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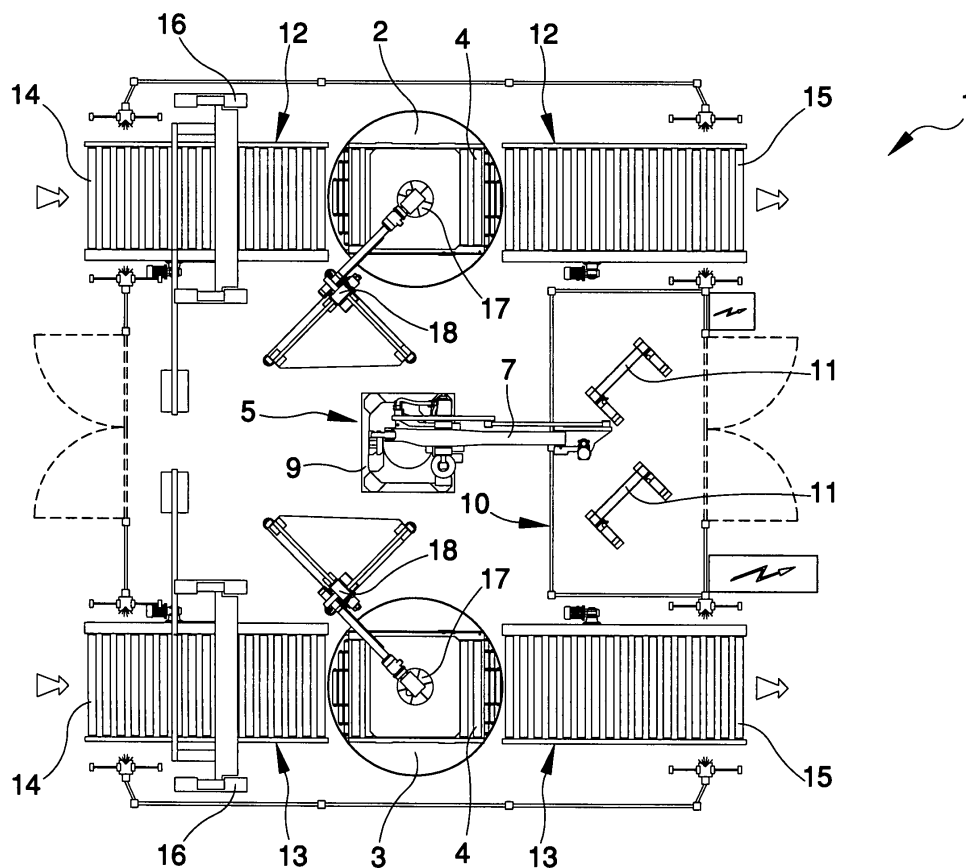
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(54) **Method and plant for wrapping palletised loads**

(57) The method for wrapping palletised loads comprises the following phases: arranging a first and second swivel platforms to receive a palletised load and a covering film reel moving machine to work together with both swivel platforms; depositing one palletised load at a time on said first swivel platform; depositing one palletised

load at a time on said second swivel platform; wrapping, alternately, a palletised load deposited on the first swivel platform and one on the second swivel platform by means of the co-ordinated movement of the reel of film, carried by the moving machine, and the rotation of the palletised load placed on the swivel platform; moving said palletised load away from the first and second swivel platforms.

Fig. 1



Description

[0001] The present invention refers to a method and the relative plant for wrapping palletised loads.

[0002] As is common knowledge, palletised loads are generally covered with a stabilising wrapping that immobilises the loads on pallet, leaving said wrapping on for transporting as it guarantees against the risk of falling or tipping over.

[0003] To make this stabilising wrapping, it is normal practice to tightly wrap the sides of the load and the pallet with a plastic covering film, unwound from a reel.

[0004] Wrapping is generally carried out using automatic or semi-automatic plants.

[0005] A widely used wrapping plant is the one with a covering film reel moving machine and a swivel platform on which the palletised load is deposited for wrapping.

[0006] The moving machine moves the reel of film in a vertical direction while simultaneously wrapping the covering film on the palletised load as it turns on the swivel platform.

[0007] As a rule, the swivel platform and reel moving machine are part of an automatic conveyance line which sees to depositing the palletised loads one after the other on the swivel platform and moving them away from it once wrapped.

