

(19)



(11)

EP 2 150 465 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
02.03.2011 Bulletin 2011/09

(21) Application number: **08737364.3**

(22) Date of filing: **31.03.2008**

(51) Int Cl.:
B65B 11/04 (2006.01)

(86) International application number:
PCT/IB2008/000765

(87) International publication number:
WO 2008/132566 (06.11.2008 Gazette 2008/45)

(54) PROCESS AND SYSTEM FOR WRAPPING PALLETISED LOADS

VERFAHREN UND SYSTEM ZUM EINWICKELN VON PALETTIERTEN LASTEN

PROCÉDÉ ET SYSTÈME POUR EMBALLER DES CHARGES PALETTISÉES

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**

(30) Priority: **27.04.2007 IT MO20070145**

(43) Date of publication of application:
10.02.2010 Bulletin 2010/06

(73) Proprietor: **Bema - S.r.l.
42030 Viano (RE) (IT)**

(72) Inventor: **MURAROTTO, Emilio
31033 Castelfranco Veneto (TV) (IT)**

(74) Representative: **Brogi, Graziano
APTA S.r.L.
Consulenti in Proprietà Industriale
Via Giardini 625
41125 Modena (IT)**

(56) References cited:
FR-A- 2 622 866 US-A- 4 955 181

EP 2 150 465 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

Technical Field

[0001] This invention refers to a process and a system for wrapping palletised loads.

Background Art

[0002] As is common knowledge, the palletised loads consist of one or more goods distributed in a more or less orderly manner on a pallet so it can be moved and transported in a practical and easy way.

[0003] The palletised loads are normally covered with a stabilising wrap that immobilises the loads on the pallet so they can then be transported without any risk of falling or tipping over.

[0004] To make such a stabilising covering the usual way is to tightly wrap the sides of the load and pallet with a plastic covering film that is unwound from a dispensing reel.

[0005] Wrapping is normally done by means of either automatic or semi automatic wrapping stations, which use one or more machines, intended to move a wrapping head which supports the reel of plastic film.

[0006] The moving machine is normally composed of a jointed robot arm that, to wind the covering film around the load to wrap, operates the wrapping head with a lifting and rotating motion around the palletised load which, on the contrary, substantially remains still.

[0007] Alternatively, the moving machine works by moving the wrapping head vertically, simultaneously winding the covering film around the palletised load that turns on a rotating platform.

[0008] The reel is mounted on the wrapping head in a rotating way around its own axis and, while wrapping, is kept substantially vertical and parallel to the lateral sides of the load to wrap.

[0009] The plastic film which unwinds from the reel, therefore, has two opposing longitudinal edges, one top and one bottom, which extend crosswise to the axis of the reel.

[0010] To increase the adhesion force of the plastic film on the pallet, the wrapping head has particular means to roll up, fold and wrap the bottom longitudinal edge on itself as the plastic film is dispensed.

[0011] Due to the effect of rolling up, the bottom longitudinal edge gets thicker, becoming a particularly strong reinforcement border that can be wound around the pallet without breaking.

[0012] Such wrapping stations make it possible to wrap palletised loads of different shapes and sizes.

[0013] To this end, the fact is underlined that, for logistic management reasons, smaller pallets are increasingly resorted to in medium and big distribution chains, conventionally called "demi-pallets" or "semi-pallets" due to the fact their standard dimensions are equivalent to half the size of traditional pallets.

[0014] Unlike traditional pallets, e.g. the so-called "euro-pallet", it is often impossible to use traditional forklift trucks (normally used to load and unload goods) to pick up demi-pallets.

[0015] In fact, the size of traditional pallets is such that both forks of a forklift truck can be inserted either through the long side or the short side of the pallet. Whatever direction the forks are inserted, therefore, the load is lifted with both forks in stable and safe conditions.

[0016] But the width of the demi-pallets on their short side allows just one fork of a traditional forklift truck to be inserted which means that lifting a palletised load under such conditions is particularly awkward and dangerous.

[0017] To overcome such drawbacks and to stabilise the loads on the demi-pallets, two demi-pallets with their loads are normally put on a traditional size auxiliary pallet that can hold both demi-pallets side by side.

[0018] The loads, demi-pallets and auxiliary pallet, thus assembled, are then wrapped together.

[0019] The auxiliary pallet has the purpose of allowing the movement and transport of the two demi-pallets up to the point of delivery where the two loads resting on the demi-pallets can be separated from each other.

[0020] This load wrapping method, however, has some drawbacks among which is the fact that using auxiliary pallets leads to a big increase in overall transportation costs.

[0021] In this regard, the fact is underlined that in some cases the actual cost of the auxiliary pallets has a considerable effect on the final price of the products transported, especially when the goods are particularly bulky and not all that expensive in the first place.

[0022] The necessity to place the demi-pallets and relative loads on top of an auxiliary pallet, furthermore, means that particular types of additional equipment have to be used to lift the demi-pallets and position the auxiliary pallet under them. Inconveniently, said additional equipment constitutes a supplementary cost in terms of installation, maintenance and overall system management.

[0023] To overcome such inconveniences, a particular wrapping process is known where two palletised loads are placed side by side so the two demi-pallets they are put on are placed side by side, and then the plastic film is wrapped around the palletised loads, tightening the reinforcement border of the covering sheet which is folded over itself around the demi-pallets.

[0024] The reinforcement border, in effect, not only allows the stabilising wrap to adhere to the pallets but also makes the demi-pallets integral with each other so they can be transported without using the auxiliary pallet.

[0025] To actuate this process, two consecutive wrapping stations are normally used, each with a rotating platform and a machine to move the reel of plastic film. One wrapping station is for winding single palletised loads, while the other is for wrapping two palletised loads, one against the other.

[0026] In this case, however, the wrapping system becomes particularly complex and costly, both in terms of

installation expenses and in terms of the high running, labour and maintenance costs.

[0027] As an alternative to using two wrapping stations in series, the above mentioned wrapping process can be done with just one station, with just one rotating platform and with just one reel moving machine.

[0028] In this case, the wrapping station works as follows: a first palletised load is wrapped on the rotating platform and then temporarily transferred to an adjacent parking roller unit; a second palletised load is placed on the rotating platform and then wrapped; the first and second palletised loads, both wrapped individually, are then put side by side on the rotating platform and wrapped together.

[0029] Even this solution has several drawbacks, one of them being that system production output is greatly limited by the lengthy down times when no palletised load is being wrapped.

[0030] This is mainly due to the time it takes to place the palletised loads on the rotating platform.

[0031] In fact, the movement of palletised loads that have not yet been stabilised is risky and has to be done slowly so the loads cannot fall or turn over accidentally.

[0032] Summing up then, a great deal of total processing time is required for handling the loads, during which the machine to move the reel of plastic film and the rotating platform are substantially at a standstill.

[0033] The patent document FR 2 622 866 discloses a machine comprising two rotary platforms, on which the products to be packaged are placed, a reel carrying the rolled-up film and a vertical column arranged in the vicinity of the platforms and with the aid of which the reel is displaced simultaneously with the rotation of the platforms.

[0034] The column is provided with suitable: rotational means and is displaced automatically from one platform to the other when packaging is completed on one of them.

Object of the Invention

[0035] The main aim of this invention is to provide a process and a system for wrapping palletised loads that allow to wrap the demi-pallets and the loads on top of them in a practical, easy, quick and functional way and, at the same time, to reduce the overall transportation costs significantly both in terms of less pallets used and in terms of less money spent on installation, maintenance and management of the wrapping station.

