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(54) PROCESS FOR WRAPPING PALLETISED LOADS

VERFAHREN ZUM EINWICKELN VON PALLETIERTEN LASTEN

PROCEDE D'EMBALLAGE DE CHARGES PALETTISEES

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Description

Technical Field

[0001] The present invention relates to a process for wrapping palletised loads.

Background art

[0002] As is common knowledge (see e.g. GB-A-2 201 650), 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 wrap the usual way is to tightly wrap the sides of the load and of the 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 specific means suitable for rolling up, folding and winding the bottom longitudinal edge on itself as the plastic film is dispensed.

[0011] Due to the effect of this rolling up, the bottom longitudinal edge increases in thickness until a proper reinforcement border is defined that has considerable resistance and can be wound around the pallet without breaking. Such wrapping stations-permit to wrap palletised loads having different shapes and dimensions.

[0012] In this regard, the fact is underlined that, for logistic management reasons, in medium- and large-scale distribution the choice is increasingly for small pallets which are conventionally called "demi-pallets" or "semi-pallets" in that they have standardised dimensions which are equivalent to half that of traditional pallets.

[0013] Unlike traditional pallets, like the so-called "Euro-pallets", the problem with demi-pallets is that they cannot always be picked up by traditional forklift trucks used normally in the areas of goods loading and unloading.

[0014] The dimensions of traditional pallets allow both forks of forklift trucks to be inserted both in the long and in the short sides of pallets with no problem.

[0015] This means that in whatever direction the forks are inserted the load is lifted with both forks ensuring stability and safety.

[0016] The width of the short side of demi-pallets however allows insertion of just one fork of traditional forklift trucks and, under these conditions, the palletised load is particularly difficult to lift besides being dangerous.

[0017] To overcome these drawbacks, the stabilization of loads on demi-pallets usually consists in positioning two demi-pallets and their respective loads on an auxiliary traditional size pallet and such to allow both demi-pallets to be positioned on it, one by the side of the other.

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

[0019] The purpose of the auxiliary pallet is to allow movement and transport of the two demi-pallets to the point of delivery where the two loads resting on the demi-pallets can then be separated from one another.

[0020] However, this system of wrapping the loads does have some drawbacks one of which is the fact that the use of auxiliary pallets involves a considerable increase in overall shipping costs.

[0021] In this regard, the fact is underlined that in some cases the actual cost of the auxiliary pallets weighs heavily on the final price of the products transported, especially if the goods are particularly bulky and not expensive.

[0022] The necessity of placing demi-pallets and their relative loads on top of an auxiliary pallet also means that special additional equipment has to be used for lifting the demi-pallets and putting the auxiliary pallet under them. Inconveniently, such additional equipment means additional costs in terms of installation, maintenance and overall management of the system.

Object of the invention

[0023] The main aim of the present invention is to provide a process for wrapping palletised loads that allows the demi-pallets and their relative loads placed on top of them to be wrapped in a practical, easy and functional way while simultaneously reducing overall transport costs quite considerably both in terms of less pallets used and in terms of less expense for installation, maintenance and management of the wrapping system.

[0024] Another object of the present invention is to provide a process for wrapping palletised loads that allows to overcome the mentioned drawbacks of the prior art as part of a simple, rational, easy, effective use and low cost solution.

[0025] The objects mentioned above are all achieved by this process for wrapping palletised loads, characterized in that it comprises the following steps:

- supply at least one first palletised load with one first load to wrap placed on top of a first pallet;
- supply at least one second palletised load with one second load to wrap placed on top of a second pallet;
- position said first and second palletised loads in a wrapping configuration wherein said first and second pallets are substantially side by side and approached inside a wrapping station suitable for wrapping said palletised loads with a covering sheet that has at least one longitudinal edge substantially rolled up on itself to form a reinforcement border;
- wind at least once the covering sheet around said first and second palletised loads in said wrapping configuration, tightening said reinforcement border around said first and second pallets to form at least one turn to hold the pallets firmly together.

