

(19)



(11)

EP 2 392 513 B2

(12)

NEW EUROPEAN PATENT SPECIFICATION

After opposition procedure

(45) Date of publication and mention
of the opposition decision:
13.01.2021 Bulletin 2021/02

(51) Int Cl.:
B65B 9/02 ^(2006.01) **B65B 59/00** ^(2006.01)
B65B 53/02 ^(2006.01) **B65B 65/00** ^(2006.01)

(45) Mention of the grant of the patent:
19.08.2015 Bulletin 2015/34

(21) Application number: **11164515.6**

(22) Date of filing: **03.05.2011**

(54) **Plant and method for lateral wrapping of products by means of plastic film**

Anlage und Verfahren zum seitlichen Einwickeln von Produkten mit einer Kunststoffolie

Installation et procédé pour l'emballage latéral de produits au moyen d'un film plastique

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

(30) Priority: **25.05.2010 IT MI20100937**

(43) Date of publication of application:
07.12.2011 Bulletin 2011/49

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(56) References cited:
**EP-A1- 0 183 676 FR-A1- 2 606 366
FR-A1- 2 869 293 US-A1- 2006 096 244**

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Description

[0001] The present invention relates to a plant and a method for lateral wrapping of products by means of plastic film, advantageously of the heat-shrinkable type.

[0002] Among the plants for performing wrapping with plastic film known from the prior art there are those which comprise a wrapping station (sometimes referred to as "curtain" stations) in which a strip of film is stretched, in a vertical plane, transverse to the direction of movement of the product in the station. The product thus comes into contact with the strip and draws it along until it is partially wrapped by it. A pair of vertical blades are then operated in order to close the strip behind the product, weld its edges and cut it. The strip is then joined together again behind the wrapped product, so that it is ready to wrap the next product. In the case of heat-shrinkable film, the wrapped product is conveyed to a heat-shrinking station in order to complete the packing process. Since the height of the strip is related to the height of the product to be packaged (usually the strip must be folded over by a small, but not excessive amount onto the top and bottom faces of the product), in the case where it is required to package products of different height, separate packaging lines are required, i.e. one for each height, with not insignificant costs and dimensions. Alternatively, if the changes are occasional, it is possible to use only one line, enduring a somewhat long line stoppage in order to replace rolls of film with those having a new height. The same problems occur if it is required to wrap the products with different types of film.

[0003] EP 0,183,676 describes a plant formed by a single station having a plurality of wrapping units. Each unit comprises two reels which are already joined together and spaced so as to form the strip of transverse film. The units are movable so that they may be inserted, from the top or from one side, transversely with respect to the product conveying line so as to replace each other inside the station at the location of cutting and welding systems which form the package in the station. The system is, however, complex and not flexible, not allowing the easy addition of other types of film.

[0004] Document EP0183676A discloses a plant according to the preamble of claim 1.

[0005] The general object of the present invention is to provide a plant which allows the simultaneous management of different types of film rapidly and efficiently, for example in order to wrap products which have a different height or which in any case require one of such different types of film.

[0006] In view of this object, the idea according to the present invention is to provide a plant as claimed in Claim 1.

[0007] Still according to the principles of the invention, the idea is that of providing a method for the lateral wrapping, using plastic film, of products which travel along a conveying line, comprising the steps of arranging along the line a series of lateral-wrapping stations, each de-

signed to wrap products with a predetermined film stretched transversely with respect to the conveying line, and causing the products to pass through all the stations, raising above a passing product the film in the stations which are not equipped with the film required for that product and lowering the film in front of the product in a station equipped for wrapping that product with the desired film.

[0008] Still according to the principles of the invention, the idea is that of providing a station (not claimed) for lateral wrapping of products by means of plastic film, able to be passed through by a line for conveying the products in sequence and comprising a wrapping system formed by two vertical-axis rolls of film which are arranged on opposite sides so as to dispense transversely with respect to the line a strip of film stretched between the rolls, the station also comprising vertical welding blades which are located opposite each other on the two sides of the line, said blades being movable towards each other for welding and cutting the strip of film around a product made to pass through the station and against the transverse strip, characterized in that the rolls are supported in the station so as to be movable vertically in a controllable manner for displacement between a lowered operative position for wrapping a product passing through the station and a raised non-operative position for allowing a product to pass through the station without coming into contact with the transverse strip.