[0036] Another object of this invention is to provide a process and a system for wrapping palletised loads that allow to overcome the mentioned drawbacks of the known technique as part of a simple, rational, easy, effective use and low cost solution.

[0037] The objects mentioned above are reached with this process for wrapping palletised loads, characterised by the fact that it comprises the following phases:

- supplying at least a first rotating platform suitable for

receiving in succession at least a first and at least a second palletised loads to wrap, at least a second rotating platform suitable for receiving simultaneously said first and second palletised loads and a single movement machine for moving a covering sheet suitable for cooperating with said first rotating platform to wrap in succession said first and second palletised loads with a first stabilising wrap, and for cooperating with said second rotating platform to wrap together said first and second palletised loads with a second stabilising wrap;

- placing said first palletised load on top of said first rotating platform;
- wrapping said first palletised load placed on top of said first rotating platform with said first stabilising wrap;
- moving said first palletised load away from said first rotating platform;
- placing said second palletised load on top of said first rotating platform;
- wrapping said second palletised load placed on top of said first rotating platform with said first stabilising wrap;
- moving said second palletised load away from said first rotating platform;
- positioning said first and second palletised loads in a double wrapping configuration where said first and second palletised loads are substantially side by side and together on top of said second rotating platform;
- wrapping together said first and second palletised loads in said double wrapping configuration with said second stabilising wrap.

[0038] The above mentioned objects are reached with this system for wrapping palletised loads, comprising at least a first rotating platform suitable for receiving in succession at least a first palletised load and at least a second palletised load to wrap, at least a second rotating platform suitable for receiving simultaneously said first and second palletised loads, and a single movement machine. for moving a covering sheet suitable for cooperating with said first rotating platform to wrap in succession said first and said second palletised loads with a first stabilising wrap and for cooperating with said second rotating platform to wrap together said first and said second palletised loads with a second stabilising wrap in a double wrapping configuration where said first and second palletised loads are substantially side by side and together on top of said second rotating platform, characterised by the fact that it comprises at least one forward movement line of said palletised loads along which said first and said second rotating platforms are arranged.

Brief Description of the Drawings

[0039] Further characteristics and advantages of this invention will appear more evident from the description of a preferred but not only embodiment of a system for

wrapping palletised loads, illustrated indicatively by way of non limiting example in the accompanying drawings, wherein:

figure 1 is a plan view of the system according to the invention;
figure 2 is a side raised, schematic and partial view of the system according to the invention;
figures from 3 to 6 show, in a sequence of plan views, the operation of the system according to the invention.

Embodiments of the Invention

[0040] With particular reference to such figures, a system for wrapping palletised loads has been globally indicated by 1.

[0041] The system 1 comprises a first rotating platform 2 and a second rotating platform 3.

[0042] The first rotating platform 2 is suitable for receiving in succession a first palletised load 4 and a second palletised load 5 to wrap and make them turn around a vertical axis.

[0043] In this regard, note that when, in this paper, it is stated that the first and the second palletised loads 4, 5 are received in succession on the first rotating platform 2 it is meant that the second palletised load 5 does not engage the first rotating platform 2 until the first palletised load 2 is on it and vice versa.

[0044] On the first rotating platform 2, therefore, one palletised load 4, 5 is made to turn at a time.

[0045] The second rotating platform 3, on the other hand, is suitable for receiving simultaneously the first and the second palletised loads 4, 5 and to make them turn simultaneously around a vertical axis.

[0046] The first and the second palletised loads 4, 5 are composed of, respectively, a first load to wrap 4a and a second load to wrap 5a placed, respectively, on top of a first pallet 4b and on top of a second pallet 5b.

[0047] The pallets 4b and 5b consist of two demi-pallets of standardized shapes and dimensions.

[0048] In proximity of the first and of the second platform 2, 3 is arranged a movement machine 6 for moving a dispensing reel 7 of a covering sheet 8.

[0049] The movement machine 6 is suitable for cooperating with the first rotating platform 2 to wrap in succession the first and the second palletised loads 4, 5 with a first stabilising wrap.

[0050] The movement machine 6 is also suitable for cooperating with the second rotating platform 3 to wrap together the first and the second palletised loads 4, 5 with a second stabilising wrap in a double wrapping configuration where the first and the second palletised loads 4, 5 are substantially side by side and together on top of the second rotating platform 3.

[0051] In the embodiments illustrated in the figures, the movement machine 6 comprises an articulated arm 9, the free end of which has a working head 10 that sup-

ports the dispensing reel 7.

[0052] The articulated arm 9 is hinged according to a vertical axis to a fixed base 11, so as to be able to rotate around said axis to bring the dispensing reel 7 close to the first rotating platform 2 or, alternatively, to the second rotating platform 3.

[0053] In proximity of the rotating platforms 2, 3 are arranged respective presser elements 12, 13 suitable for lowering and pressing the palletised loads 4, 5 which are on the first rotating platform 2 or on the second rotating platform 3 respectively so as to keep them stable during wrapping.

[0054] The presser elements 12, 13, in detail, are mounted on corresponding supporting columns 14, 15 and operable sliding in a vertical direction so as to come into contact with the top of the palletised loads 4, 5.

[0055] The system 1 also comprises a forward movement line 16 of the palletised loads 4, 5 along which the first and the second rotating platforms 2, 3 are arranged.

[0056] In detail, the second rotating platform 3 is arranged downstream from the first rotating platform 2 in the direction of movement of the palletised loads 4, 5 along the forward movement line 16.

[0057] This forward movement line is composed of, e.g., a set of transfer means of the palletised loads 4, 5 suitable for placing the first palletised load 4 on top of the first rotating platform 2, for moving the first palletised load 4 away from the first rotating platform 2, for placing the second palletised load 5 on top of the first rotating platform 2, for moving the second palletised load 5 away from the first rotating platform 2, for positioning the palletised loads 4, 5 in the double wrapping configuration on the second rotating platform 3 and, lastly, for moving the palletised loads 4, 5 away from the second rotating platform 3.

[0058] In the particular embodiment of the invention illustrated in the figures, the transfer means 16 comprise: a conveyor belt 17 mounted on a fixed supporting frame arranged immediately upstream of the first rotating platform 2; a first motorised roller unit 18 mounted on the first rotating platform 2; a first roller conveyor 19 mounted on a fixed supporting frame interposed between the first rotating platform 2 and the second rotating platform 3; a second motorised roller unit 20 mounted on the second rotating platform 3; a second roller conveyor 21 mounted on a fixed supporting frame arranged immediately downstream from the second rotating platform 3.

[0059] Advantageously, along the forward movement line 16 is arranged a labelling machine 22 suitable for labelling the palletised loads 4, 5.

[0060] This labelling machine is arranged in proximity of the first roller conveyor 19 and is suitable for affixing one or more labels on the first stabilising wraps of the palletised loads 4, 5 coming from the first rotating platform 2.