Brief Description of the Drawings

[0026] Further characteristics and advantages of the present invention will appear more evident from the description of a preferred, but not exclusive, embodiment of a station for carrying out the process of wrapping palletised loads according to the invention, illustrated by way of non limiting example in the accompanying drawings, wherein:

figure 1 is a plan view of the wrapping station for carrying out the process according to the invention;
figure 2 is an elevated side view, schematic and partial, of the station of figure 1;
figure 3 is an elevated side view, on an enlarged scale, of a detail of the station of figure 1 at the beginning of the wrapping phase;
figure 4 is an elevated side view, on a further enlarged scale, of a detail of the palletised loads at the end of wrapping carried out with the process according to the invention.

Embodiments of the Invention

[0027] With special reference to such figures, by 1 has been globally designated a wrapping station suitable for wrapping a first palletised load 2 together with a second palletised load 3 with a covering sheet 4.

[0028] The first and the second palletised loads 2 and 3 are composed respectively of a first load to wrap 2a and of a second load to wrap 3a located on a first pallet 2b and on a second pallet 3b respectively.

[0029] The pallets 2b and 3b consist of two demi-pallets of a standardised shape and size.

[0030] The wrapping station 1 has an outer wall 5 that delimits a work area 6.

[0031] In the work area 6 there are a first feeding line 7 for introducing the palletised loads 2 and 3 in the work area 6, a rotating platform 8 for rotating the palletised loads 2 and 3, a second feeding line 9 for moving the palletised loads 2 and 3 away from the rotating platform 8 and their exit from the work area 6, and a machine 10 arranged close to the rotating platform 8 and suitable for moving a wrapping head 11.

[0032] The first and the second feeding lines 7 and 9 consist of corresponding roller conveyors arranged upstream and downstream respectively the rotating platform 8 which, in turn, is composed of its own roller conveyor 8a fitted onto a base 8b that can rotate around a vertical axis.

[0033] The machine 10 consists of a jointed robot arm at the free end of which the wrapping head 11 is mounted.

[0034] The jointed robot arm 10, in effect, is suitable for working together with the rotating platform 8 to move the wrapping head 11 in a vertical direction so the covering sheet 4 can be wound around the palletised loads 2 and 3 which rotate on the rotating platform 8.

[0035] The wrapping head 11 supports a dispensing reel 12 of the covering sheet 4 that, while the palletised loads 2 and 3 are being wrapped, is kept substantially vertical.

[0036] The wrapping head 11 has also means 13 suitable for rolling up the bottom longitudinal edge 4a of the covering sheet 4 on itself which unwinds from the dispensing reel 12.

[0037] The means 13, e.g., consist of a wheel movable vertically between a move away configuration from the bottom longitudinal edge 4a (figure 2), wherein the covering sheet 4 unwinds from the dispensing reel 12 without folds, and a close up configuration (figure 3), wherein the wheel 13 is in contact against the bottom longitudinal edge 4a and keeps it raised.

[0038] In the close up configuration, in effect, the wheel 13 causes the bottom longitudinal edge 4a to roll up on itself so as to form a particularly resistant reinforcement border 14.

[0039] Usefully, the wrapping of the palletised loads 2 and 3 inside the wrapping station 1 is carried out by the process according to the invention with consists of the following steps:

- supplying the first palletised load 2 on the first feeding line 7;
- supplying the second palletised load 3 on the first feeding line 7 following the first palletised load 2;
- positioning the first and the second palletised loads 2 and 3 in a wrapping configuration wherein the first and the second pallets 2b and 3b are substantially side by side and approached one against the other on the rotating platform 8;
- winding several times the covering sheet 4 around the first and the second palletised loads 2 and 3 so as to tighten the reinforcement border 14 around the first and the second pallets 2b and 3b to form a plurality of turns to hold the pallets one against the other.

[0040] Usefully, the total width of the covering sheet 4, that is, the distance between the bottom longitudinal edge 4a and the top longitudinal edge 4b, is more than 600 mm and, preferably, is equal to 1000 mm.

[0041] Alternatively, the total width of the covering sheet can be equal to about 750 mm.

[0042] The width of the covering sheet 4 dedicated to forming the reinforcement border 14, instead, is comprised between 100 mm and 300 mm and, preferably, is equal to 200 mm.

