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(54) **AUTOMATIC ACCESSORY FOR LIFTING LOADS**

(57) The fixture is intended to be attached to both the lifting machine or device and the load to be lifted, such that it consists of a prism-shaped general frame (1), on one end of which a shaft is mounted horizontally that can be removed (2) on one end of which there is an eyebolt (5) and clevis (6) to be coupled to the relevant lifting ma-

chine, while the other end of said shaft (2) features a triangular cross-piece (7) to be attached to the load. The shaft (2) is rotatable and is automatically driven by electro-pneumatic or electro-hydraulic means, and can be arranged in an open, closed or intermediate position, either manually or remotely.

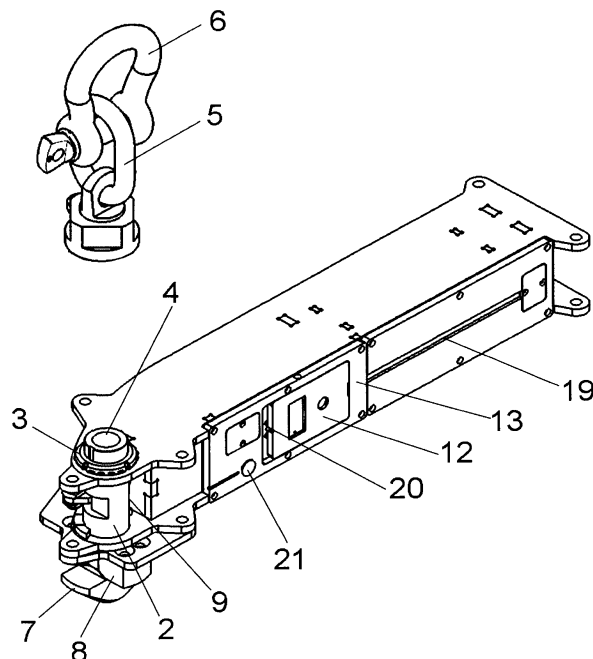


FIG. 1

Description

OBJECT OF THE INVENTION

[0001] The present invention relates to an automatic load-lifting fixture, which has been designed to move loads using a lifting machine or device that is able to support and lift said load.

[0002] The object of the invention is to provide a fixture by means of which the attachment to the corresponding load to be lifted is carried out automatically, including also means for manual actuation or operation.

BACKGROUND OF THE INVENTION

[0003] There are many different means and devices that can attach to a load that has to be lifted using a machine or apparatus that couples to the device so that both the device and therefore, the load, are lifted.

[0004] Although automatic means of operation are known, they are not as reliable as desired, and may even have operational problems, without ruling out a complexity in what is the general structure of the device for attaching and releasing the load, even preventing or not being designed to perform an automatic attachment/release with remote control.

DESCRIPTION OF THE INVENTION

[0005] The proposed device has a range of characteristics that provide numerous benefits and new features, as will be explained below.

[0006] Specifically, the fixture that is the object of this invention consists of a prism-shaped and elongated general frame, on one end of which a shaft is mounted horizontally that can be rotated either manually or automatically by remote control using an electro-pneumatic or electro-hydraulic actuating cylinder, such that one end of said shaft attaches to an eyebolt and a shackle in order to latch onto the lifting machine, while the other end features a type of triangular cross-piece to engage with the load to be lifted.

[0007] The electro-pneumatic and electro-hydraulic means are housed inside the frame casing, as is a rechargeable battery to power all the electrically operated components. The casing also features a lighting system that reveals the position of the shaft, which can be 'open', 'closed' or 'moving'. Depending on the type of light emitted, it is possible to check if the shaft is in any of the above positions and act accordingly in order to avoid any potential accidents.

[0008] The shaft featuring the coupling and releasing means for both the lifting machine and the load can be removed and is attached to an extraction system containing two connecting/additional parts and a support plate.

[0009] Provision has been made for the aforementioned pneumatic or hydraulic cylinder to be housed in-

side the frame casing, the cylinder being attached to the rotating shaft by means of clevis on the cylinder's piston.

[0010] The extraction system has switches so it can be operated manually and means so it can be operated by remote control. It is also possible to drive fixtures of the same nature that are attached to other loads and the entire system can be coupled to the hoisting machine.