[0061] Usefully, the wrapping of the palletised loads 4, 5 inside the system 1 is done by means of the process according to the invention which consists of the following

phases:

- supplying the first rotating platform 2, the second rotating platform 3 and the movement machine 6 of the covering sheet 8;
- placing the first palletised load 4 on top of the first rotating platform 2, making it move forward on the conveyor belt 17 and then on the first motorised roller unit 18;
- wrapping the first palletised load 4 placed on top of the first rotating platform 2 with a first stabilising wrap (figure 3);
- moving the first palletised load 4 away from the first rotating platform 2, making it move forward on the first motorised roller unit 18 and then on the first roller conveyor 19;
- placing the second palletised load 5 on top of the first rotating platform 2, making it move forward on the conveyor belt 17 and then on the first motorised roller unit 18;
- wrapping the second palletised load 5 placed on top of the first rotating platform 2 with a first stabilising wrap (figure 4);
- moving the second palletised load 5 away from the first rotating platform 2, making it move forward on the first motorised roller unit 18 and then on the first roller conveyor 19;
- labelling the palletised loads 4, 5 with the labelling machine 22, affixing one or more labels on the first stabilising wraps of the palletised loads 4, 5 as they go from the first rotating platform 2 to the second rotating platform 3 (figure 5);
- positioning the first and the second palletised loads 4, 5 in the double wrapping configuration on top of the second rotating platform 3, making them move forward on the first roller conveyor 19 and then on the second motorised roller unit 20;
- wrapping together the first and the second palletised loads 4, 5 in the double wrapping configuration with a second stabilising wrap (figure 6);
- moving the first and the second palletised loads 4, 5 away from the second rotating platform 3, making them move forward on the second motorised roller unit 20 and then on the second roller conveyor 21.

[0062] Usefully, after the labelling phase the process according to the invention also contemplates an additional phase that consists of joining the pallet 4b of the first palletised load 4 and the pallet 5b of the second palletised load 5 together in the double wrapping configuration.

[0063] In the particular embodiment of the invention illustrated in the figures, this phase of joining occurs simultaneously with the wrapping together phase of the first and second palletised loads 4, 5 (figure 6).

[0064] In fact, the joining phase consists of folding the bottom longitudinal edge of the covering sheet 8 over on itself with the aid of a wheel 23 so as to form a reinforcement border 24 and wrapping once or more times the

covering sheet 8 around the first and the second palletised loads 4, 5 in the double wrapping configuration, tightening the reinforcement border 24 around the pallets 4b, 5b of the first and of the second palletised loads 4, 5 to form one or more holding coils of the pallets.

[0065] All the coils tightened around the pallets 4b, 5b make the pallets 4b, 5b practically integral with each other and confer to the palletised loads 4, 5 the stability and the stiffness necessary to be transported without being placed on top of an auxiliary pallet (figure 2).

[0066] The number of coils tightened around the pallets 4b, 5b corresponds to the number of wrappings of the covering sheet 8 around the base of the loads to wrap 4a, 5a and can vary according to load type.

[0067] Alternative embodiments of this invention are not, however, excluded where the joining phase is different and consists of, e.g., an intermediate station placed in between the first and the second platforms 2, 3 and suitable for lifting the palletised loads 4, 5 and for placing them on top of an auxiliary pallet of a bigger size.

[0068] In this case, the phase of wrapping together the first and the second palletised loads 4, 5 on the second rotating platform 3 does not necessitate the application of a set of coils to hold the pallets 4b, 5b and consists of winding the covering sheet 8 around the auxiliary pallet.

[0069] In the particular embodiment of the invention illustrated in the figures, moreover, the palletised loads 4, 5 to wrap together on the second rotating platform 3 are only two.

[0070] Alternative embodiments of this invention are not, however, excluded where, on the first rotating platform 2, three or more palletised loads are wrapped in succession which, once transferred on to the second rotating platform 3, are wrapped together in exactly the same way as described and illustrated previously.

[0071] It has in point of fact being ascertained how the described invention achieves the proposed objects.

[0072] The invention thus conceived is susceptible to numerous modifications and variations, all of which falling within the scope of the inventive concept. Furthermore all the details can be replaced with others that are technically equivalent.

[0073] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements without because of this moving outside the protection scope of the following claims.

Claims

1. Process for wrapping palletised loads (4, 5), **characterised by** the fact that it comprises the following phases:

- supplying at least a first rotating platform (2) suitable for receiving in succession at least a first and at least a second palletised loads (4, 5) to wrap, at least a second rotating platform (3)

- suitable for receiving simultaneously said first and second palletised loads (4, 5) and a single movement machine (6) for moving a covering sheet (8) suitable for cooperating with said first rotating platform (2) to wrap in succession said first and second palletised loads (4, 5) with a first stabilising wrap, and for cooperating with said second rotating platform (3) to wrap together said first and second palletised loads (4, 5) with a second stabilising wrap;
- placing said first palletised load (4) on top of said first rotating platform (2);
 - wrapping said first palletised load (4) placed on top of said first rotating platform (2) with said first stabilising wrap;
 - moving said first palletised load (4) away from said first rotating platform (2);
 - placing said second palletised load (5) on top of said first rotating platform (2);
 - wrapping said second palletised load (5) placed on top of said first rotating platform (2) with said first stabilising wrap;
 - moving said second palletised load (5) away from said first rotating platform (2);
 - positioning said first and second palletised loads (4, 5) in a double wrapping configuration where said first and second palletised loads (4, 5) are substantially side by side and together on top of said second rotating platform (3);
 - wrapping together said first and second palletised loads (4, 5) in said double wrapping configuration with said second stabilising wrap.
2. Process according to claim 1, **characterised by** the fact that said phases of placing, said phases of moving away and said phase of positioning comprise moving said first and said second palletised loads (4, 5) forward along a forward movement line (16) along which said first and said second rotating platforms (2, 3) are arranged.
 3. Process according to claim 2, **characterised by** the fact that said second rotating platform (3) is arranged downstream from said first rotating platform (2) along said forward movement line (16).
 4. Process according to one or more of the preceding claims, **characterised by** the fact that it comprises labelling at least one between said first and said second palletised loads (4, 5).
 5. Process according to claim 4, **characterised by** the fact that said labelling comprises affixing at least one label on at least one between said first and said second stabilising wraps.
 6. Process according to claim 4 or 5, **characterised by** the fact that said labelling said first palletised load (4) occurs after said moving the first palletised load (4) away from said first rotating platform (2).
 7. Process according to one or more of claims 4 to 6, **characterised by** the fact that said labelling said second palletised load (5) occurs after said moving the second palletised load (5) away from said first rotating platform (2).
 8. Process according to one or more of the preceding claims, **characterised by** the fact that it comprises joining the pallet (4b) of said first palletised load (4) and the pallet (5b) of said second palletised load (5) together in said double wrapping configuration.
 9. Process according to claim 8, **characterised by** the fact that said joining occurs during said wrapping together said first and second palletised loads (4, 5).
 10. Process according to claim 9, **characterised by** the fact that said joining comprises folding at least one longitudinal edge of the covering sheet (8) over on itself so as to form a reinforcement border (24) and wrapping at least once the covering sheet (8) around said first and said second palletised loads (4, 5) in said double wrapping configuration, tightening said reinforcement border (24) around the pallets (4b, 5b) of said first and of said second palletised loads (4, 5) to form at least one holding coil of the pallets (4b, 5b).
 11. Process according to one or more of the preceding claims, **characterised by** the fact that at least one of the pallets (4b, 5b) of said first and of said second palletised loads (4, 5) is of the "demi-pallet" type.
 12. System (1) for wrapping palletised loads (4, 5), comprising at least a first rotating platform (2) suitable for receiving in succession at least a first palletised load (4) and at least a second palletised load (5) to wrap, at least a second rotating platform (3) suitable for receiving simultaneously said first and second palletised loads (4, 5), and a single a movement machine (6) for moving a covering sheet (8) suitable for cooperating with said first rotating platform (2), to wrap in succession said first and said second palletised loads (4, 5) with a first stabilising wrap and for cooperating with said second rotating platform (3) to wrap together said first and said second palletised loads (4, 5) with a second stabilising wrap in a double wrapping configuration where said first and second palletised loads (4, 5) are substantially side by side and together on top of said second rotating platform (3), **characterised by** the fact that it comprises at least one forward movement line (16) of said palletised loads (4, 5) along which said first and said second rotating platforms (2, 3) are arranged.