[0043] This means that the remaining width of the covering sheet 4, that is, the part that extends from the top longitudinal edge 4b to the reinforcement border 14, is sufficiently wide to allow the winding of the base of the loads to wrap 2a and 3a together with the pallets 2b and 3b.

[0044] Such dimensioning, then, helps stabilise the loads to wrap 2a and 3a on top of the pallets 2b and 3b.

[0045] It should also be noted that the turns tightened around the pallets 2b and 3b make the pallets 2b and 3b practically integral with each other, conferring the necessary stability and rigidity to the palletised loads 2 and 3 for being transported without being put on an auxiliary pallet which is what happens at the current state of the art.

[0046] The number of turns tightened around the pallets 2b and 3b, corresponding to the number of windings of the covering sheet 4 around the base of the loads to wrap 2a and 3a, may vary according to the type of loads themselves.

[0047] Generally speaking, the number of turns and windings must be more than or at least equal to 3.

[0048] If, for instance, the loads to wrap 2a and 3a consist of loose products, not bound together, then the winding phase provided by this invention has the aim of not only joining the pallets 2b and 3b integrally with each other but also of stabilising the loads to wrap 2a and 3a on top of them; in such a situation therefore, the number of turns and windings must be comprised between 6 and 8.

[0049] Alternatively, the formation of a lower number of turns, e.g. variable between 4 and 5, is envisaged if each palletised load 2 and 3 has already been stabilised by the application of a cap, a wrapping or the like before being positioned on the rotating platform 8.

[0050] In this regard the fact is underlined that this process also envisages a preliminary wrapping phase of the palletised loads 2 and 3 with a covering film. In this preliminary phase each load to wrap 2a and 3a is stabilised individually with its corresponding pallet 2b and 3b prior to the above mentioned positioning phase on the rotating platform 8 and winding phase with the covering sheet 4. In a first embodiment of this invention, e.g., this preliminary phase is carried out in a prewrapping station which is structurally and functionally identical to the wrapping station 1 and is not, therefore, illustrated in detail in the figures.

[0051] The prewrapping station is located upstream the wrapping station 1 and the palletised loads 2 and 3 are inside it before going on to the first feeding line 7 of the wrapping station 1.

[0052] The covering film applied in the prewrapping station can be identical to the covering sheet 4 used inside the wrapping station 1 or, alternatively, it can be of a different material, colour and type.

[0053] In a second embodiment of the process according to the invention on the other hand, there is no prewrapping station and the preliminary wrapping phase of the palletised loads 2 and 3 is carried out inside the wrapping station 1.

[0054] In this case, the covering film used to wrap the palletised loads 2 and 3 individually is made of the same covering sheet 4 used to wind the palletised loads 2 and 3 one against the other.

[0055] In this second embodiment of the invention, the first palletised load 2, not yet wrapped, is moved inside the wrapping station 1 along the first feeding line 7, it is placed on the rotating platform 8, it is wrapped with the covering film dispensed by-the wrapping head 11 and then transferred momentarily to the second feeding line 9.

[0056] Subsequently, the rotating platform 8 is engaged by the second palletised load 3 which is also coming from the first feeding line 7.

[0057] The second palletised load 3 is covered with a stabilising layer on the rotating platform 8.

[0058] At this point, the first and the second palletised loads 2 and 3, both wrapped individually, can be positioned in the wrapping configuration on the rotating platform 8 to be wound, one against the other, in the way described previously. It has in practice been found how the described invention achieves the intended objects.

[0059] The invention thus conceived is susceptible of numerous modifications and variations, all of which falling within the scope of the inventive concept. Furthermore all the details may be replaced by other elements which are technically equivalent.