[0008] More specifically, said conveyance line comprises transport means for placing the palletised loads on the swivel platform and accessory devices for preparing each palletised load for wrapping.

[0009] For example, the conveyance line generally comprises means for applying a covering element on each palletised load, usually a sheet of plastic, and other means for pressing said covering element on the palletised load as it is turning on the swivel platform.

[0010] These known plants do have some drawbacks though, among which the fact that their production capacity is greatly limited by long down times when no palletised load is being wrapped.

[0011] This fact is due mostly to the time it takes to place the palletised loads on the swivel platform.

[0012] As a matter of fact, moving palletised loads that are not yet stabilised is a difficult job and must be done at rather slow speeds and accelerations if there is to be no falling or tipping over.

[0013] Another setback concerning said down times is the time needed for the accessory devices to get the palletised loads ready for the preparatory operations.

[0014] Altogether, it is possible to estimate that about 20%-30% of the total process time is taken up by said transport and preparation activities during which the covering film reel moving machine and the swivel platform are substantially at a standstill.

[0015] The main aim of this invention is to find a method and a plant for wrapping palletised loads that will get around the above mentioned drawbacks with a simple, rational and cost-effective solution.

[0016] This aim is achieved by the present method for

wrapping palletised loads, characterized by the fact that it comprises the following phases:

- arranging a first and a second swivel platforms adapted to receive a palletised load and a covering film reel moving machine to work together with said first and second swivel platforms;
- depositing one palletised load at a time on said first swivel platform;
- depositing one palletised load at a time on said second swivel platform;
- wrapping, alternately, a palletised load deposited on the first swivel platform and a palletised load on the second swivel platform by means of the co-ordinated movement of the reel, carried by the moving machine, and the rotation of the palletised load placed on the swivel platform;
- moving said palletised load away from the first and second swivel platforms.

[0017] The same aim is also achieved by the current plant for wrapping palletised loads, characterised by the fact that it comprises at least one first swivel platform to receive a palletised load and to make it turn around a vertical rotational axis, a second swivel platform to receive a palletised load and to make it turn around a vertical rotational axis, and a covering film reel moving machine to wrap with said covering film a palletised load that is turning either on said first swivel platform or on said second swivel platform, said moving machine being designed to work, alternately, a palletised load deposited on the first swivel platform and a palletised load deposited on the second swivel platform.

[0018] Further characteristics and advantages of this invention will appear even more evident when reading the following description, given purely as an example and not limited, with the aid of the figures illustrated in the enclosed tables, wherein:

- figure 1 is a plan view of the plant according to the invention;
- figure 2 is an elevated side view, schematic and partial, of a portion of the plant according to the invention.

[0019] With particular reference to such figures, a plant for wrapping palletised loads, comprising a first swivel platform 2 and a second swivel platform 3 has been generally designated by reference numeral 1.

[0020] Each swivel platform 2 and 3 is for holding a palletised load C to wrap, and is designed to turn it around a substantially vertical rotational axis.

[0021] In particular, each swivel platform 2 and 3 features a top standing surface, substantially flat, to hold the palletised load C.

[0022] In the form of embodiment of this invention illustrated in the figures, the standing surface consists of a motorised roller conveyor 4 along which the palletised

load C moves forward until it reaches a substantially central position on the relative swivel platform 2 and 3.

[0023] A moving machine 5 for a reel 6 of a covering film 6a is positioned between the first swivel platform 2 and the second swivel platform 3.

[0024] The moving machine 5 is designed to work with both swivel platforms 2 and 3 to move the reel 6 vertically so the covering film 6a can be wrapped on the palletised loads C as they are turning on the swivel platforms 2 and 3.

[0025] In detail, the moving machine 5 is able to work alternately on a palletised load C already deposited on the first swivel platform 2 and on another palletised load C already deposited on the second swivel platform 3.

[0026] In the form of embodiment illustrated in the figures, the moving machine 5 comprises a jointed arm 7 featuring a working head 8 on its free end that supports the reel 6.

[0027] The jointed arm 7 is hinged to a fixed base 9 on a vertical axis so it can rotate around said axis to bring the reel 6 close to the first swivel platform 2 or, alternately, to the second swivel platform 3.

[0028] In particular, the moving machine 5 is of the automatic working head 8 changeable type.

