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(54) **Tyre unpacking machine**

(57) The subject of the invention is the device for pulling out a single tyre from a tyre bundle the device has (having) a frame (1) which has slide guides on which a moveable clamp of the stretcher (3) moves, and between which there is a horizontally attached fixed clamp of the

stretcher (2) and a vertically attached prop (4), which has an arm (5) on its end powered by a driving element and having a catching or hooking element at the end(8).

The second subject of the invention is the method of unpacking tyres

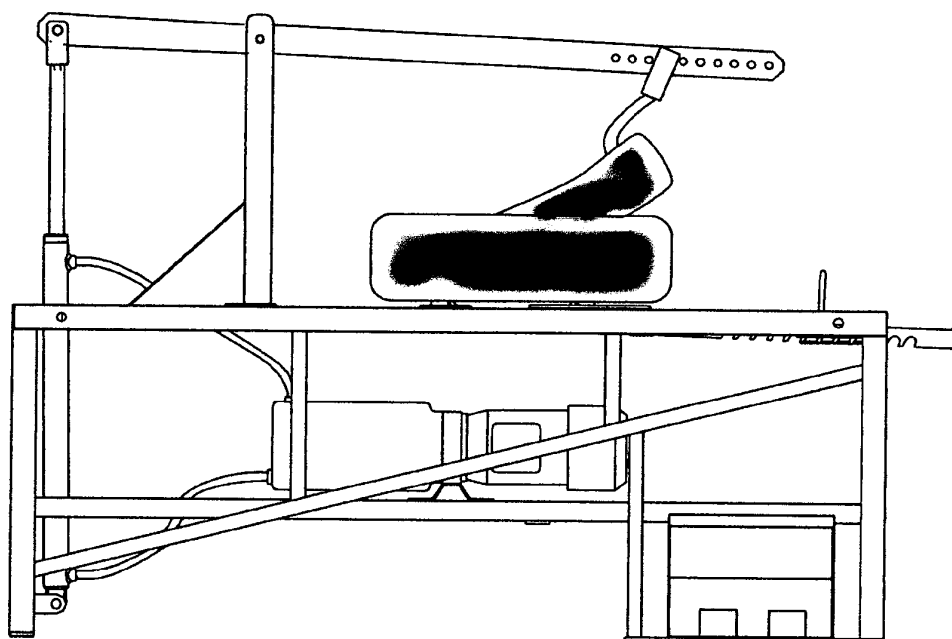


Fig. 8

Description

[0001] The invention has an application in automobile industry, especially in tyre transport and warehousing.

[0002] Together with the development of automobile industry there appeared the problem of warehousing space and transport method of large quantities of tyres. Doubling or tripling tyres allows to save a lot of space. The packing of tyres is possible e.g., with the use of the machine acc. to the patent EP 0723914 or WO 2009007796.

[0003] It is necessary after transporting the tyres to the place of destination to unpack the bundles of tyres. The subject of the invention is a device for pulling out a single tyre from a tyre bundle having an arm, characterized by the fact that its sides are also parallel slide guides to which a fixed clamp of the stretcher is attached and on which a sliding clamp of the stretcher moves.

[0004] In an advantageous representation the device is characterized by the outrigger being vertically attached to the frame. In its end it has an arm attached in a swinging way which allows for its rotation movement perpendicularly to the ground and parallel to the slide guides. In another advantageous representation the device is characterised by having a hydraulic or pneumatic actuator as its driving element that is controlled with a suitable type of a distributor or valve.

[0005] The second subject of the invention is the method of unpacking a tyre from a tyre bundle consisting in:

- a) putting a tyre bundle on the clamps on the frame,
- b) sliding the movable clamp on the slide guides and fixing the tyres,
- c) locking the moveable clamp,
- d) lowering the arm with a hook attached on its end,
- e) catching a tyre with the hook,
- f) raising the arm with the hook attached on its end together with the tyre,
- g) removing the remaining tyres.