[0060] In practice, 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, comprising the following steps:

   supplying at least one first palletised load (2) with one first load (2a) to wrap placed on top of a first pallet (2b);
   - supplying at least one second palletised load (3) with one second load (3a) to wrap placed on top of a second pallet (3b);
   - positioning said first and second palletised loads in a wrapping configuration wherein said first and second pallets are substantially side by

side and approached inside a wrapping station (1) **characterised in that** said wrapping station is suitable for wrapping said palletised loads with a covering sheet (4) that has at least one longitudinal edge (4a) substantially rolled up on itself to form a reinforcement border; and in the steps of

- winding at least once the covering sheet around said first and second palletised loads (2, 3) in said wrapping configuration, tightening said palletised loads (2, 3) in said wrapping configuration, tightening said reinforcement border around said first and second pallets (2a, 3a) to form at least one turn to hold the pallets firmly together.

2. Process according to claim 1, **characterized in that** said winding comprises forming a plurality of said turns.

3. Process according to one or more of the preceding claims, **characterized in that** said winding comprises forming a number of said turns variable between 4 and 5.

4. Process according to one or more of the preceding claims, **characterized in that** said winding comprises forming a number of said turns variable between 6 and 8.

5. Process according to one or more of the preceding claims, **characterized in that** the total width of said covering sheet is substantially more than 600 mm.

6. Process according to one or more of the preceding claims, **characterized in that** the total width of said covering sheet is substantially equal to 750 mm.

7. Process according to one or more of the preceding claims, **characterized in that** the total width of said covering sheet is substantially equal to 1000 mm.

8. Process according to one or more of the preceding claims, **characterized in that** the width of said covering sheet dedicated to forming said reinforcement border is substantially comprised between 100 mm and 300 mm.

9. Process according to one or more of the preceding claims, **characterized in that** the width of said covering sheet dedicated to forming said reinforcement border is substantially equal to 200 mm.

10. Process according to one or more of the preceding claims, **characterized in that** at least one between said first and second pallet is of the "demi-pallet" type.

11. Process according to one or more of the preceding claims, **characterized in that** it comprises wrapping at least one between said first palletised load and said second palletised load with at least one covering film before said positioning.

12. Process according to one or more of the preceding claims, **characterized in that** said wrapping comprises placing at least one between said first palletised load and said second palletised load on a prewrapping station.

13. Process according to one or more of the preceding claims, **characterized in that** said wrapping comprises placing at least one between said first palletised load and said second palletised load on said wrapping station.

14. Process according to one or more of the preceding claims, **characterized in that** said covering film is made of said covering sheet.

Patentansprüche

1. Verfahren zum Einwickeln von palettierten Lasten, aufweisen folgende Schritte:

Bereitstellen mindestens einer ersten palettierten Last (2) mit einer ersten einzuwickelnden Last (2a), die auf einer ersten Palette (2b) platziert ist;
Bereitstellen mindestens einer zweiten palettierten Last (3) mit einer zweiten einzuwickelnden Last (3a), die auf einer zweiten Palette (3b) platziert ist;
Positionieren der ersten und der zweiten palettierten Last in einer Einwickelkonfiguration, bei der die erste und die zweite Palette sich im Wesentlichen Seite an Seite befinden und innerhalb einer Einwickelstation (1) angefahren werden, **dadurch gekennzeichnet, dass** die Einwickelstation für das Einwickeln der palettierten Lasten mit einer Hüllfolie (4), die mindestens eine Längskante (4a) besitzt, die zur Bildung eines Verstärkungsrandes im Wesentlichen um sich selbst ausgerollt ist, geeignet ist; und die Schritte
mindestens einmaliges Wickeln der Hüllfolie um die erste und die zweite palettierte Last (2, 3) in der Einwickelkonfiguration, Spannen des Verstärkungsrandes um die erste und die zweite Palette (2a, 3a), um mindestens eine Windung zu bilden mit dem Ziel, die Paletten fest zusammenzuhalten.

2. Verfahren gemäß Anspruch 1, **dadurch gekennzeichnet, dass** das Wickel das Bilden einer Vielzahl

der Windungen aufweist.

3. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** das Wickeln das Bilden einer zwischen 4 rund 5 variablen Anzahl der Windungen aufweist.

4. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** das Wickeln das Bilden einer zwischen 6 und 8 variablen Anzahl der Windungen aufweist.

5. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die gesamte Breite der Hüllfolie im Wesentlichen mehr als 600 mm beträgt.

6. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die gesamte Breite der Hüllfolie im Wesentlichen gleich 750 mm ist.

7. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die gesamte Breite der Hüllfolie im Wesentlichen gleich 1000 mm ist.

8. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Breite der Hüllfolie, die für das Bilden des Verstärkungsrandes bestimmt ist, im Wesentlichen zwischen 100 mm und 300 mm liegt.

9. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Breite der Hüllfolie, die für das Bilden des Verstärkungsrandes bestimmt ist, im Wesentlichen gleich 200 mm ist.

10. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** mindestens die erste oder die zweite Palette vom Typ "Halbpalette" ist.

11. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** es das Einwickeln mindestens der ersten palettierten Last oder der zweiten palettierten Last mit mindestens einem Hüllfilm vor dem Positionieren aufweist.

12. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** das Einwickeln das Platzieren mindestens der ersten palettierten Last oder der zweiten palettierten Last auf einer Voreinwickelstation aufweist.

13. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** das Einwickeln das Platzieren mindestens der ersten palettierten Last oder der zweiten palettierten Last auf der Einwickelstation aufweist.

14. Verfahren gemäß einem oder mehr der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** der Hüllfilm aus der Hüllfolie hergestellt ist.

Revendications

1. Procédé pour l'emballage de chargements palettisés, comprenant les étapes suivantes :

- fournir au moins un premier chargement palettisé (2) pourvu d'un premier chargement (2a) qu'il faut emballer logé sur une première palette de manutention (2b) ;
- fournir au moins un deuxième chargement palettisé (3) pourvu d'un deuxième chargement (3a) qu'il faut emballer sur une deuxième palette de manutention (3b) ;
- logeur lesdits premier et deuxième chargements palettisés dans une configuration d'emballage dans laquelle lesdites première et deuxième palettes de manutention sont sensiblement côte à côte et approchées à l'intérieur d'une station d'emballage (1) ***caractérisé en ce que*** ladite station d'emballage est apte à emballer lesdits chargements palettisés avec une feuille d'emballage (4) qui est pourvue d'au moins un bord longitudinal (4a) sensiblement replié sur lui-même de façon à former un ourlet de renforcement ; et dans les étapes d'enroulement de la feuille de couverture au moins une fois autour desdits premier et deuxième chargements palettisés (2, 3) dans ladite configuration d'emballage en serrant ledit ourlet de renforcement autour desdites première et deuxième palettes de manutention (2a, 3a) de façon à former au moins une spire pour tenir les deux palettes bien serrées entre elles.

2. Procédé selon la revendication 1, ***caractérisé en ce que*** ledit enroulement comprend une pluralité de spires.

3. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce que*** ledit enroulement comprend la formation d'un nombre desdites spires variable entre 4 et 5.

4. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce que*** ledit enroulement comprend la formation d'un nombre desdites spires variable entre 6 et 8.

5. Procédé selon l'une ou plusieurs des revendications

précédentes, ***caractérisé en ce que*** la largeur totale de ladite feuille de couverture est sensiblement majeure de 600 mm.

6. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce que*** la largeur totale de ladite feuille de couverture est sensiblement égale à 750 mm.

7. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce que*** la largeur totale de ladite feuille de couverture est sensiblement égale à 1000 mm.

8. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce que*** la largeur de ladite feuille de couverture dédiée à la formation dudit ourlet de renforcement est sensiblement comprise entre 100 mm et 300 mm.

9. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce que*** la largeur de ladite feuille de couverture dédiée à la formation dudit ourlet de renforcement est sensiblement égale à 200 mm.

10. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce que*** au moins une desdites première et deuxième palettes de manutention est du type « demi-palette ».