[0029] For this reason, the plant 1 comprises a deposit magazine 10 for the interchangeable working heads 8 located where it can be accessed by the jointed arm 7 of the moving machine 5.

[0030] The deposit magazine 10 is equipped with a set of supporting structures 11 for housing the working heads 8.

[0031] In actual fact, when the reel 6 is finished, the moving machine 5 automatically releases the working head 8 onto an empty supporting structure 11 and collects a new working head 8 from the deposit magazine 10 that has a reel 6 ready to use.

[0032] This changing-over operation normally only takes about twenty seconds.

[0033] The moving machine 5 is of the known type and therefore will not be described further herein.

[0034] It can quite effectively be substituted with any other known machine that is used to move a reel 6 provided that such a machine can be made to work alternately with both swivel platforms 2 and 3.

[0035] As illustrated in figure 1, the swivel platforms 2 and 3 are served by a first automatic conveyance line 12 and by a second automatic conveyance line 13 respectively.

[0036] Each conveyance line, 12 and 13, is designed to automatically place a palletised load C for wrapping on the relative swivel platform 2 and 3, and to move the wrapped palletised load C away.

[0037] Please note that out of the operations required to place the palletised load C on the swivel platform 2 and 3, the preparatory operations that make said palletised load C suitable for wrapping are also included, as explained below.

[0038] Each conveyance line 12 and 13 features trans-

fer means that move a palletised load C towards the relative swivel platform 2 and 3, place it on the platform and later move it away from the platform.

[0039] For each conveyance line 12 and 13, such transfer means consist of a motorised inlet roller conveyor 14 positioned upstream of the corresponding swivel platform 2 and 3, a motorised roller conveyor 4 on the actual platform and a motorised outlet roller conveyor 15 positioned downstream of the swivel platform 2 and 3.

[0040] By the motorised inlet roller conveyors 14, both the first and second conveyance lines 12 and 13 feature the applicator means 16 that place a covering element E, such as a sheet of cardboard or the like, on each palletised load C in preparation for wrapping.

[0041] In addition, near the swivel platforms 2 and 3, the conveyance lines 12 and 13 are equipped with their own pressing devices 17 that lower to press the palletised load C which is on the first swivel platform 2 or, respectively, on the second swivel platform 3, the purpose being to keep it stable while wrapping.

[0042] In detail, the pressing devices 17 are mounted on corresponding supporting columns 18 and slide vertically so they come into contact with the covering element E placed on top of the palletised load C.

[0043] Usefully, the plant 1 features a control and operating system, not illustrated in detail in the figures, that co-ordinates the operation of the moving machine 5, of the conveyance lines 12 and 13 and of the pressing devices 17.

[0044] This control and operating system works in such a way that while the moving machine 5 is working on a palletised load C deposited on the first swivel platform 2, the second conveyance line 13 moves a previously wrapped palletised load C away from the second swivel platform 3 and places a new palletised load C on it to be wrapped and on which a pressing device 17 lowers, and vice versa.

[0045] The operation of plant 1 comprises, first of all, the phases allowing to deposit one palletised load C at a time on the first and second swivel platform 2 and 3 respectively. Such phases consist of moving the palletised loads C along the motorised inlet roller conveyors 14, applying the covering elements E on the palletised loads C through the applicator means 16, placing the palletised loads C on the swivel platforms 2 and 3 and then pressing the covering elements E on the palletised loads C through the lowering of the pressing devices 17.

[0046] The palletised loads C placed on the platforms 2 and 3 are then wrapped alternately by means of the co-ordinated movement of the reel 6, carried by the moving machine 5, and the rotation of the palletised load C placed on the swivel platforms 2 and 3.

[0047] Once each palletised load C is wrapped, it is moved away from the relative swivel platform 2 and 3.

[0048] Advantageously, while a palletised load C placed on the first swivel platform 2 is being wrapped, a previously wrapped palletised load C is moved away from the second swivel platform 3 and a new palletised load

C is deposited in its place, ready for wrapping, and vice versa.

[0049] In practice it has been found that the described invention achieves the intended purposes and more specifically emphasis is placed on the fact that it ensures a huge reduction of down times of the reel moving machine, thus having a faster and more efficient wrapping plant with a much higher production capacity than the known plants.

[0050] The invention thus conceived is susceptible of numerous modifications and variations, all of which falling within the scope of the inventive concept.

