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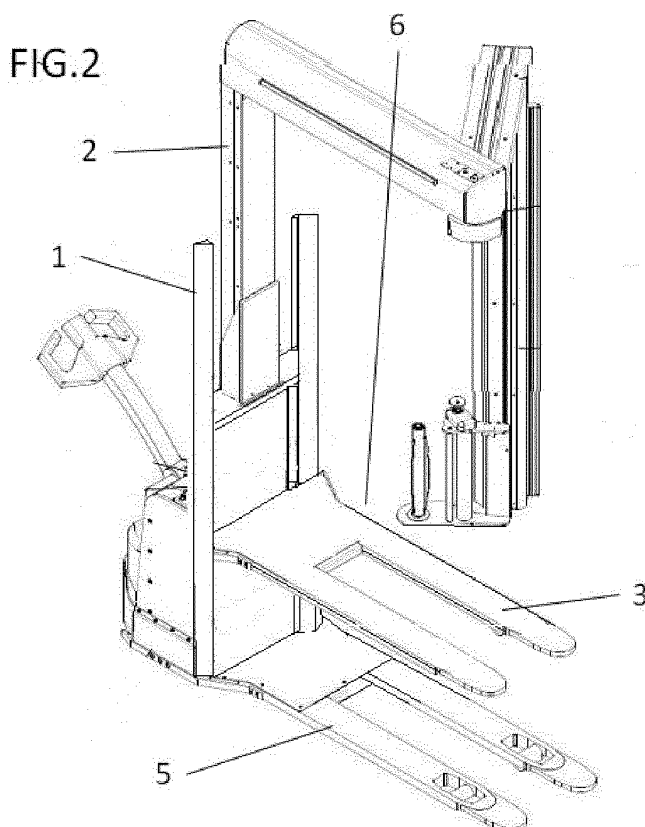
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(54) **TRANSPORTABLE WRAPPER STACKER MACHINE**

(57) Transportable wrapper stacker machine suitable for wrapping loads placed on a pallet and wrapping them to be stacked or deposited at a higher position, such as a load line, a trailer or any other, comprising a base that in turn comprises a support forks (5), a main body (4) and a drive element (7); and further comprising a

hinged structure that comprises a wrapping base (6) comprising a second set of forks, a forklift (1) and a wrapping device (2); wherein the wrapping base (6) with the second set of forks (3) and the wrapping device (2) can be moved upwards and downwards.



Description

[0001] As indicated by its title, the invention relates to a transportable device suitable for wrapping loads placed on a pallet and lifting them to stack or deposit them in a higher place, such as a loading line, a trailer or any other.

[0002] The field of the art corresponding to this invention is that of wrapping and storage machinery.

BACKGROUND

[0003] Current management and logistics requires handling numerous packages which, for efficient handling, must be wrapped jointly in order to be handled in larger units. The use of pallets used as a base on which the packages are stacked is widespread.

[0004] The problem to solve is normally related to retaining the packages on the pallet for transportation and handling thereof.

[0005] Different retaining means are used depending on the type of load. It is common to use straps, normally for large and strong items such as construction elements. However, these straps do not provide protection against rain, for example.

[0006] Another type of retaining wrap is stretch wrap bags which are heat-shrunk after being placed on the load. However, this type of wrap is not useful for non-uniform loads, and obviously cannot be used on loads that can be damaged by heat.

[0007] To overcome these drawbacks other wrapping systems have been developed such as document US 3,867,806, wherein a stack of packages is placed on a turntable, the packages generally being mounted on a pallet such that when the turntable is turned the palletised load of packages is wrapped with a sheet of elastic material such as plastic film. While wrapping the load the sheet is tightened for adjustment to the load and the load is wrapped with as many layers as needed to obtained the desired strength.

[0008] Document US 4,067,174 also uses an elastic material sheet that improves on the aforementioned document by incorporating a drive unit carrying the reel of sheet and the guided stretching unit around the material to wrap, which in this case is stationary.

[0009] This system has been improved by subsequent documents, such as US 4,095,395 which incorporates a self-guiding system for the spool carriage.

[0010] The applicant holds EP2147864 relating to a wrapping machine of the type comprising a revolving arm and a spool carriage that orbits around and wraps the load, which is stationary.

[0011] The applicant also holds EP10005504 relating to a structure for joining a functional element, such as a wrapping arm, to a forklift truck such that the load does not have to be transported to the wrapping place, instead transporting the wrapper to the location of the load or using load transit points for wrapping.

[0012] Document US 4,282,700 relates to a wrapping

device mounted on a pallet carrier where the wrapping element is joined to the vehicle chassis and is inclined with respect to the ground to avoid compromising the centre of gravity of the assembly, particularly while lifting the load, despite the use of a heavy vehicle such as a pallet carrier, which makes its use as a stacker complex.