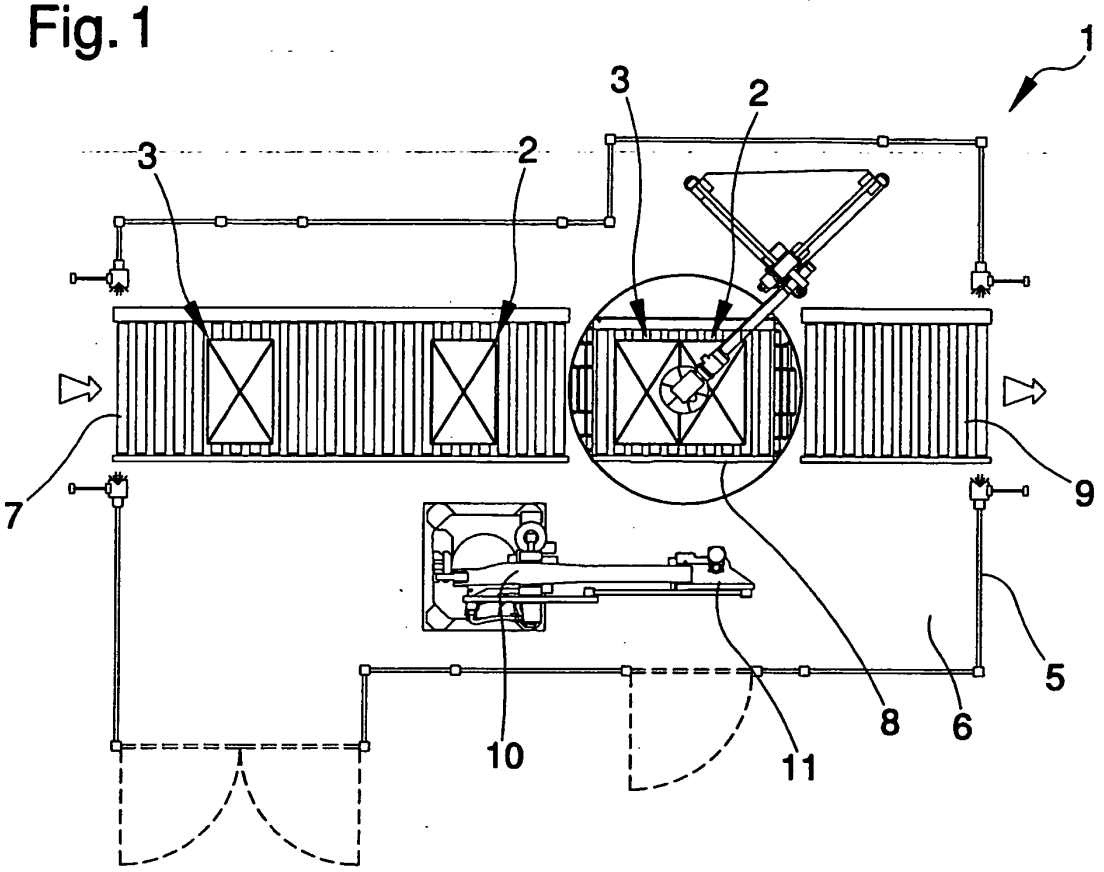
11. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce*** **qu'**il comprend l'emballage d'au moins un entre ledit premier chargement palettisé et ledit deuxième chargement palettisé avec au moins un film de revêtement avant ledit positionnement.

12. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce que*** ledit emballage comprend le positionnement d'au moins un entre ledit premier chargement palettisé et ledit deuxième chargement palettisé sur une station de préemballage.

13. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce*** **que** ledit emballage comprend le positionnement d'au moins un entre ledit premier chargement palettisé et ledit deuxième chargement palettisé sur ladite station d'emballage.

14. Procédé selon l'une ou plusieurs des revendications précédentes, ***caractérisé en ce que*** ledit film de revêtement est formé par lesdites feuilles de couverture.