13. System (1) according to claim 12, **characterised by** the fact that said second rotating platform (3) is arranged downstream from said first rotating platform (2) along said forward movement line (16). 5
14. System (1) according to claim 12 or 13, **characterised by** the fact that said forward movement line (16) comprises transfer means of said palletised loads (4, 5) suitable for placing said first palletised load (4) on top of said first rotating platform (2), for moving said first palletised load (4) away from said first rotating platform (2), for placing said second palletised load (5) on top of said first rotating platform (2), for moving said second palletised load (5) away from said first rotating platform (2) and for positioning said first and said second palletised loads (4,5) in said double wrapping configuration. 10
15. System (1) according to claim 14, **characterised by** the fact that said transfer means (16) comprise at least one conveyor belt (17) mounted on a fixed supporting frame arranged upstream of said first rotating platform (2). 20
16. System (1) according to claim 14 or 15, **characterised by** the fact that said transfer means (16) comprise at least one first roller unit (18) mounted on said first rotating platform (2). 25
17. System (1) according to one or more of claims 14 to 16, **characterised by** the fact that said transfer means (16) comprise at least a first roller conveyor (19) mounted on a fixed supporting frame substantially interposed between said first and said second rotating platforms (2, 3). 30
18. System (1) according to one or more of claims 14 to 17, **characterised by** the fact that said transfer means (16) comprise at least a second roller unit (20) mounted on said second rotating platform (3). 35
19. System (1) according to one or more of claims 14 to 18, **characterised by** the fact that said transfer means (16) comprise at least a second roller conveyor (21) mounted on a fixed supporting frame arranged downstream from said second rotating platform (3). 40
20. System (1) according to one or more of claims 12 to 19, **characterised by** the fact that it comprises at least one labelling machine (22) suitable for labelling at least one between said first and said second palletised loads (4, 5). 45
21. System (1) according to claim 20, **characterised by** the fact that said labelling machine (22) is arranged along said forward movement line (16). 50

22. System (1) according to one or more of claims 12 to 21, **characterised by** the fact that said labelling machine (22) is arranged in proximity of said first roller conveyor (19). 5

23. System (1) according to one or more of claims 12 to 22, **characterised by** the fact that at least one of the pallets (4b, 5b) of said first and of said second palletised loads (4, 5) is of the "demi-pallet" type. 10

Patentansprüche

1. Verfahren zum Einwickeln von palettierten Lasten (4, 5), **dadurch gekennzeichnet, dass** es folgende Phasen aufweist:

Beliefern mindestens einer ersten drehenden Plattform (2), die geeignet ist, nacheinander mindestens eine erste und mindestens eine zweite palettierte Last (4, 5) zum Einwickeln aufzunehmen, mindestens einer zweiten drehenden Plattform (3), die geeignet ist, gleichzeitig die erste und die zweite palettierte Last (4, 5) aufzunehmen, und einer einzelnen Bewegungsmaschine (6) zum Bewegen einer Hüllfolie (8), die geeignet ist, beim Einwickeln der ersten und der zweiten palettierten Last (4, 5) nacheinander in eine erste stabilisierende Hülle mit der ersten drehenden Plattform (2) zusammenzuarbeiten und beim Einwickeln der ersten und der zweiten palettierten Last (4, 5) zusammen in eine zweite stabilisierende Hülle mit der zweiten drehenden Plattform (3) zusammenzuarbeiten;
Absetzen der ersten palettierten Last (4) auf die erste drehende Plattform (2);
Einwickeln der auf der ersten drehenden Plattform (2) abgesetzten, ersten palettierten Last (4) in die erste stabilisierende Hülle;
Bewegen der ersten palettierten Last (4) fort von der ersten drehenden Plattform (2);
Absetzen der zweiten palettierten Last (5) auf die erste drehende Plattform (2);
Einwickeln der auf der ersten drehenden Plattform (2) abgesetzten, zweiten palettierten Last (5) in die erste stabilisierende Hülle;
Bewegen der zweiten palettierten Last (5) fort von der ersten drehenden Plattform (2);
Positionieren der ersten und der zweiten palettierten Last (4, 5) in einer Doppeleinwickelkonfiguration, bei der die erste und die zweite palettierte Last (4, 5) sich im Wesentlichen Seite an Seite und zusammen auf der zweiten drehenden Plattform (3) befinden;
Einwickeln der ersten und der zweiten palettierten Last (4, 5) zusammen in der Doppeleinwickelkonfiguration in die zweite stabilisierende Hülle.

2. Verfahren gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Phasen des Absetzens, die Phasen des Fortbewegens und die Phase des Positionierens das Bewegen der ersten und der zweiten palettierten Last (4, 5) vorwärts entlang einer Vorwärtsbewegungslinie (16), entlang der die erste und die zweite drehende Plattform (2, 3) angeordnet sind, aufweisen.
3. Verfahren gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die zweite drehende Plattform (3) der ersten drehenden Plattform (2) entlang der Vorwärtsbewegungslinie (16) nachgeschaltet ist.
4. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** es das Etikettieren mindestens der ersten oder der zweiten palettierten Last (4, 5) aufweist.
5. Verfahren gemäß Anspruch 4, **dadurch gekennzeichnet, dass** das Etikettieren das Anbringen mindestens eines Etiketts auf mindestens der ersten oder der zweiten stabilisierenden Hülle aufweist.
6. Verfahren gemäß Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** das Etikettieren der ersten palettierten Last (4) nach dem Bewegen der ersten palettierten Last (4) fort von der ersten drehenden Plattform (2) geschieht.
7. Verfahren gemäß einem oder mehr der Ansprüche 4 bis 6, **dadurch gekennzeichnet, dass** das Etikettieren der zweiten palettierten Last (5) nach dem Bewegen der zweiten palettierten Last (5) fort von der ersten drehenden Plattform (2) geschieht.
8. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** es das Zusammensetzen der Palette (4b) der ersten palettierten Last (4) und der Palette (5b) der zweiten palettierten Last (5) in der Doppeleinwickelkonfiguration aufweist.
9. Verfahren gemäß Anspruch 8, **dadurch gekennzeichnet, dass** das Zusammensetzen während des Einwickelns der ersten und der zweiten palettierten Last (4, 5) zusammen geschieht.
10. Verfahren gemäß Anspruch 9, **dadurch gekennzeichnet, dass** das Zusammensetzen das Falten mindestens einer Längskante der Hüllfolie (8) um sich selbst zum Bilden eines Verstärkungsrandes (24) und das mindestens einmalige Wickeln der Hüllfolie (8) um die erste und die zweite palettierte Last (4, 5) in der Doppeleinwickelkonfiguration, das Spannen des Verstärkungsrandes (24) um die Paletten (4b, 5b) der ersten und der zweiten palettierten Last (4, 5) zum Bilden mindestens einer Haltewicklung der Paletten (4b, 5b) aufweist.
11. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** mindestens eine der Paletten (4b, 5b) der ersten und der zweiten palettierten Last (4, 5) vom Typ "Halbpalette" ist.
12. System (1) zum Einwickeln von palettierten Lasten (4, 5), mit mindestens einer ersten drehenden Plattform (2), die geeignet ist, nacheinander mindestens eine erste palettierte Last (4) und mindestens eine zweite palettierte Last (5) zum Einwickeln aufzunehmen, mindestens einer zweiten drehenden Plattform (3), die geeignet ist, gleichzeitig die erste und die zweite palettierte Last (4, 5) aufzunehmen, und einer einzelnen Bewegungsmaschine (6) zum Bewegen einer Hüllfolie (8), die geeignet ist, beim Einwickeln der ersten und der zweiten palettierten Last (4, 5) nacheinander in eine erste stabilisierende Hülle mit der ersten drehenden Plattform (2) zusammenzuarbeiten und beim Einwickeln der ersten und der zweiten palettierten Last (4, 5) zusammen in eine zweite stabilisierende Hülle in einer Doppeleinwickelkonfiguration mit der zweiten drehenden Plattform (3) zusammenzuarbeiten, wobei die erste und die zweite palettierte Last (4, 5) sich im Wesentlichen Seite an Seite und zusammen auf der zweiten drehenden Plattform (3) befinden, **dadurch gekennzeichnet, dass** es mindestens eine Vorwärtsbewegungslinie (16) für die palettierten Lasten (4, 5) aufweist, entlang der die erste und die zweite drehende Plattform (2, 3) angeordnet sind.
13. System (1) gemäß Anspruch 12, **dadurch gekennzeichnet, dass** die zweite drehende Plattform (3) der ersten drehenden Plattform (2) entlang der Vorwärtsbewegungslinie (16) nachgeschaltet ist.
14. System (1) gemäß Anspruch 12 oder 13, **dadurch gekennzeichnet, dass** die Vorwärtsbewegungslinie (16) eine Übergabeeinrichtung für die palettierten Lasten (4, 5) aufweist, die geeignet ist, die erste palettierte Last (4) auf die erste drehende Plattform (2) abzusetzen, die erste palettierte Last (4) von der ersten drehenden Plattform (2) fortzubewegen, die zweite palettierte Last (5) auf die erste drehende Plattform (2) abzusetzen, die zweite palettierte Last (5) von der ersten drehenden Plattform (2) fortzubewegen und die erste und die zweite palettierte Last (4, 5) in der Doppeleinwickelkonfiguration zu positionierten.
15. System (1) gemäß Anspruch 14, **dadurch gekennzeichnet, dass** die Übergabeeinrichtung (16) mindestens ein Förderband (17) aufweist, das an einem festen Halterahmen, welcher der ersten drehenden Plattform (2) vorgeschaltet ist, montiert ist.