[0006] Thanks to using the device according to the invention it is possible to unpack a single tyre from a tyre bundle in a simple way. During unpacking there are no complicated movements made. The device itself can be characterised by a simple design and relatively small dimensions.

[0007] The implementation of the invention is exemplified in the attached figures: fig. 1 - presents axonometric view, fig. 2 - side view of the device, fig. 3 - top view with a tyre on, fig. 6 - side view (the first stage of tyre unpacking), fig. 7 - side view (the second stage of tyre unpacking), fig. 8 - side view (the third stage of tyre unpacking), fig. 9 - side view (the fourth stage of tyre unpacking).

Example 1 The device

[0008] The device has a frame (1) made of steel sec-

tions. In its design the frame resembles a rectangular table. In a top view it has a shape of an rectangle. Inside the rectangle parallel to the shorter sides there are two metal plates forming crossbars joining two longer sides of the frame (1).

[0009] There is a immovable clamp of the stretcher (2) attached on one of the crossbars. In a top view the immovable clamp (2) of the stretcher resembles an arch with the chord situated parallel to the shorter sides of the frame (1).

[0010] The other crossbar joining the longer sides of the frame (1) has a prop fixed whose longer axis runs through the plane perpendicular to the ground and the longer axis of the rectangle of the frame (1). The prop (4) is made of flat bars joined parallel with their bigger planes with the space between them made by distance pieces. The prop (4) in the side view resembles a long rectangle fixed in such a way that its longer side is perpendicular to the ground. At the end of the prop (4) there is an arm fixed in a swinging way that allows the arm (5) together with the hook (8) only for movement in the plane perpendicular to the ground and running through the longer axis of the rectangle of the frame (1). The operating element of the device is a hydraulic actuator (6), which is fixed to the frame (1) on a joint from one side, and to the arm (5) from the other.

[0011] Along the longer sides of the frame (1) being at the same time slide guides a moveable clamp of the stretcher (3) moves. It consists of a steel plate with a fixed steel section resembling in the top view an arch with a chord. At the bottom of the plate there are guiding elements allowing only for the movement of the clamp (3) parallel to the longer sides of the frame (1). The moveable clamp of the stretcher (3) has a pawl lever fixed in a swinging way that allows the pawl lever to move parallel to the longer sides of the frame (1). The pawl lever is a notched flat bar which after putting on the pawl bar being one of the shorter sides of the frame (1) locks the moveable clamp of the stretcher (3) causing the fixing (blocking) of a tyre bundle.

Example 2 Method of unpacking tyres

[0012] Having a tyre bundle consisting of a smaller tyre inside a bigger one, we start unpacking from placing the tyre bundle on the frame (1) with tyre main axis perpendicular to the ground and having immovable clamp of the stretcher and moveable clamp of the stretcher placed inside the tyre bundle. Lifting and moving pawl lever (7) results in holding the tyres and the moveable clamp of the stretcher being locked after lowering the pawl lever (7).

[0013] The stage of unpacking the tyres starts with lowering the arm (5) with the hook (8) and then catching the inner tyre with the hook from inside. The next step is lifting the arm (5) with a hooked tyre which results in unpacking a tyre from a tyre bundle.