Fig. 1



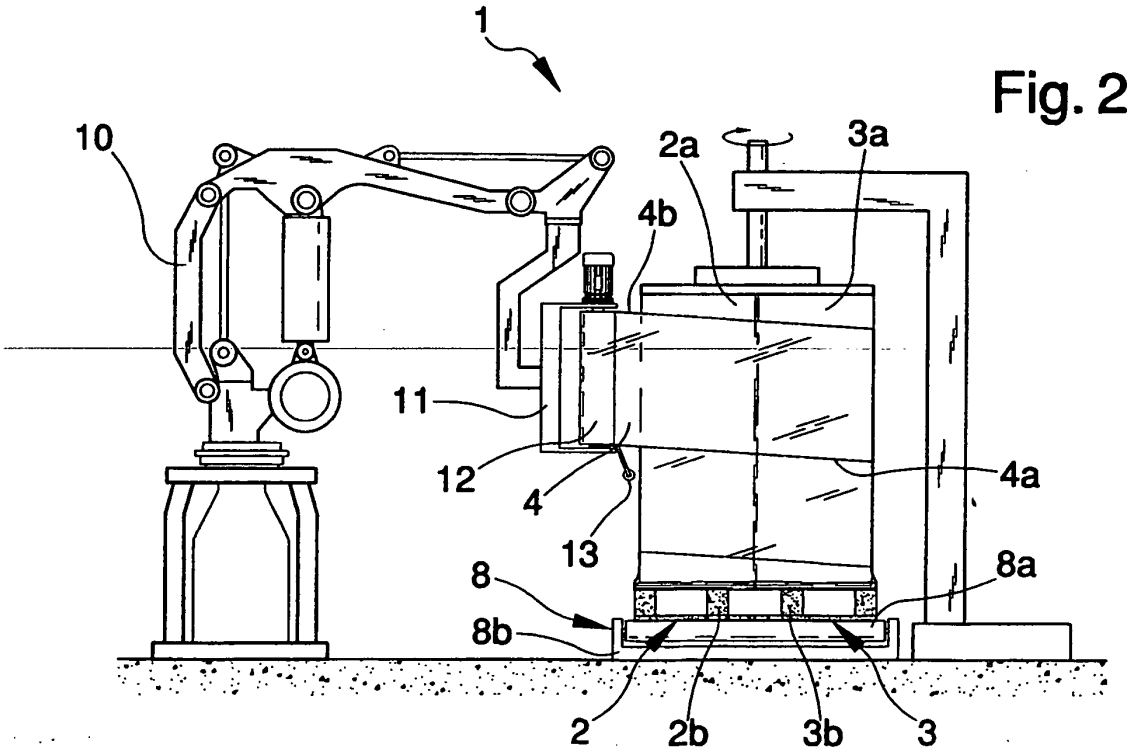


Fig. 2

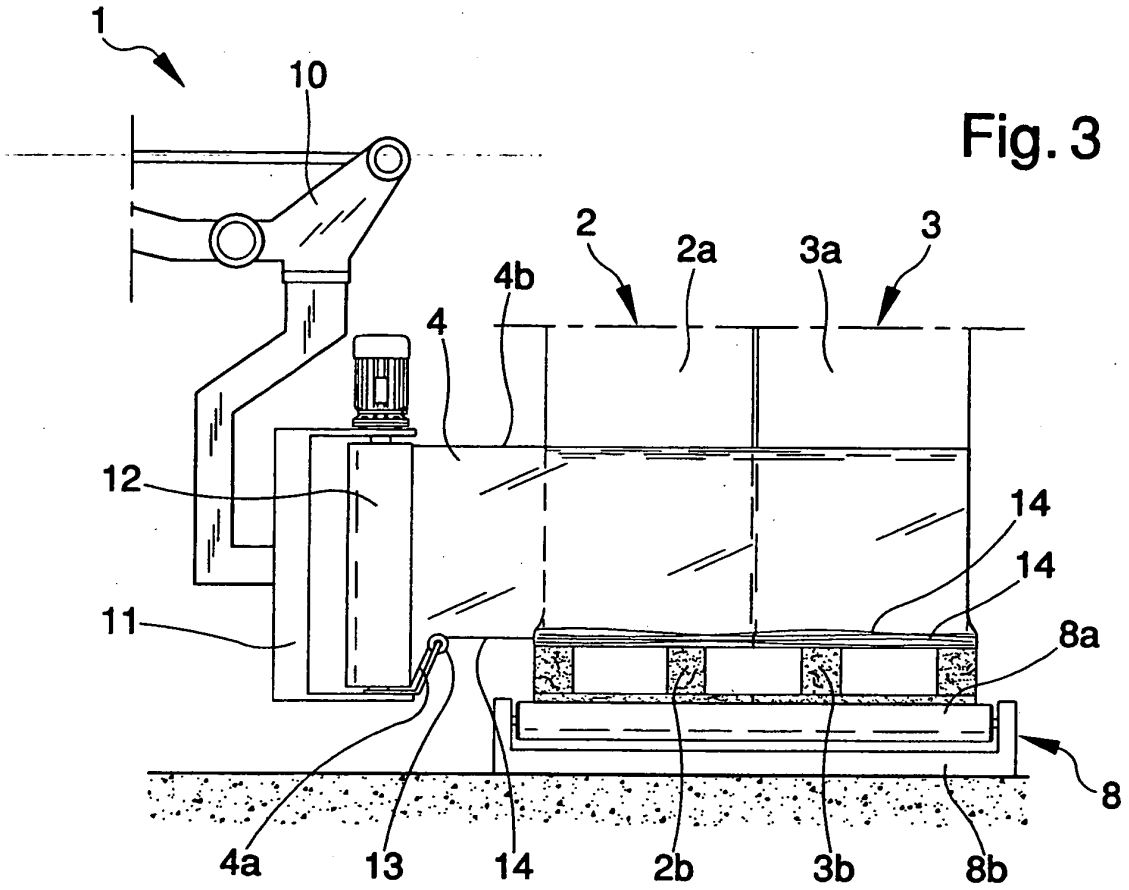

1
10
2
2a
3a
3
4b
4
12
14
14
11
8a
8
4a
13
14
2b
3b
8b

Fig. 3