DESCRIPTION OF THE INVENTION

[0013] To solve the drawbacks described above a machine is disclosed that performs the functions of stacker, forklift truck and wrapper, with a small perimeter and high manoeuvrability.

[0014] This allows overcoming the drawbacks of forklift trucks, the forks of which cannot be raised for than is strictly necessary to prevent contact of the load against the ground, and thus cannot be used to stack the loads, while also overcoming the drawbacks of stackers, increasing the usefulness thereof.

[0015] The transportable wrapper stacker machine comprises:

1. A base, which in turn includes:

- a. A first set of forks referred to as the support forks.
- b. A main body including the drive element.

2. A hinged structure comprising:

- a. A wrapping base comprising a second set of forks.
- b. A forklift joined to the wrapping base.
- c. A wrapping device joined to the forklift.

[0016] The support forks are integrally attached to the main body forming the base of the machine.

[0017] These support forks can incorporate means for lifting slightly in order to separate the load from the floor to prevent friction and allow transport. This is a minimal lift (20 to 30 centimetres) such that it is not useful for stacking purposes.

[0018] Said base also comprises the drive element, which includes the motor, the power supply, normally batteries, the drive wheels, the auxiliary wheels, the steering means, preferably the controls and other elements for controlling and powering the machine.

[0019] The hinged structure also comprises a second set of forks which, in the bottom or resting position thereof, covers the support forks as the upper shape of the support forks is suitable for being housed in the lower shape of the second set of forks.

[0020] The wrapping base comprising the second set of forks, the forklift and the wrapping machine form part of the hinged structure of the machine.

[0021] The wrapping base, the second set of forks and the wrapping device share a vertical movement produced by the forklift to whose moving element they are attached.

[0022] The forklift is attached to the base by conventional attachment means.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] FIGURE 1 shows the transportable wrapper stacker machine in a position where the second set of forks is at its lowest position, that is, covering the support forks, where the following can be seen:

1. The forklift (1)
2. The wrapping device (2)
3. The wrapping base (6) with the second set of forks (3) which in this case cover the support forks.
4. The main body (4)
5. The steering and control elements of the machine (8)

[0024] FIGURE 2 shows the transportable wrapper stacker machine in a position in which both the wrapping device (2) and the wrapping base (6) with the second set of forks (3) are lifted by the forklift (1), revealing the support forks (5).

DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

[0025] An embodiment of the invention is described below for purposes of illustration only and in a non-limiting sense.

[0026] The wrapper stacker machine comprises a base and a hinged structure.

[0027] The base comprises support forks (5) and the main body (4) housing, among other elements, the batteries, motor, steering, power outlets and controls of the machine.

[0028] This base uses as a support an electric stacker in which minor changes have been made to promote the unions between the base and the hinged structure, and the electrical communications have been provided to power and control the forklift and the wrapping device.

[0029] The forklift controls are located on the main body (4) and the wrapping device controls are located on the forklift. In other embodiments of the invention the controls can be located elsewhere without their location affecting the essence of the invention.

[0030] The hinged structure is attached to the base by conventional attachment elements.

[0031] The hinged structure comprises a forklift (1) attached to the base that lifts and lowers together with it the wrapping base (6) with the second set of forks (3) and a wrapping device (2).

[0032] The wrapping device is of the type comprising a vertical column and an upper horizontal bar, forming an inverted L shape with a shaft at the end about which revolves a horizontal arm joined at its end to a vertical arm, forming an inverted L shape smaller than the aforementioned one, where said vertical arm incorporates the

spool carriage, such that the load remains still at an optimum position while the revolving arm orbits the load and wraps it.

[0033] The load to wrap rests on the wrapping base (6), mainly on the second set of forks (3), and is centred by the introduction of the support forks (5) and the second set of forks (3), now joined, in the orifices of the pallet.

[0034] If the load is raised, the wrapping base (6) and the second set of forks (3) are separated from the support forks (5), leaving the load on the wrapping base and the second set of forks, while the support forks contribute to the stability of the assembly.

[0035] The wrapping base (6) and the second set of forks (3) and the wrapping device (2) are lifted and lowered together, maintaining a constant separation between the wrapping base (6) and the horizontal upper arm of the wrapping device (2) such that the height of the wrapping field, understood as the space needed for the wrapping operations, remains constant even if the load is lifted by the forklift.

[0036] The second set of forks (3) at its lowest position is covered and rests on the support forks (5), thereby allowing insertion thereof in the orifices of a pallet for handling.

[0037] The movement of the second set of forks takes place along the vertical line of the support forks.

Claims

1. TRANSPORTABLE WRAPPER STACKER MACHINE, **characterised in that** it comprises:

1. A base comprising:

- a. Support forks (5)
- b. A main body (4)
- c. A drive element (7).

