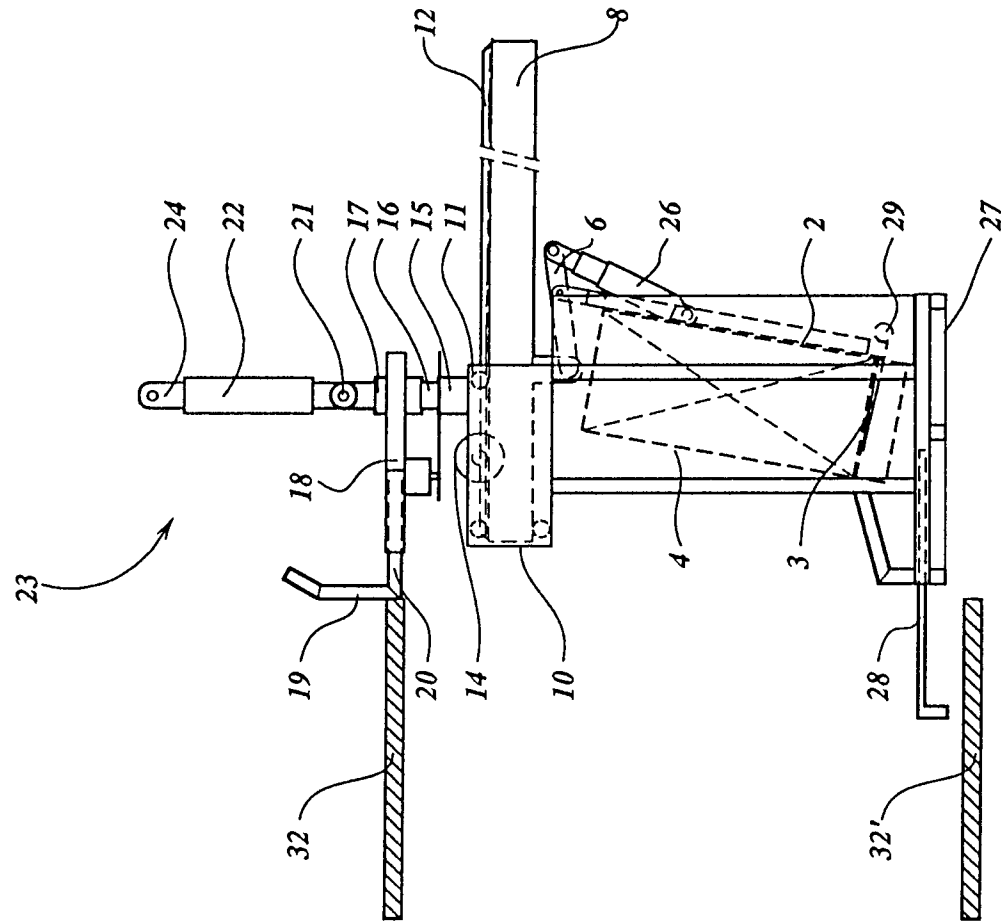


Fig. 4

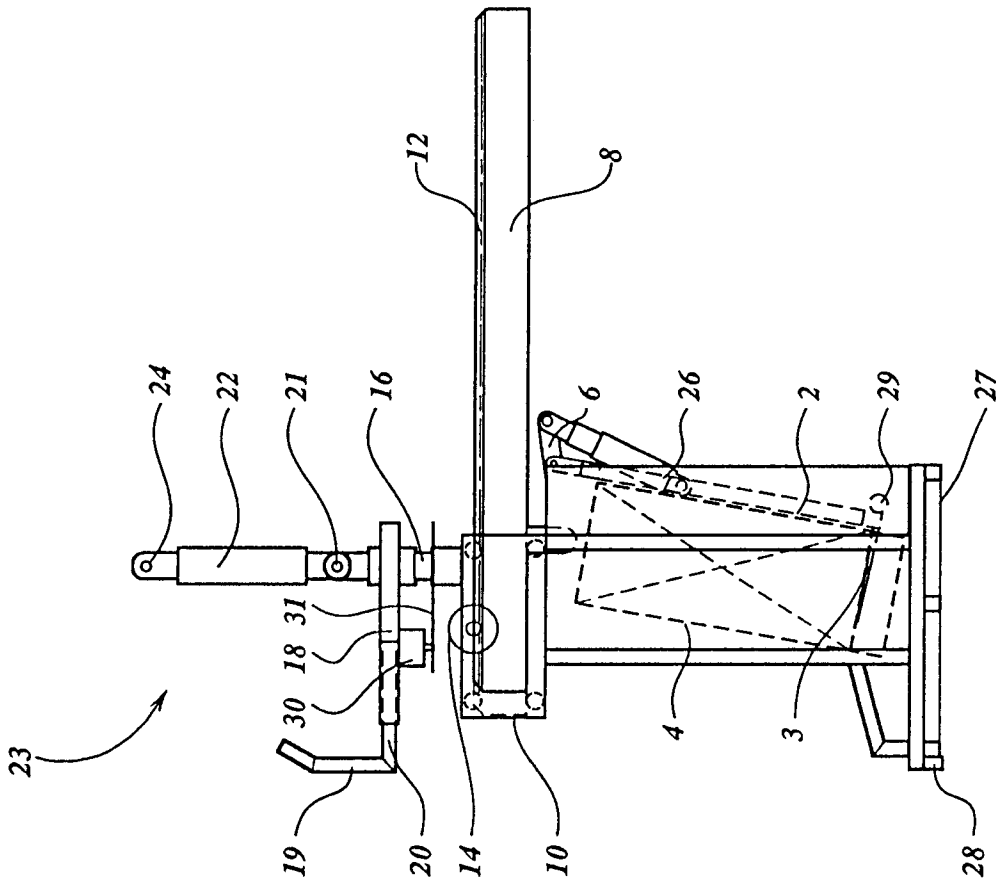


Fig. 3

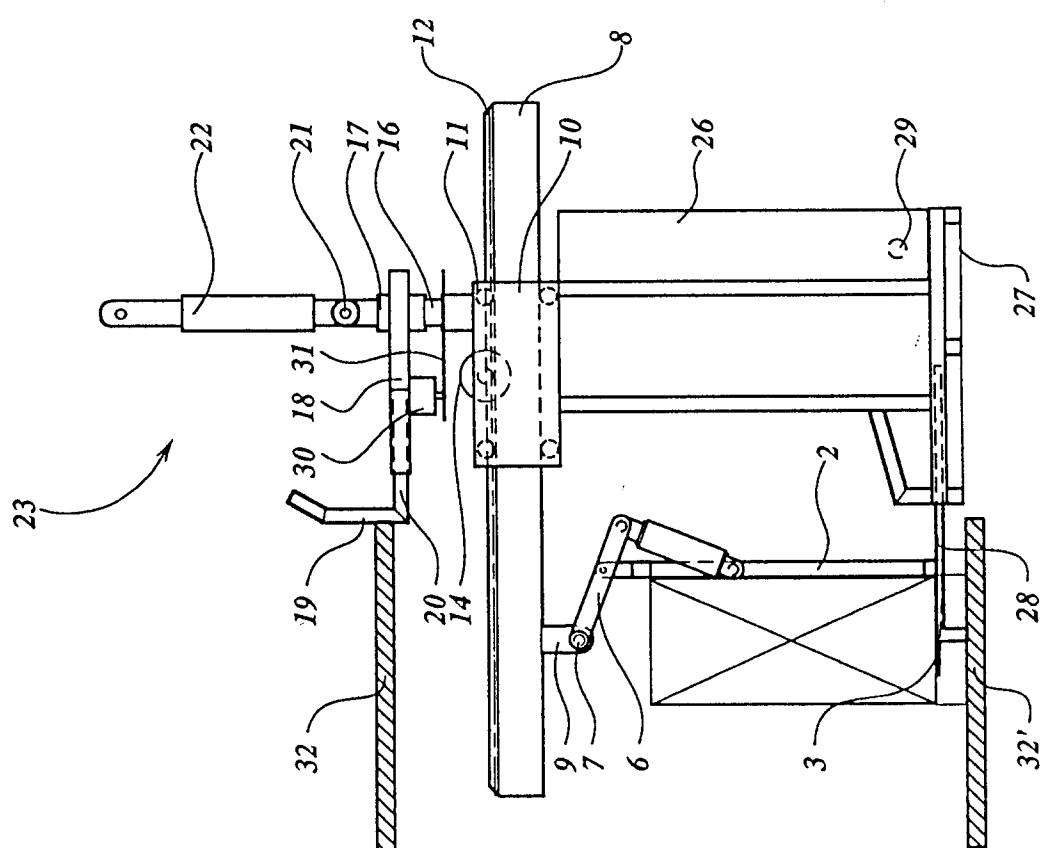


Fig. 5



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 20 2516

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	NL-A-6 711 651 (POMPE) * the whole document * ---	1	B66C1/24 B66C1/10
X	DE-A-15 31 243 (POMPE) * page 48, paragraph 2 - page 49, paragraph 2 * ---	1	
A	NL-A-6 802 347 (BOUWMAATSCHAPPIJ VERMEULEN) ---		
A	DE-A-22 30 355 (SAETHER) ---		
A,D	DE-A-35 18 837 (ITURRIAGA) -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B66C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 1 December 1995	Examiner Van den Berghe, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.92 (P04C01)