[0051] Furthermore all the details can be replaced with others that are technically equivalent.

[0052] In practice, the materials used, as well as the shapes and dimensions, may be any according to requirements without because of this moving outside the protection scope of the following claims.

Claims

1. Method for wrapping palletised loads, **characterized by** the fact that it comprises the following phases:

- arranging a first and a second swivel platforms adapted to receive a palletised load and a covering film reel moving machine to work together with said first and second swivel platforms;
- depositing one palletised load at a time on said first swivel platform;
- depositing one palletised load at a time on said second swivel platform;
- wrapping, alternately, a palletised load deposited on the first swivel platform and a palletised load on the second swivel platform by means of the co-ordinated movement of the reel, carried by the moving machine, and the rotation of the palletised load placed on the swivel platform;
- moving said palletised load away from the first and second swivel platforms.

2. Method according to claim 1, **characterized by** the fact that while a palletised load deposited on the first swivel platform is being wrapped, a previously wrapped palletised load is moved away from the second swivel platform and/or a new palletised load is deposited in its place, ready for wrapping, and vice versa.

3. Method according to claim 1, **characterized by** the fact that at least one of said phases of depositing a palletised load on said first and second swivel platforms comprises a phase of moving said palletised load towards the relative swivel platform and placing it on the platform.

4. Method according to claim 3, **characterized by** the fact that at least one of said phases of depositing a palletised load on said first and second swivel platforms comprises a phase of applying a covering element on said palletised load.

5. Method according to claim 4, **characterized by** the fact that said phase of applying a covering element on the palletised load comes before placing the same on the relative first or second swivel platform.

6. Method according to claim 1, **characterized by** the fact that at least one of said phases of depositing a palletised load on said first and second swivel platforms comprises a phase of pressing said palletised load against the corresponding platform.

7. Method according to claim 6, **characterized by** the fact that said phase of pressing said palletised load is obtained by lowering a pressing device.

8. Method according to claim 6, **characterized by** the fact that said phase of pressing said palletised load comes after applying a covering element on the load itself.

9. Plant for wrapping palletised loads, **characterized by** the fact that it comprises at least one first swivel platform adapted to receive a palletised load and to make it turn around a vertical rotational axis, a second swivel platform adapted to receive a palletised load and to make it turn around a vertical rotational axis, and a covering film reel moving machine adapted to wrap with said covering film a palletised load that is turning either on said first swivel platform or on said second swivel platform, said moving machine being adapted to work, alternately, a palletised load deposited on the first swivel platform and a palletised load deposited on the second swivel platform.

10. Plant according to claim 9, **characterized by** the fact that it comprises at least one first automatic conveyance line to deposit one palletised load at a time on said first swivel platform and later to move it away from said platform.

11. Plant according to claim 9, **characterized by** the fact that it comprises at least one second automatic conveyance line to deposit one palletised load at a time on said second swivel platform and then to move it away.

12. Plant according to claim 9, **characterized by** the fact that it comprises a control and operating system that co-ordinates the operation of said moving machine and said first and second conveyance lines, in such a way that while the moving machine is working on a palletised load deposited on the first swivel plat-

form, the second conveyance line moves a previously wrapped palletised load away from the second swivel platform and/or places a new palletised load on it to be wrapped, and vice versa.

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13. Plant according to one or more of claims 10 and 11, **characterized by** the fact that at least one of said first and second conveyance lines comprises transfer means that move a palletised load towards the relative swivel platform, place it on the platform and later move it away from the platform. 10
14. Plant according to claim 13, **characterized by** the fact that said transfer means comprise at least one roller conveyor on which the palletised loads are deposited. 15
15. Plant according to claim 14, **characterized by** the fact that a section of said roller conveyor is positioned on at least one of said first and second swivel platforms. 20
16. Plant according to one or more of claims 10 and 11, **characterized by** the fact that at least one of said first and second conveyance lines comprises applicator means which apply a covering element on each palletised load to be wrapped. 25
17. Plant according to claim 16, **characterized by** the fact that at least one of said first and second conveyance lines comprises at least one pressing device which lowers to press said covering element on a palletised load positioned on the relative swivel platform. 30
18. Plant according to claim 17, **characterized by** the fact that said first and second conveyance lines comprise respective pressing devices which lowers to press said covering element on a palletised load positioned on the first and second swivel platforms respectively. 35 40
19. Plant according to claim 18, **characterized by** the fact that it comprises a control and operating system that co-ordinates the operation of said moving machine, said first and second conveyance lines and said pressing devices, in such a way that while the moving machine is working on a palletised load deposited on the first swivel platform, a pressing device lowers on a palletised load deposited on the second swivel platform, and vice versa. 45 50