Claims

1. The device for pulling out a single tyre from a tyre bundle having a frame (1) which has slide guides on which a movable clamp of the stretcher (3) moves, and between which there are a horizontally attached fixed clamp of the stretcher (2) and a vertically attached prop (4), which has the arm (5) on its end powered by a driving element and having a catching or hooking element at the end (8). 5
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2. The device according to the claim 1 **characterized by** having the arm (5) fixed in a swinging way on the prop (4). 15
3. The device according to claim 1 **characterized by** its frame (1) having the slide guides on which a movable clamp of the stretcher (3) moves. 20
4. The device according to claim 1 **characterized by** a hydraulic or pneumatic actuator (6) as its driving element. 20
5. The method of unpacking a tyre from a tyre bundle **characterised by** involving: 25
 - a) putting a tyre bundle on the clamp (2) and clamp(3) on the frame (1)
 - b) moving the clamp (3) along the slide guides on the frame by (1) putting the pawl lever (7) towards the pawl lever (7) 30
 - c) locking the pawl lever (7),
 - d) the rotation of the arm (5) and the hook (8) with the driving element operated with the controlling element making the hook (8) approach the clamp (3). 35
 - e) catching a tyre with the hook (8)
 - f) the rotation of the arm (5) and the hook (8) with the driving element operated with the controlling element making the hook (8) move away from the clamp (3). 40
 - g) unlocking the pawl lever (7)
 - h) moving the clamp (3) along the slide guides on the frame (1), with the pawl lever (7) towards the prop (4), 45
 - i) removing a tyre from the frame (1)

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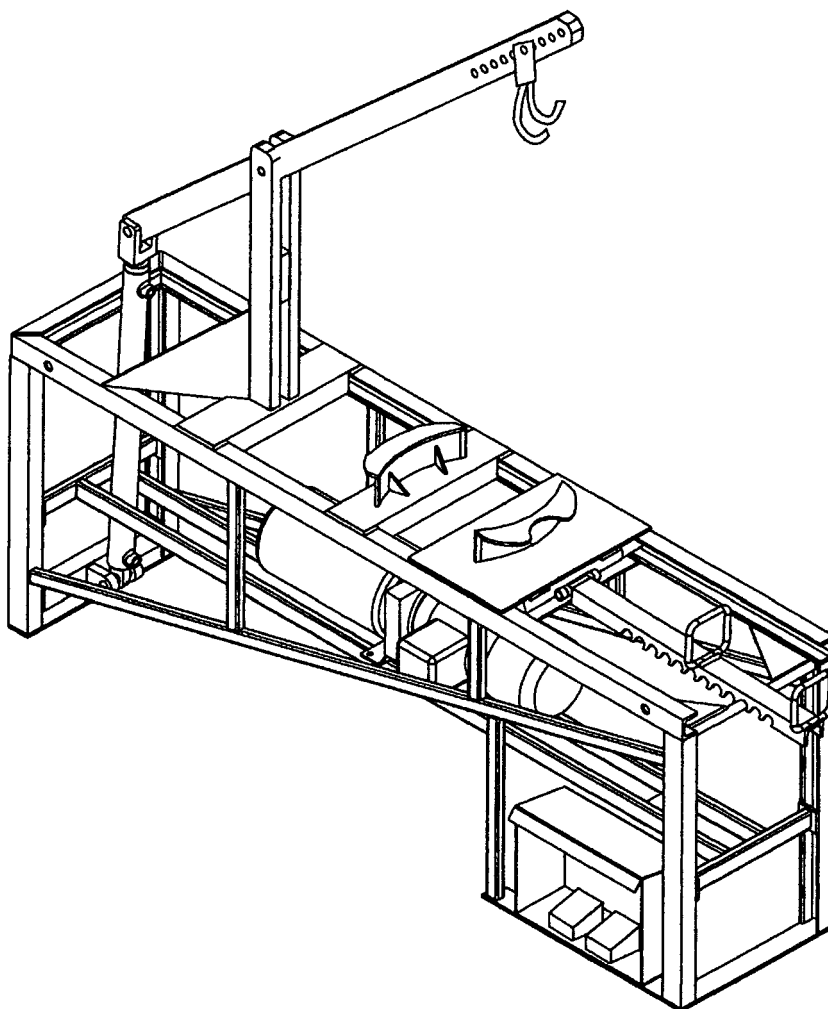