[0011] Fixtures constructed as indicated above provide numerous benefits and new features, as summarised below:

- The fixture is equipped with a rechargeable battery, and therefore operates autonomously.
- It has electro-pneumatic or electro-hydraulic functionality and therefore does not need to be connected to external elements such as hydraulic equipment or a power supply.
- The coupling shaft is opened and closed via radio signal and the action to do this by remote control is separate from the action needed to perform this operation manually.
- It features a lighting system where, depending on the type of light emitted, the operator can check if the shaft is closed, open or moving and act as required in order to avoid potential accidents and risks.
- The fixture can be adapted to suit all types of spreaders and separators.
- It can function and be controlled on a unit by unit basis or as a group, with no limit to the number of units that can be used and with no connections. Furthermore, all of this can be done by remote control.
- It can be used in conjunction with any type of tonnage. It can also be installed anywhere and attached to any lifting machine or equipment.
- The fixture is suitable for all types of crates, containers and loads that are ready for coupling and lifting.

DESCRIPTION OF THE DRAWINGS

[0012] In order to expand on the description included below and so as to further explain the characteristics of the invention in accordance with an example of the preferred practical embodiment thereof, a set of figures is enclosed that forms an integral part of said description and illustrates the following by way of a non-limiting example:

Figure 1 shows a perspective view of an automatic fixture to lift loads in accordance with the object of this invention.

Figure 2 shows a longitudinal and lateral view of the fixture without one of its casings so it is possible to see the elements and components housed within it.

Figure 3 shows a front elevation view of the fixture depicted in figure 1.

Figure 4 shows an exploded perspective view of the fixture's shaft with the nut and washer used to affix the same.

Figure 5 shows an exploded perspective view of the extraction system that forms part of the invention fixture.

PREFERRED EMBODIMENT OF THE INVENTION

[0013] The aforementioned figures show that the automatic load-lifting fixture described herein consists of a prism-shaped and elongated general frame (1), on one end of which a shaft is mounted (2) horizontally, with a locknut (3) and a support (4) for an eyebolt (5) to which a shackle is attached (6), this being used to attach to the relevant lifting machine, while at the opposite end, there is a triangular cross-piece (7) to attach the load to be lifted, all the above by means of an extraction system (8) and an internal pneumatic cylinder (9) that attaches to the shaft (2) by means of a clevis and pin (10).

[0014] In addition to the pneumatic cylinder (9), inside the casing (1) there is also an electronic board (11) and a battery system (12), which are set behind a side cover (13). In addition, there is a compressor (14), a pressure switch (15), a pneumatic valve (16) and a solenoid valve (17).

[0015] Furthermore, and as can be seen in figure 2, the fixture includes an electric switch (18) and a lighting system (19) that is connected to the rechargeable battery (20), with manual operating buttons (21).

[0016] Figure 4 shows the shaft (2), the end of which forms an angled cross-piece (7) and the locknut (3) with a washer (3') to effectively mount said shaft (2). There is also a support (22) and two components (23) that have concave sides that face each other and that are a means to extract said shaft, it being possible to attach and remove said components (23) using the screws located on the support (22).

features a triangular cross-piece (7) to be attached to the load. Provision has been made to be able to rotate said shaft and to operate it automatically by electro-pneumatic or electro-hydraulic means and it is possible for the shaft to be in an open, closed or intermediate position. The means to attach the load can be operated manually, or via remote control.

2. Automatic load-lifting fixture, according to claim 1, **characterised in that** the coupling shaft (2) is of an interchangeable nature so it can be attached to the right or left hand side of the general frame.
3. Automatic load-lifting fixture, according to claim 1, **characterised in that** the frame houses a lighting system to give information about the position of the shaft, which may be open, closed or moving.
4. Automatic load-lifting fixture, according to claim 1, **characterised in that** it features manual operating means that use switches to attach the load.
5. Automatic load-lifting fixture, according to claim 1, **characterised in that** it includes a rechargeable battery that electrically powers the different elements involved in operating the fixture.
6. Automatic load-lifting fixture, according to claim 1, **characterised in that** it includes a pneumatic cylinder (9) that is connected to the coupling shaft.
7. Automatic load-lifting fixture, according to claim 1, **characterised in that** it has an extraction system for removing the shaft.