16. System (1) gemäß Anspruch 14 oder 15, **dadurch gekennzeichnet, dass** die Übergabeeinrichtung (16) mindestens eine erste Rolleneinheit (18) aufweist, die auf der ersten drehenden Plattform (2) montiert ist. 5
17. System (1) gemäß einem oder mehr der Ansprüche 14 bis 16, **dadurch gekennzeichnet, dass** die Übergabeeinrichtung (16) mindestens einen Rollenförderer (19) aufweist, der auf einem festen, im Wesentlichen zwischen der ersten und der zweiten drehenden Plattform (2, 3) angeordneten Halterahmen montiert ist. 10
18. System (1) gemäß einem oder mehr der Ansprüche 14 bis 17, **dadurch gekennzeichnet, dass** die Übergabeeinrichtung (16) mindestens eine zweite Rolleneinheit (20) aufweist, die auf der zweiten drehenden Plattform (3) montiert ist. 15
19. System (1) gemäß einem oder mehr der Ansprüche 14 bis 18, **dadurch gekennzeichnet, dass** die Übergabeeinrichtung (16) mindestens einen zweiten Rollenförderer (21) aufweist, der auf einem festen, der zweiten drehenden Plattform (3) nachgeschalteten Halterahmen montiert ist. 20
20. System (1) gemäß einem oder mehr der Ansprüche 12 bis 19, **dadurch gekennzeichnet, dass** es mindestens eine Etikettiermaschine (22) aufweist, die geeignet ist, mindestens die erste oder die zweite palettierte Last (4, 5) zu etikettieren. 25
21. System (1) gemäß Anspruch 20, **dadurch gekennzeichnet, dass** die Etikettiermaschine (22) entlang der Vorwärtsbewegungslinie (16) angeordnet ist. 30
22. System (1) gemäß einem oder mehr der Ansprüche 12 bis 21, **dadurch gekennzeichnet, dass** die Etikettiermaschine (22) in der Nähe des ersten Rollenförderers (19) angeordnet ist. 35
23. System (1) gemäß einem oder mehr der Ansprüche 12 bis 22, **dadurch gekennzeichnet, dass** mindestens eine der Paletten (4b, 5b) der ersten und der zweiten palettierten Last (4, 5) vom Typ "Halbpalette" ist. 40

Revendications 50

1. Procédé d'emballage de charges palettisées (4, 5), **caractérisé par le fait qu'il** comprend les étapes suivantes : 55
- mise à disposition d'au moins une première plateforme tournante (2) apte à recevoir à la file au moins une première et au moins une deuxième

me charges palettisées (4, 5) à emballer, d'au moins une deuxième plateforme tournante (3) apte à recevoir simultanément lesdites première et deuxième charges palettisées (4, 5) et d'une unique machine de manoeuvre (6) pour déplacer une feuille de couverture (8) apte à coopérer avec ladite première plateforme tournante (2) afin d'envelopper successivement lesdites première et deuxième charges palettisées (4, 5) avec un premier emballage stabilisateur, et à coopérer avec ladite deuxième plateforme tournante (3) afin d'envelopper ensemble lesdites première et deuxième charges palettisées (4, 5) avec un deuxième emballage stabilisateur ;

- mise en place de ladite première charge palettisée (4) sur ladite première plateforme tournante (2) ;
- emballage de ladite première charge palettisée (4) déposée sur ladite première plateforme tournante (2) avec ledit premier emballage stabilisateur ;
- éloignement de ladite première charge palettisée (4) de ladite première plateforme tournante (2) ;
- mise en place de ladite deuxième charge palettisée (5) sur ladite première plateforme tournante (2) ;
- emballage de ladite deuxième charge palettisée (5) déposée sur ladite première plateforme tournante (2) avec ledit premier emballage stabilisateur ;
- éloignement de ladite deuxième charge palettisée (5) de ladite première plateforme tournante (2) ;
- positionnement desdites première et deuxième charges palettisées (4, 5) dans une configuration de double emballage dans laquelle lesdites première et deuxième charges palettisées (4, 5) sont situées sensiblement côte à côte et ensemble sur ladite deuxième plateforme tournante (3) ;
- emballage ensemble desdites première et deuxième charges palettisées (4, 5) dans ladite configuration de double emballage avec ledit deuxième emballage stabilisateur.

2. Procédé selon la revendication 1, **caractérisé par le fait que** lesdites phases de mise en place, lesdites phases d'éloignement et ladite phase de positionnement comprennent le déplacement vers l'avant de ladite première et de ladite deuxième charges palettisées (4, 5) le long d'une ligne (16) de déplacement vers l'avant sur laquelle sont placées ladite première et ladite deuxième plateformes tournantes (2,3).
3. Procédé selon la revendication 2, **caractérisé par le fait que** ladite deuxième plateforme tournante (3) est placée en aval de ladite première plateforme