2. A hinged structure comprising:

- a. A wrapping base (6) comprising a second set of forks (3)
- b. A forklift (1)
- c. A wrapping device (2)

wherein the wrapping base (6) with the second set of forks (3) and the wrapping device (2) have an upward and downward movement.

2. TRANSPORTABLE WRAPPER STACKER MACHINE according to the preceding claim, **characterised in that** the second set of forks (3) and the wrapping device (2) are lifted and lowered together.

3. TRANSPORTABLE WRAPPER STACKER MACHINE according to claim 1, **characterised in that** the upper shape of the support forks (5) allows the

insertion thereof in the lower shape of the second set of forks (3).

4. TRANSPORTABLE WRAPPER STACKER MACHINE according to claim 1, **characterised in that** the wrapping device comprises a vertical column with a horizontal arm on the top thereof forming an "L", joined to another arm with a smaller inverted "L" shape, wherein said second arm revolves about a shaft placed on the end of the horizontal segment thereof.
5. TRANSPORTABLE WRAPPER STACKER MACHINE according to claim 1, **characterised in that** the drive element comprises the motor, the drive wheels, the power supply and the steering elements (8).

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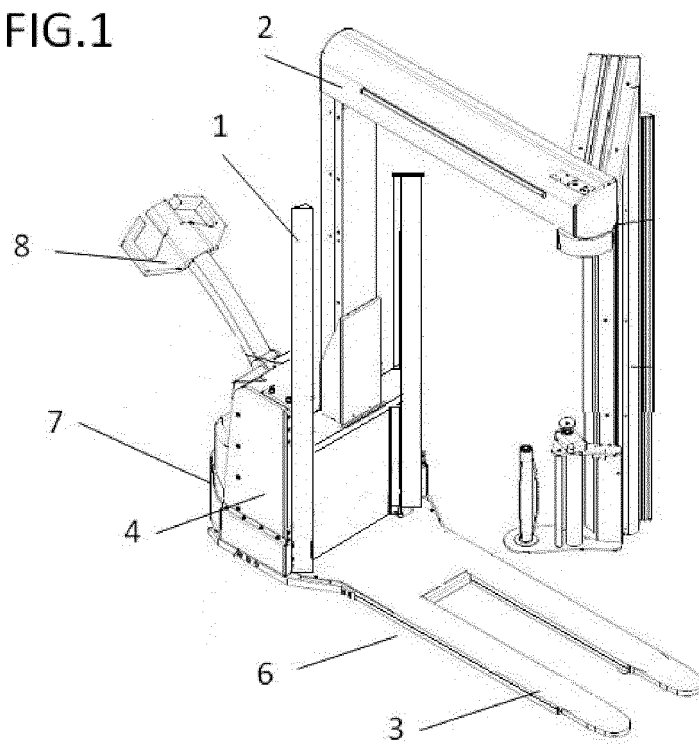
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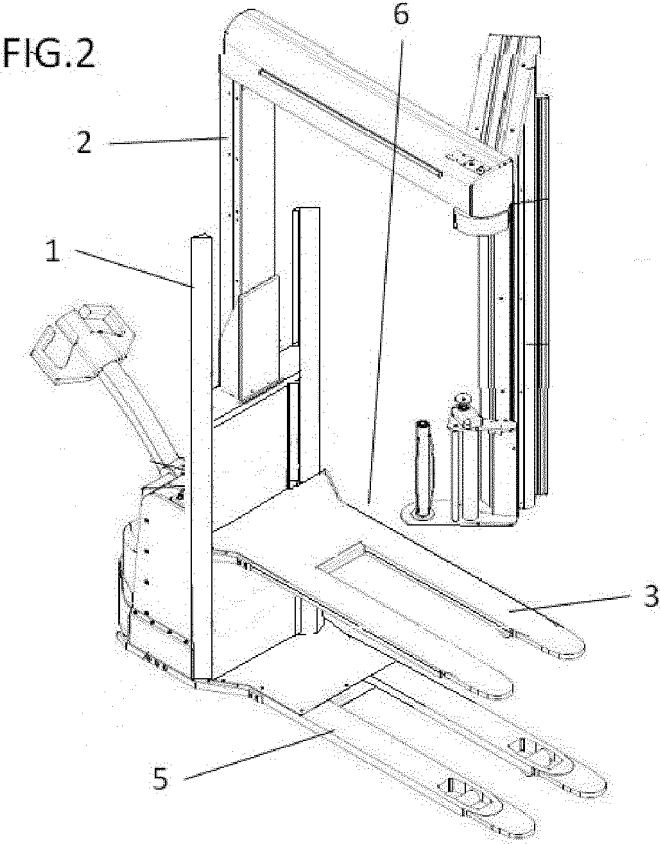
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FIG.1







EUROPEAN SEARCH REPORT

Application Number
EP 16 16 2677

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 August 2016	Examiner Sheppard, Bruce
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 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 16 16 2677

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The members are as contained in the European Patent Office EDP file on
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