Claims

1. Automatic load-lifting fixture is intended to be coupled to a lifting machine or device and to be attached to the load to be lifted and is **characterised in that** it consists of a prism-shaped general frame (1), on one end of which a shaft is mounted horizontally that can be removed (2) on one end of which there is an eyebolt (5) and shackle (6) to be coupled to the relevant lifting machine, while the other end of said shaft

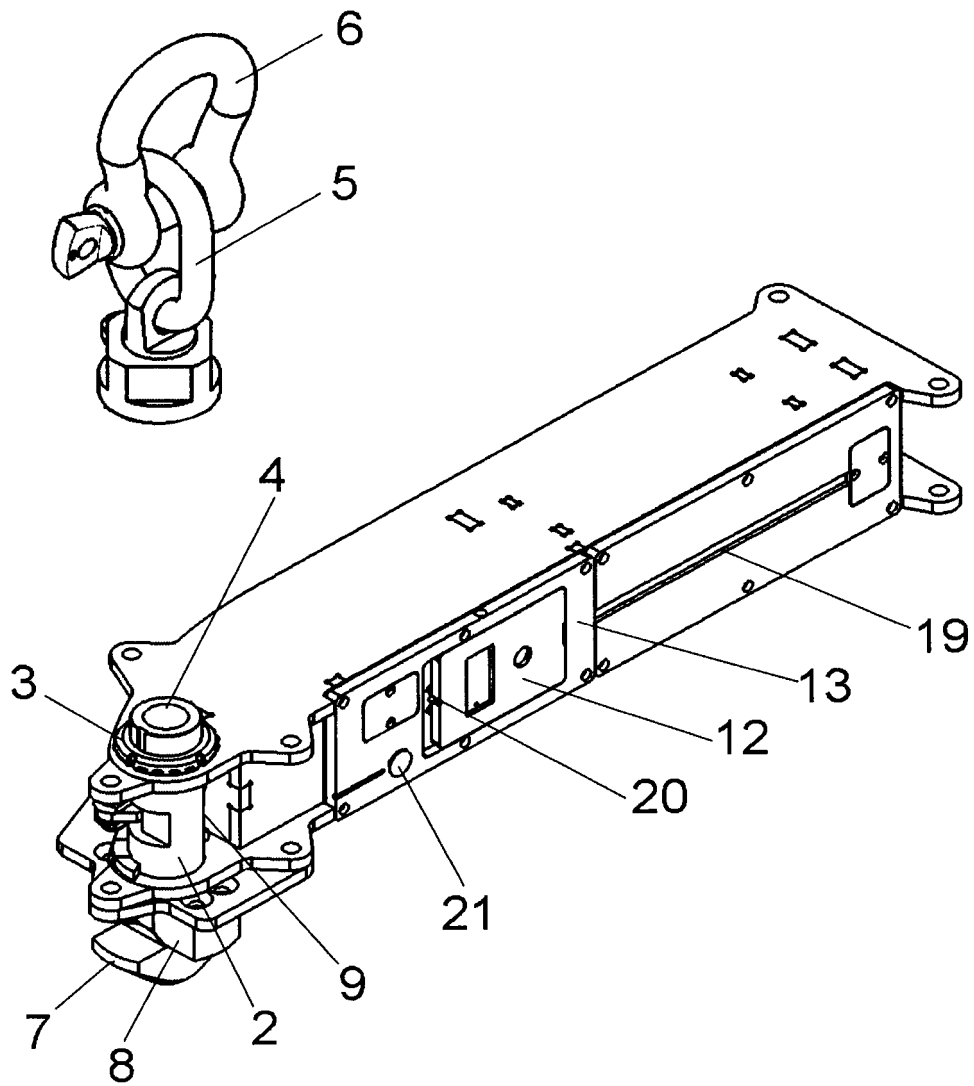


FIG. 1

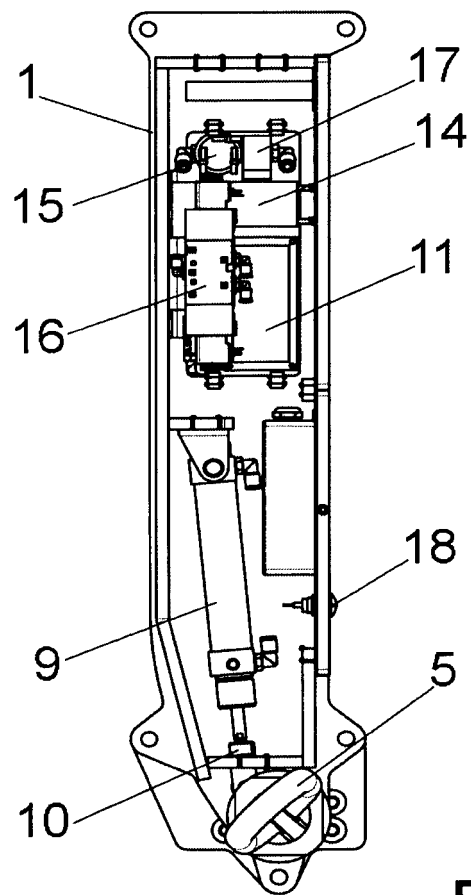


FIG. 2

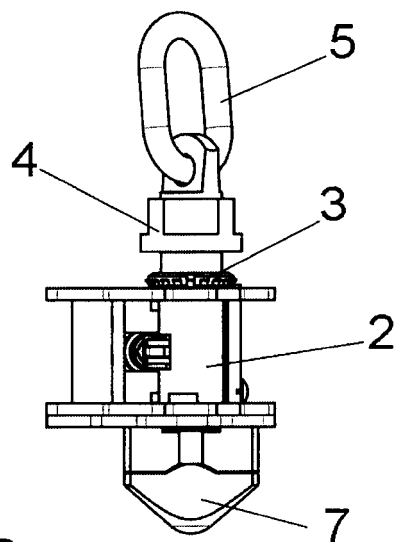


FIG. 3

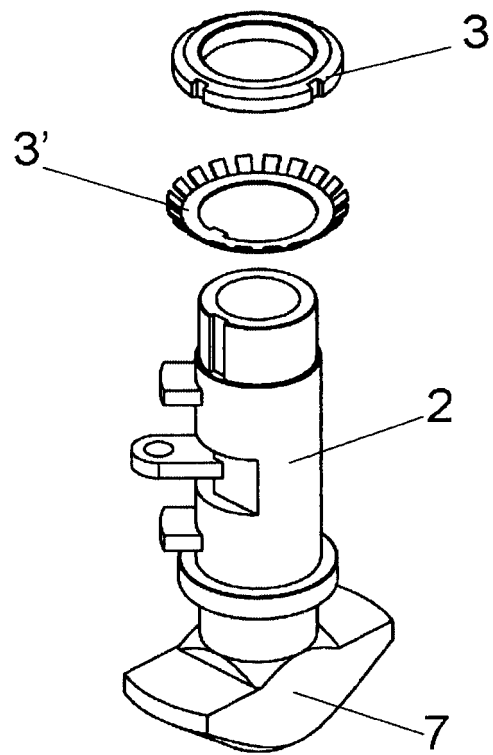


FIG. 4

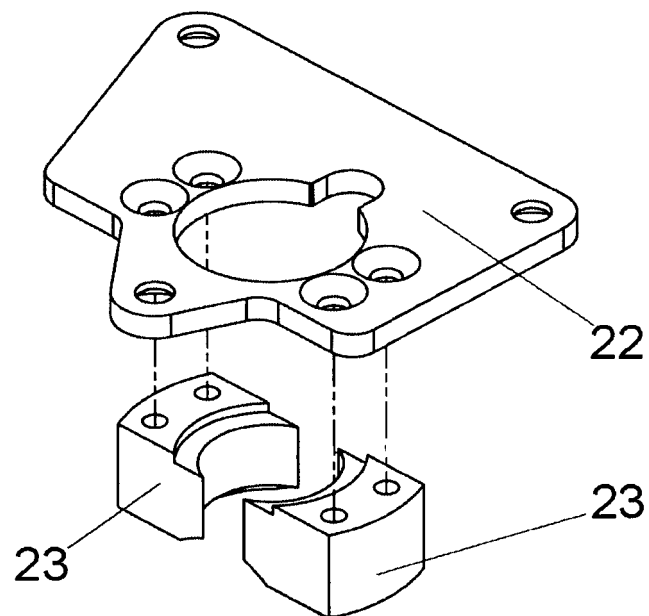


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2016/070387

A. CLASSIFICATION OF SUBJECT MATTER

B66C1/22 (2006.01)**B66C1/34** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B66C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2012080895 A1 (AOKI MITSUO) 05/04/2012, description; figures.	1-7
Y	CN 104176621 A (SINOGREEN POWERSPACE TIANJIN CO LTD) 03/12/2014, Abstract from DataBase WPI. Retrieved from EPOQUE AN-2015-079696. Figures.	1-7
A	JP S5520374U U 08/02/1980, figures.	1-7
A	US 3046046 A (GRIS CONRAD D) 24/07/1962, the whole document.	1-7
A	US 3171552 A (WARRINGTON HENRY G) 02/03/1965, the whole document.	1-7

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed

"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

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search
13/02/2017Date of mailing of the international search report
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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2016/070387

C (continuation).	DOCUMENTS CONSIDERED TO BE RELEVANT	
Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 204508578U U (NANTONG RAINBOW HEAVY MACH CO) 29/07/2015, Abstract from DataBase WPI. Retrieved from EPOQUE AN-2015-563429. Figures.	1-7

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International application No.

PCT/ES2016/070387

Information on patent family members

Information on patent family members			
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