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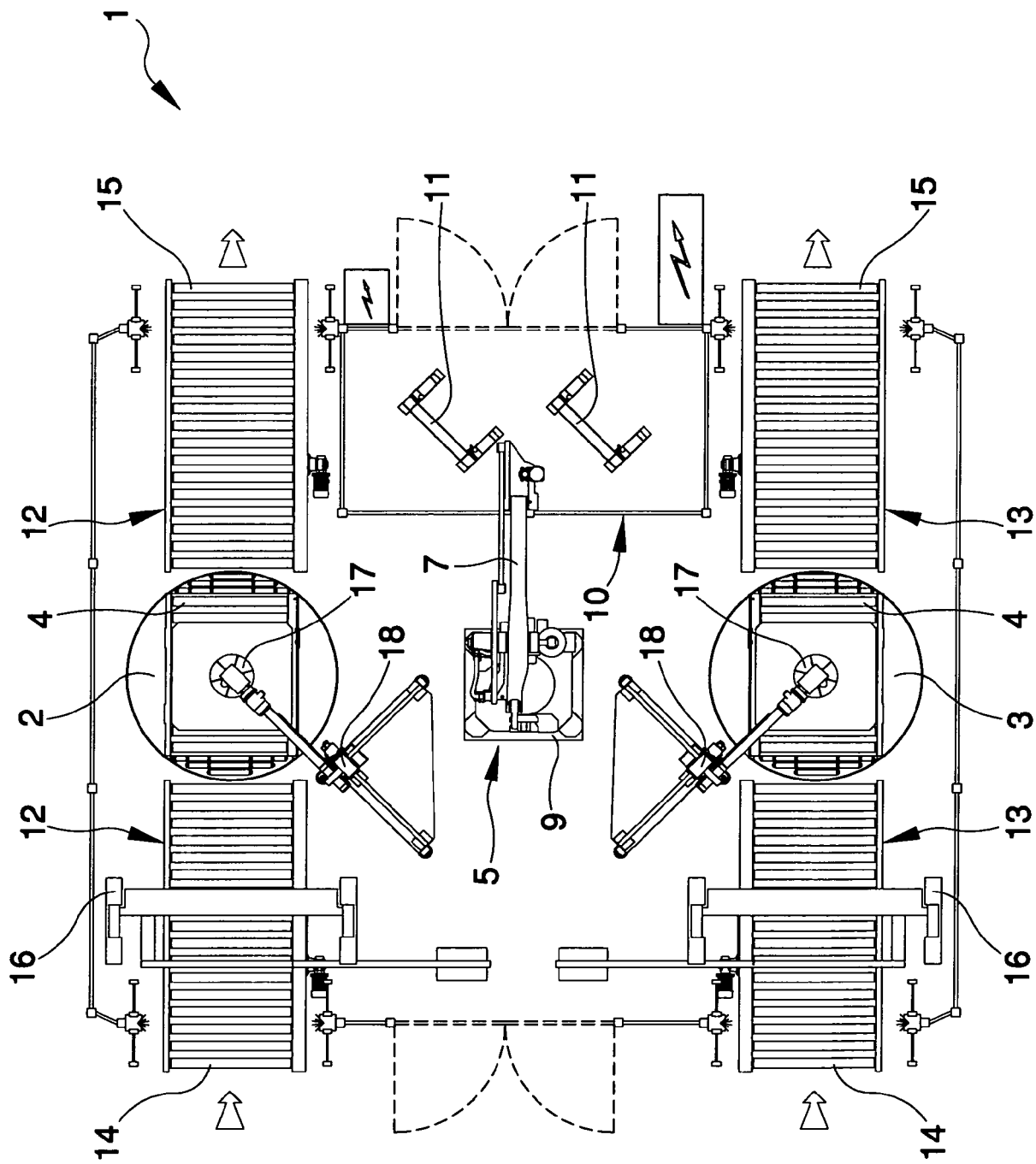