- tournante (2) sur ladite ligne (16) de déplacement vers l'avant.
4. Procédé selon l'une ou plusieurs des revendications précédentes, **caractérisé par le fait qu'il** comprend l'étiquetage d'au moins l'une d'entre ladite première et ladite deuxième charges palettisées (4, 5). 5
 5. Procédé selon la revendication 4, **caractérisé par le fait que** ledit étiquetage comprend l'apposition d'au moins une étiquette sur au moins l'un d'entre ledit premier et ledit deuxième emballages stabilisateurs. 10
 6. Procédé selon la revendication 4 ou 5, **caractérisé par le fait que** ledit étiquetage de ladite première charge palettisée (4) s'effectue après ledit éloignement de la première charge palettisée (4) de ladite première plateforme tournante (2). 15
 7. Procédé selon l'une ou plusieurs des revendications 4 à 6, **caractérisé par le fait que** ledit étiquetage de ladite deuxième charge palettisée (5) s'effectue après ledit éloignement de la deuxième charge palettisée (5) de ladite première plateforme tournante (2). 20 25
 8. Procédé selon l'une ou plusieurs des revendications précédentes, **caractérisé par le fait qu'il** comprend la réunion de la palette (4b) de ladite première charge palettisée (4) et de la palette (5b) de ladite deuxième charge palettisée (5) dans ladite configuration de double emballage. 30
 9. Procédé selon la revendication 8, **caractérisé par le fait que** ladite réunion s'effectue pendant ledit emballage ensemble desdites première et deuxième charges palettisées (4, 5). 35
 10. Procédé selon la revendication 9, **caractérisé par le fait que** ladite réunion comprend le repli sur lui-même d'au moins un bord longitudinal de la feuille de couverture (8) afin de former une bordure de renforcement (24) et l'enroulement, au moins une fois, de la feuille de couverture (8) autour de ladite première et de ladite deuxième charges palettisées (4, 5) dans ladite configuration de double emballage, le serrage de ladite bordure de renforcement (24) autour des palettes (4b, 5b) de ladite première et de ladite deuxième charges palettisées (4, 5) pour former au moins une bobine de maintien des palettes (4b, 5b). 40 45 50
 11. Procédé selon l'une ou plusieurs des revendications précédentes, **caractérisé par le fait qu'au moins** l'une des palettes (4b, 5b) de ladite première et de ladite deuxième charges palettisées (4, 5) est du type "demi-palette". 55
 12. Système (1) pour emballer des charges palettisées (4, 5), comprenant au moins une première plateforme tournante (2) apte à recevoir à la file une première charge palettisée (4) et au moins une deuxième charge palettisée (5) à emballer, au moins une deuxième plateforme tournante (3) apte à recevoir simultanément lesdites première et deuxième charges palettisées (4, 5) et une unique machine de manœuvre (6) pour déplacer une feuille de couverture (8) apte coopérer avec ladite première plateforme tournante (2) afin d'envelopper successivement ladite première et ladite deuxième charges palettisées (4, 5) avec un premier emballage stabilisateur, et à coopérer avec ladite deuxième plateforme tournante (3) afin d'envelopper ensemble ladite première et ladite deuxième charges palettisées (4, 5) avec un deuxième emballage stabilisateur dans une configuration de double emballage dans laquelle lesdites première et deuxième charges palettisées (4, 5) sont situées sensiblement côte à côte et ensemble sur ladite deuxième plateforme tournante (3), **caractérisé par le fait qu'il** comprend au moins une ligne (16) de déplacement vers l'avant desdites charges palettisées (4, 5) sur laquelle sont placées ladite première et ladite deuxième plateformes tournantes (2, 3).
 13. Système (1) selon la revendication 12, **caractérisé par le fait que** ladite deuxième plateforme tournante (3) est située en aval de ladite première plateforme tournante (2) sur ladite ligne (16) de déplacement vers l'avant.
 14. Système (1) selon la revendication 12 ou 13, **caractérisé par le fait que** ladite ligne (16) de déplacement vers l'avant comprend des moyens de transfert desdites charges palettisées (4, 5) aptes à placer ladite première charge palettisée (4) sur ladite première plateforme tournante (2), à éloigner ladite première charge palettisée (4) de ladite première plateforme tournante (2), à placer ladite deuxième charge palettisée (5) sur ladite première plateforme tournante (2), à éloigner ladite deuxième charge palettisée (5) de ladite première plateforme tournante (2), et à positionner ladite première et ladite deuxième charges palettisées (4, 5) dans ladite configuration de double emballage.
 15. Système (1) selon la revendication 14, **caractérisé par le fait que** lesdits moyens de transfert (16) comprennent au moins une bande transporteuse (17) montée sur un bâti de support fixe placé en amont de ladite première plateforme tournante (2).
 16. Système (1) selon la revendication 14 ou 15, **caractérisé par le fait que** lesdits moyens de transfert (16) comprennent au moins une première unité (18) à rouleaux montée sur ladite première plateforme

tournante (2).

17. Système (1) selon l'une ou plusieurs des revendications 14 à 16, **caractérisé par le fait que** lesdits moyens de transfert (16) comprennent au moins un premier transporteur (19) à rouleaux monté sur un bâti de support fixe essentiellement placé entre ladite première et ladite deuxième plateformes tournantes (2, 3). 5
18. Système (1) selon l'une ou plusieurs des revendications 14 à 17, **caractérisé par le fait que** lesdits moyens de transfert (16) comprennent au moins une deuxième unité (20) à rouleaux montée sur ladite deuxième plateforme tournante (3). 10 15
19. Système (1) selon l'une ou plusieurs des revendications 14 à 18, **caractérisé par le fait que** lesdits moyens de transfert (16) comprennent au moins un deuxième transporteur (21) à rouleaux monté sur un bâti de support fixe placé en aval de ladite deuxième plateforme tournante (3). 20
20. Système (1) selon l'une ou plusieurs des revendications 12 à 19, **caractérisé par le fait qu'il** comprend au moins une machine à étiqueter (22) apte à étiqueter au moins l'une d'entre ladite première et ladite deuxième charges palettisées (4, 5). 25
21. Système (1) selon la revendication 20, **caractérisé par le fait que** ladite machine à étiqueter (22) est placée sur ladite ligne (16) de déplacement vers l'avant. 30
22. Système (1) selon l'une ou plusieurs des revendications 12 à 21, **caractérisé par le fait que** ladite machine à étiqueter (22) est placée à proximité dudit premier transporteur (19) à rouleaux. 35
23. Système (1) selon l'une ou plusieurs des revendications 12 à 22, **caractérisé par le fait qu'au** moins l'une des palettes (4b, 5b) de ladite première et de ladite deuxième charges palettisées (4, 5) est du type "demi-palette". 40