Fig. 1

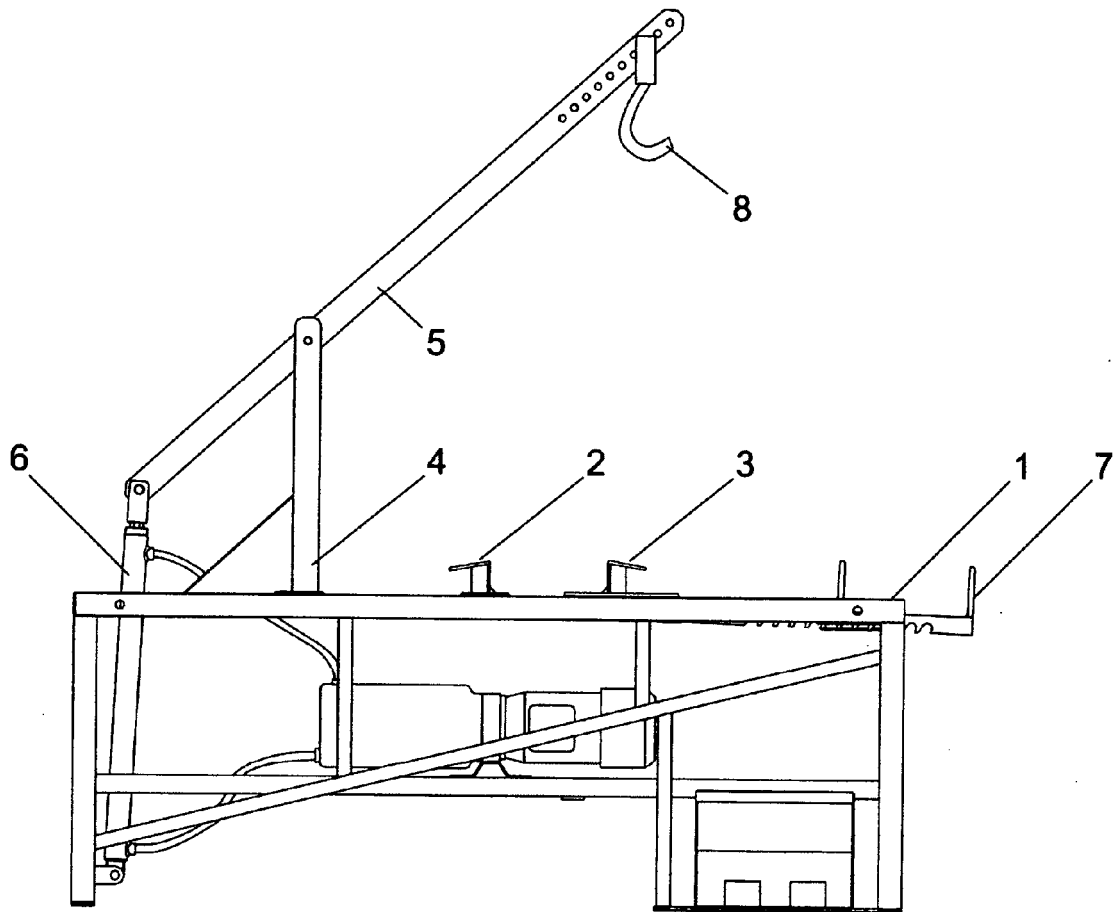


Fig. 2

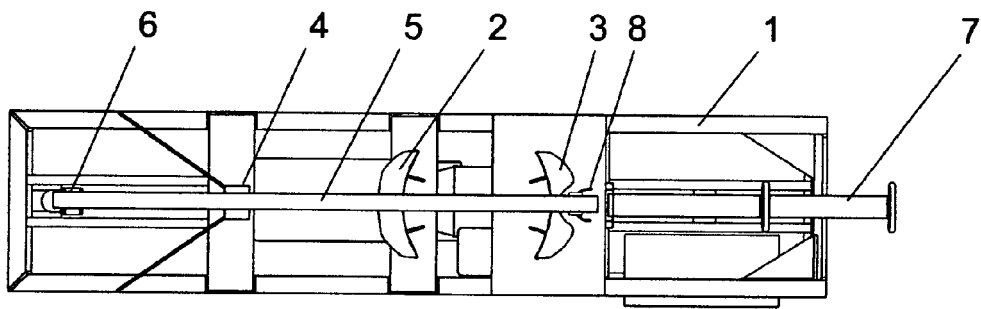


Fig. 3

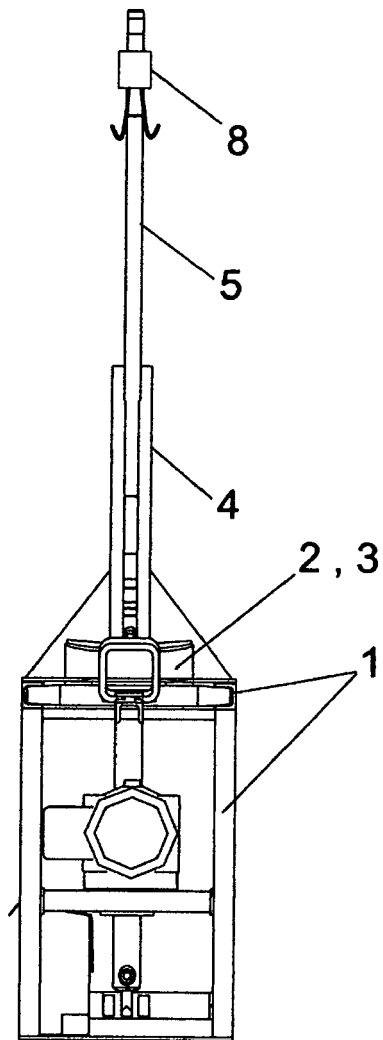


Fig. 4

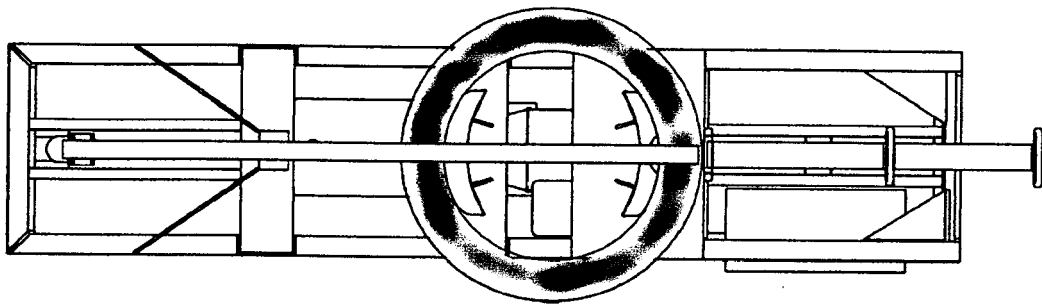


Fig. 5

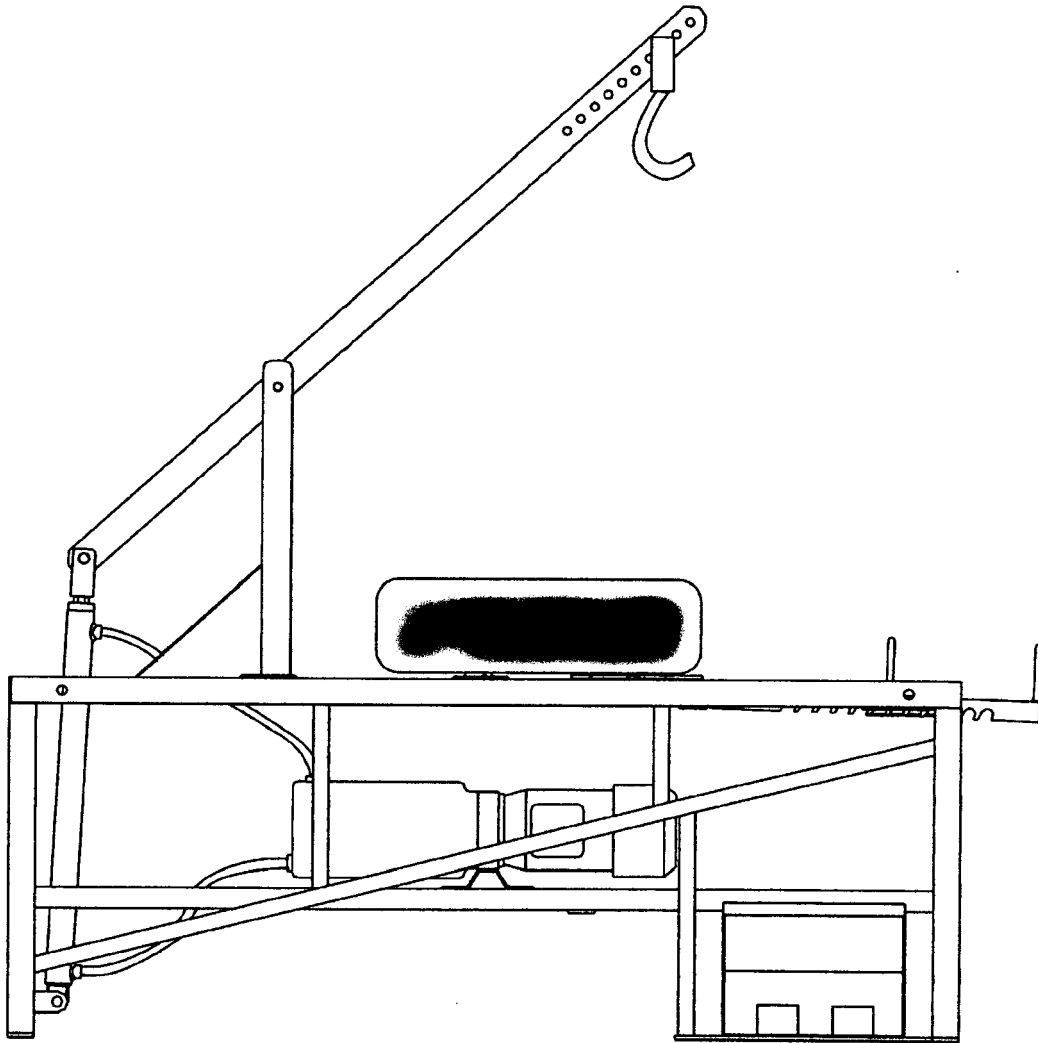


Fig. 6

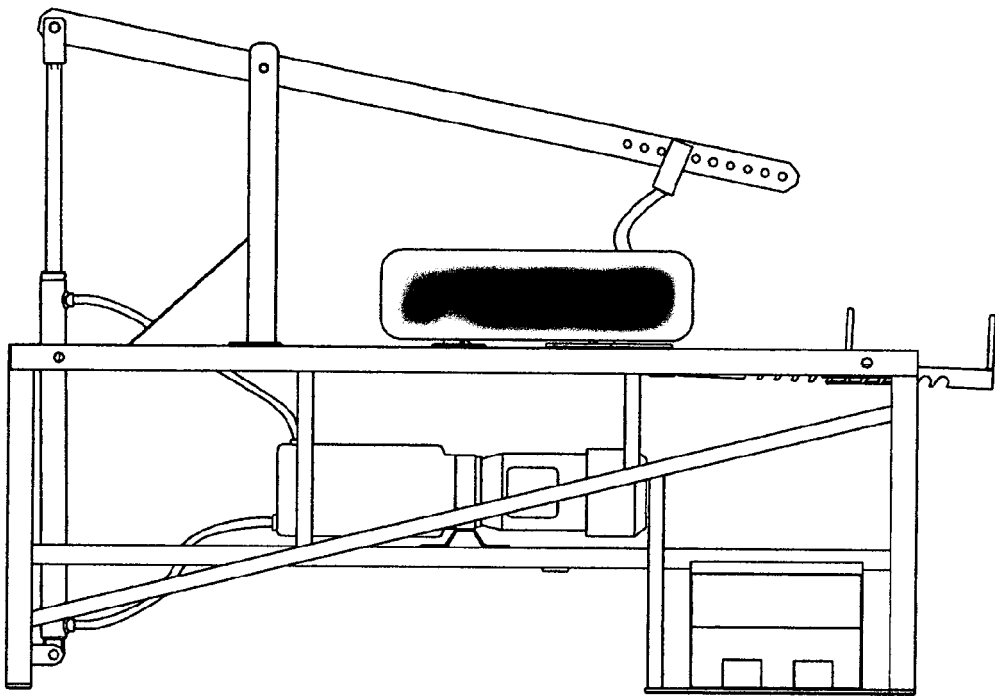


Fig. 7

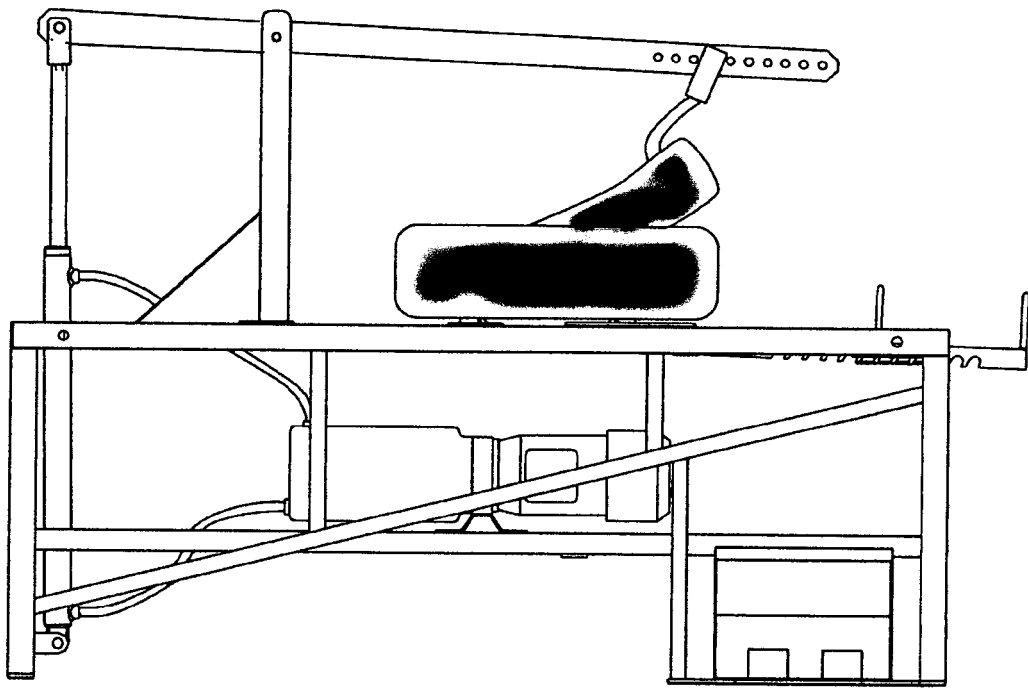


Fig. 8