Fig. 1

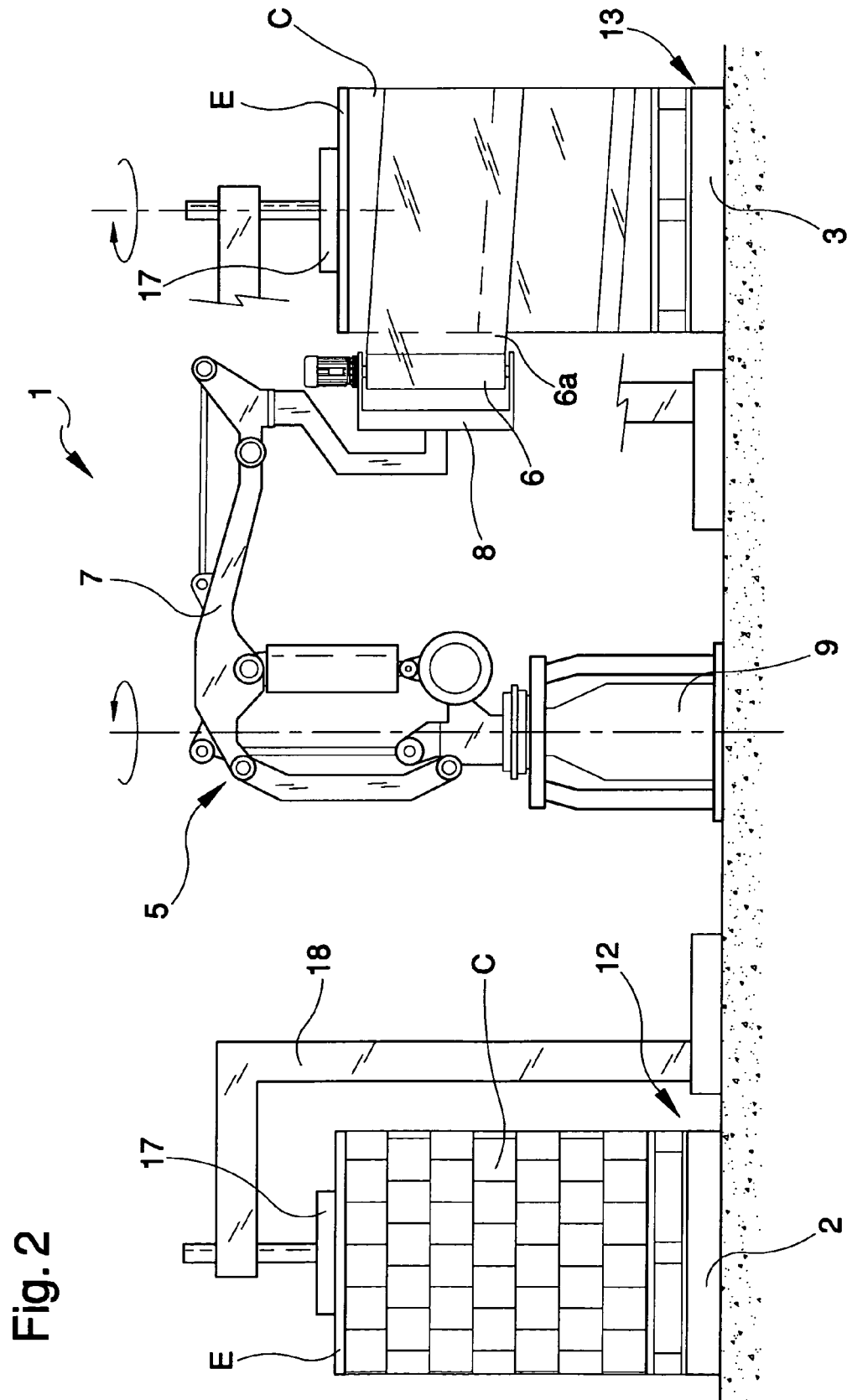


Fig. 2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5343

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	US 4 409 777 A (WHITE KENNETH D [US] ET AL) 18 October 1983 (1983-10-18) * figure 1 * * column 3, line 11 - line 35 * -----	1-19	INV. B65B11/04
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			TECHNICAL FIELDS SEARCHED (IPC)
			B65B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 19 October 2006	Examiner Damiani, Alberto
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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EPO FORM 1503 03/82 (P04C01)

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

EP 06 42 5343

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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19-10-2006

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