45

50

55

Fig. 1

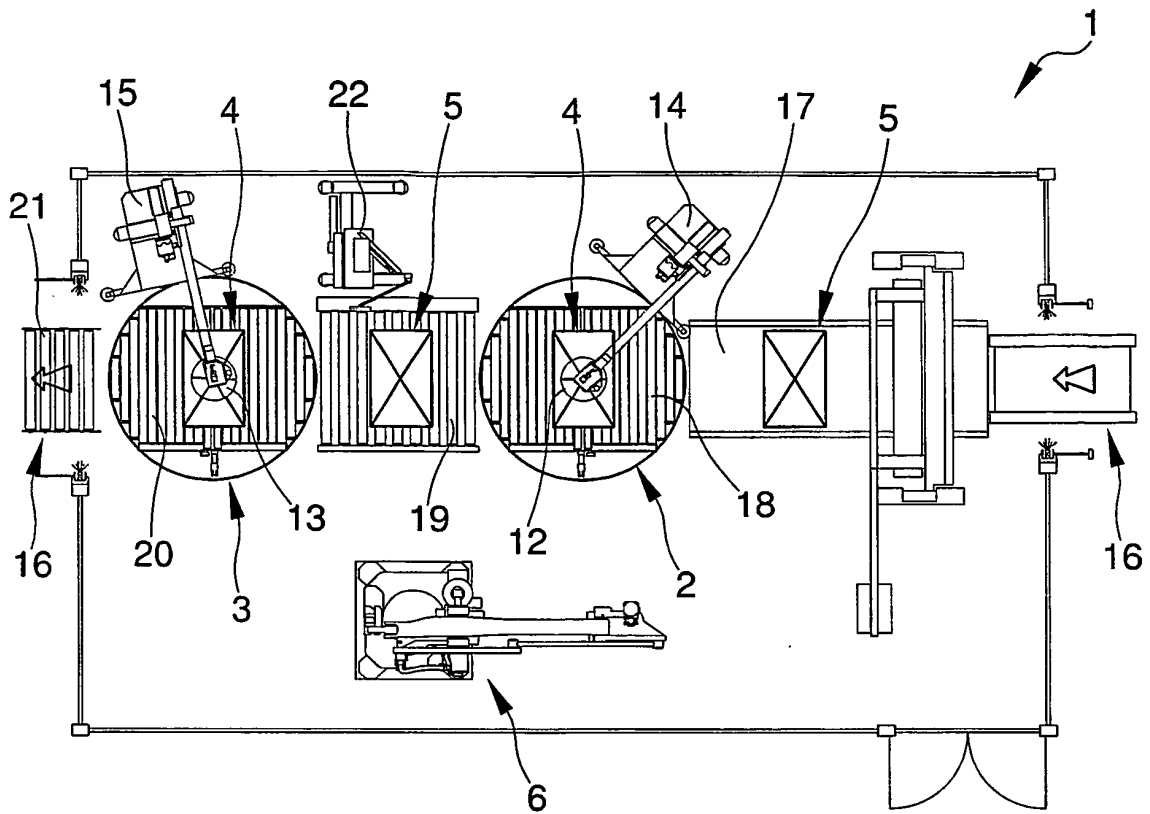


Fig. 2

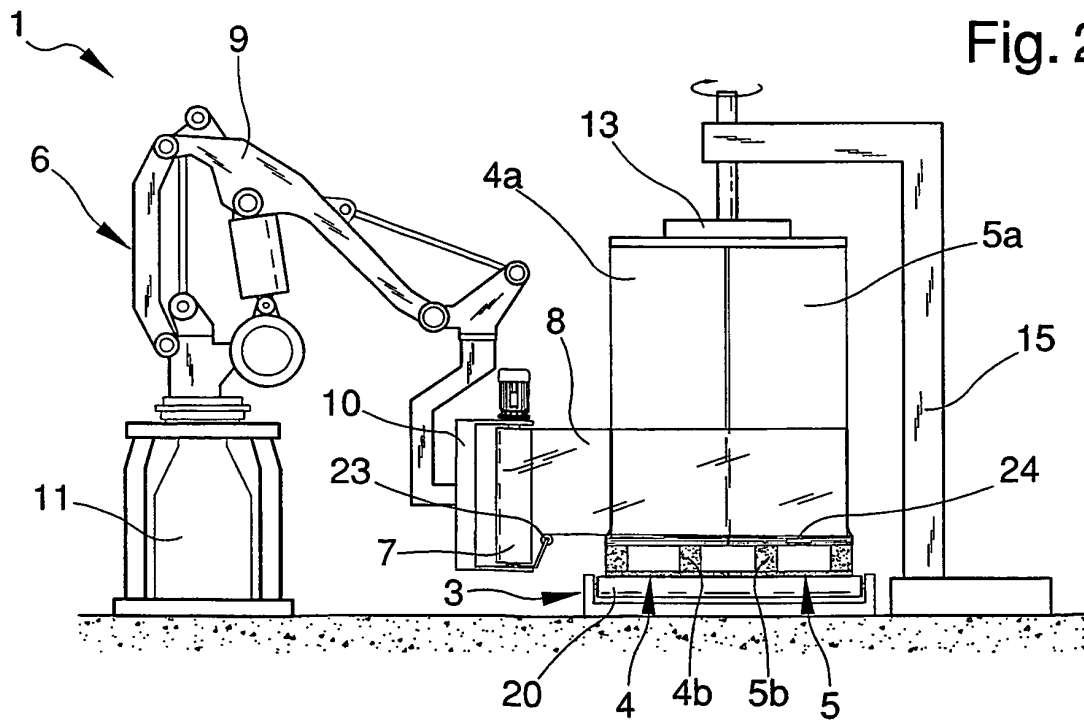


Fig. 3

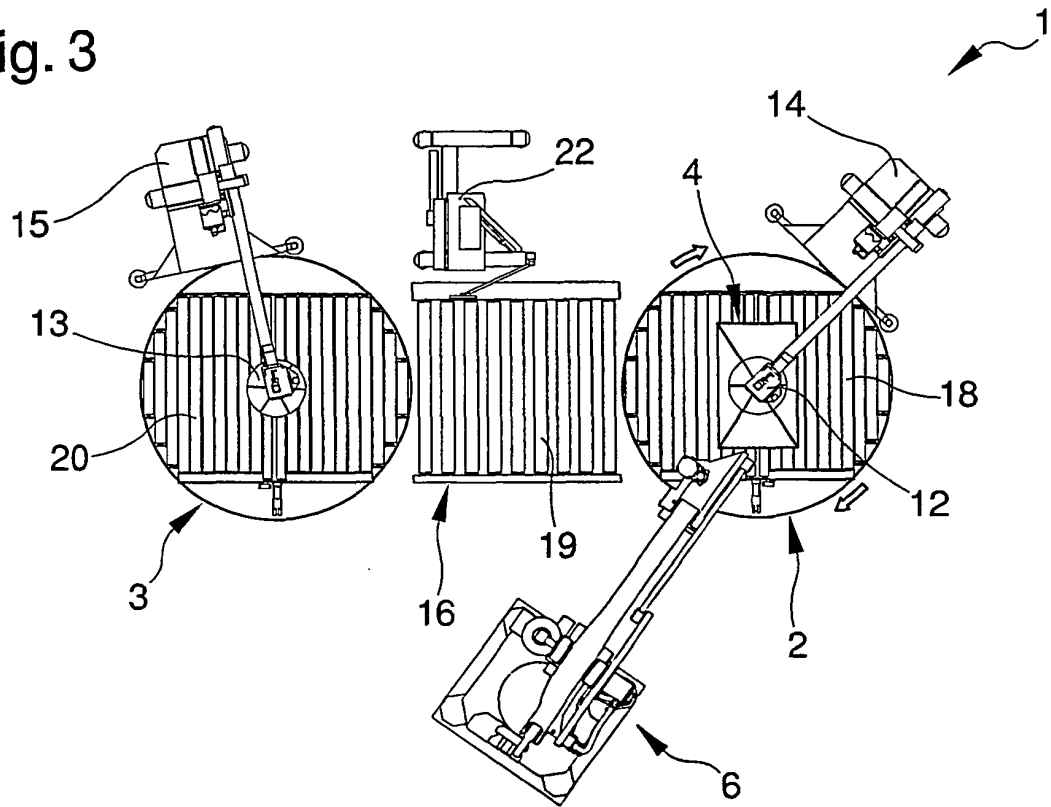


Fig. 4

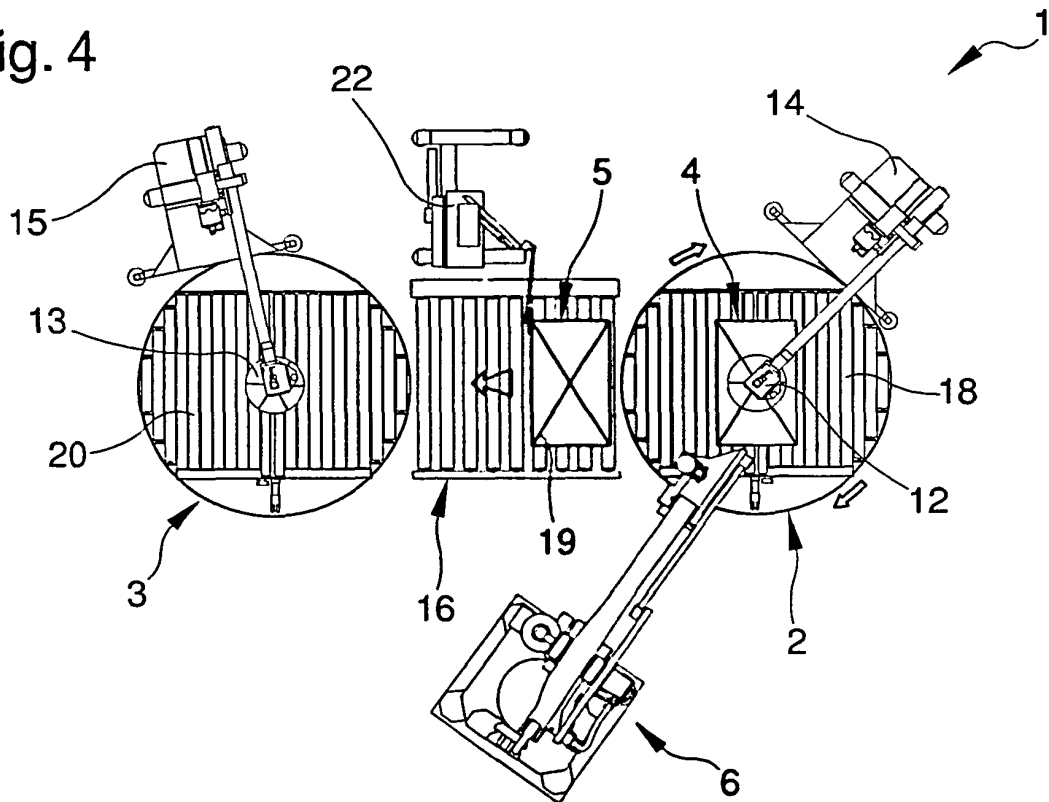