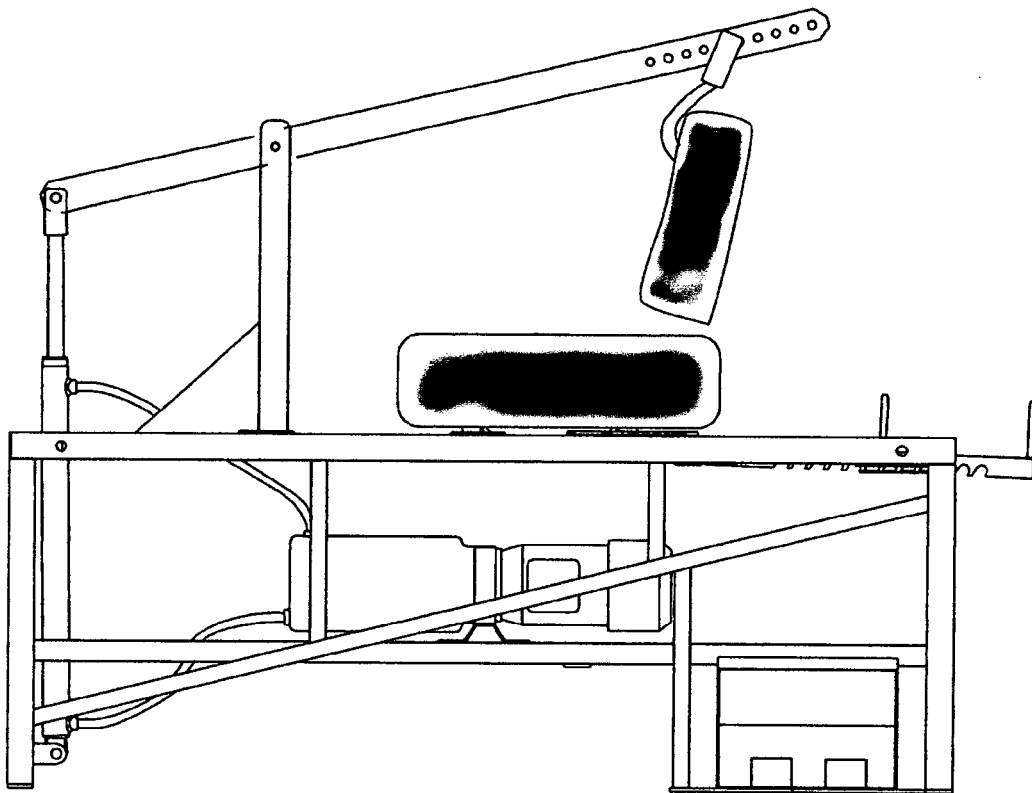


Fig. 9



EUROPEAN SEARCH REPORT

Application Number
EP 11 00 2564

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	EP 0 723 914 A1 (V O F ASSEMBLAGE CT ASCH [NL]) 31 July 1996 (1996-07-31) * the whole document *	1-5	INV. B65B69/00 B65G59/10 B29D30/00
A,D	WO 2009/007796 A1 (LAPIN IVAN [DE]) 15 January 2009 (2009-01-15) * the whole document *	1-5	
A	WO 2008/077046 A2 (ANDROID IND LLC [US]; LAWSON LAWRENCE J [US]; REECE LAWRENCE L [US]; R) 26 June 2008 (2008-06-26) * the whole document *	1-5	
A	EP 1 452 449 A1 (LOEFFLER VERPACKUNGSTECHNIK GM [DE]) 1 September 2004 (2004-09-01)	1-5	
A	US 6 273 670 B1 (HENSON MICHAEL L [US] ET AL) 14 August 2001 (2001-08-14)	1-5	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65B B65G B29D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 August 2011	Examiner Philippon, Daniel
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 00 2564

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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08-08-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0723914	A1	31-07-1996	NL 9500157 A	02-09-1996
WO 2009007796	A1	15-01-2009	AT 477184 T	15-08-2010
			CN 101397059 A	01-04-2009
			DE 202007018801 U1	18-06-2009
			EP 2035282 A1	18-03-2009
			JP 2010540358 A	24-12-2010
			US 2010218459 A1	02-09-2010
WO 2008077046	A2	26-06-2008	US 2008142416 A1	19-06-2008
EP 1452449	A1	01-09-2004	NONE	
US 6273670	B1	14-08-2001	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0723914 A [0002]
- WO 2009007796 A [0002]