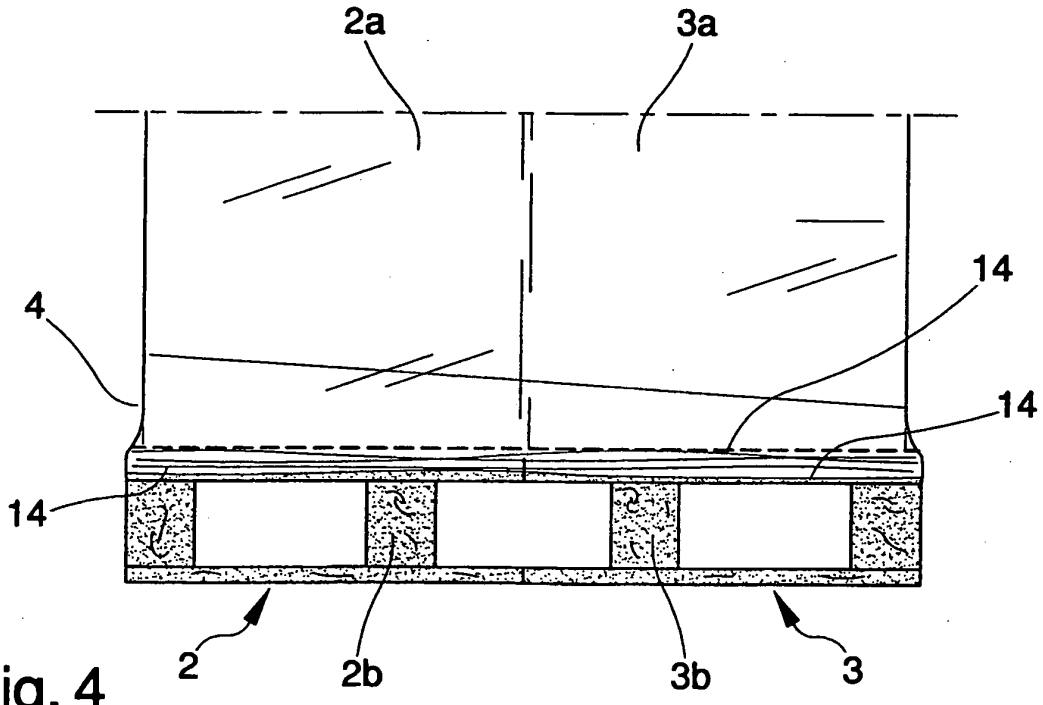

2a
3a
14
4
14
14
2
2b
3b
3

Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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