Fig. 5

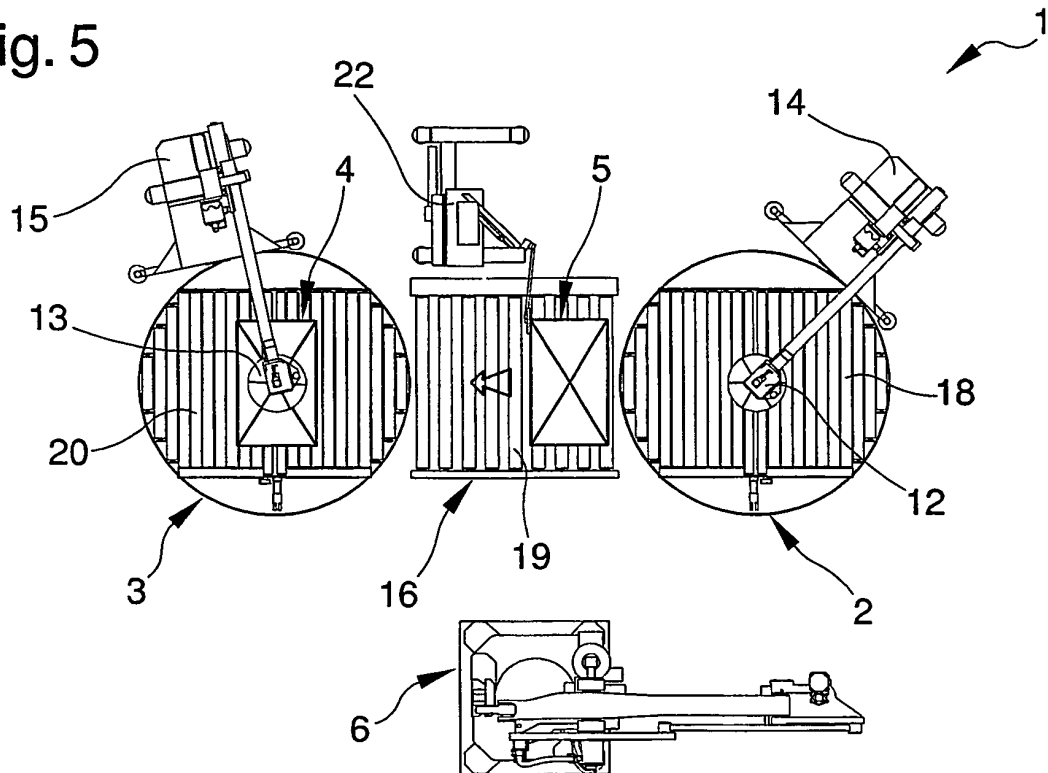
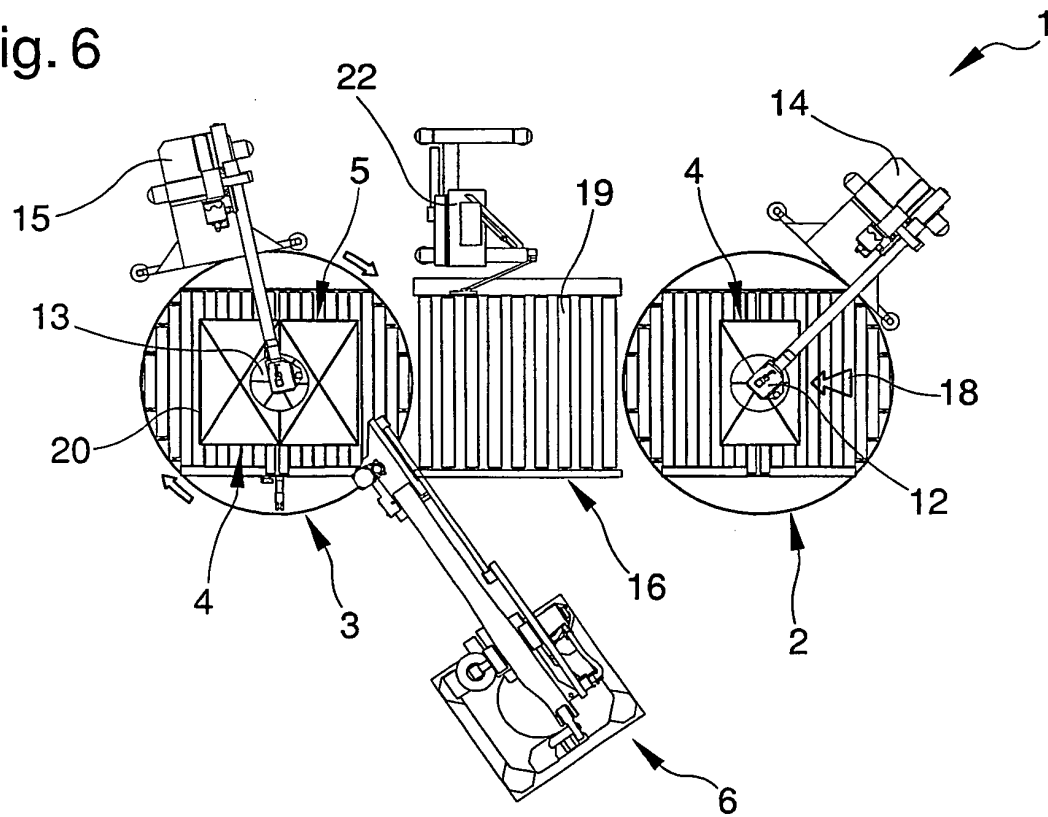


Fig. 6



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- FR 2622866 [0033]