[0009] In order to illustrate more clearly the innovative principles of the present invention and its advantages compared to the prior art, an example of embodiment applying these principles will be described below, with the aid of the accompanying drawings. In the drawings:

- Figures 1 and 2 show schematic side elevation views of a plant according to the invention;
- Figures 3, 4 and 5 show a schematic side elevation, plan and front view, respectively, of a packaging station according to the invention;
- Figure 6 shows a view, similar to that of Figure 3, but with the station in a different condition.

[0010] With reference to the figures, Figure 1 shows a plant, denoted generally by 10, for wrapping products by means of plastic film.

[0011] The plant 10 comprises a line 11 for conveying in sequence products 12 to be wrapped with film. The products may be formed by packs of material arranged on a pallet so as to form a parallelepiped. For example, the packs may consist of bricks, paper-mill products, etc.

[0012] The conveying line is essentially of the known type and therefore will not be described or shown here in detail. It generally comprises a support surface on which the products are placed in order to be conveyed through the plant between a loading zone and an unloading zone. The line may advantageously be formed, for example, by means of a belt or chain conveyor.

[0013] The conveying line 10 passes in sequence through vertical-wrapping stations 13 which are arranged along the line. As will be described in greater detail below, each station has a "curtain" type system for performing lateral wrapping of a product 12 which passes through the station. The wrapping system 14 has a strip of film 25 which is arranged transverse to the line so as to wrap a product which passes through the station. The wrapping systems 14 are motor-driven so as to be movable vertically in a controllable manner for displacement between a lowered operative position (such as that shown for the first left-hand station in Figure 1) for wrapping a passing product in the station and a raised non-operative position (such as that shown for the other stations in Figure 1) for allowing a product to pass through the station without coming into contact with the strip of film.

[0014] Advantageously an overhead conveyor 15 (for example with a travel path 16 along which a shuttle 17 moves) is provided above the stations for conveying rolls of replacement film 19 to the stations. The conveyor moves advantageously above and along the product conveying line, making use of the space above the stations. As will become clear below, with a plant with stations having a structure according to the present invention it is possible to minimize the space occupied in the vertical direction by the stations when the replacement reels must pass through. As a result the plant may be used with the overhead conveyor also in the case of a room with a low height, unlike other known solutions.

[0015] Advantageously, the plant 10 comprises means 19 for controlling the plant which control operation of the plant and in particular the vertical displacement of the wrapping system of each station so as to select the station which must wrap the film around a product passing on the line. The control means 19 (for example a known electronic system with a suitably programmed microcontroller) is able to receive selection commands from an operator or from a system for electronic detection of the arriving product.

[0016] In particular, in the case where the stations are each equipped with a film suitable for a different product height or height range, a sensor 20 may be provided ahead of the series of stations 13 in order to detect the height of the arriving product, said sensor sending this height information to the control means 19 which are thus able to decide which station contains the most suitable film for wrapping the particular product and consequently lower only the film of this station, allowing the product to pass freely through the other stations.

[0017] By way of example, Figure 1 shows the plant upon arrival of a product with a height suitable for processing by the first station, while Figure 2 shows the plant upon arrival of a product with a height suitable for processing by the third station along the line. Advantageously the film used by the plant is of the heat-shrinkable type. In this case, the conveying line 11, after the wrapping stations, reaches or passes through a known heat-shrinking station 21.

[0018] In order to form the system for lateral wrapping of the products, each station comprises two rolls of film 22 which are supported on their vertical axis and arranged on opposite sides of the conveying line. The portions of film which are unwound from the two rolls of the station are joined together to form the strip of film which is stretched transversely with respect to the conveying line. In this way, when the rolls are in the lowered position, the product comes into contact with the transverse strip of film and continuing its travel draws the film along with it and is partially wrapped on the sides. Vertical welding blades 23 are arranged opposite each other on the two sides of the line and are movable towards each other for cutting and welding the strip of film around the product which passes through the station. During their movement towards each other the blades weld the film onto the rear part of the product (thus closing it around the product), cut the wound film and join together again the two portions in order to form again the transverse strip for wrapping the next product.

[0019] Figures 3 to 6 show in greater detail an advantageous structure of a station 13 according to the invention and designed to be passed through by the line 11 for conveying the products in sequence.

[0020] As can be clearly seen in Figures 4 and 5, the station for forming the wrapping system 14 comprises two rolls of film 22 which are rotatably supported by their vertical axis 24 and arranged on opposite sides of the conveying lines so as to dispense transversely with respect to the line the strip of film 25 stretched between the rolls.

[0021] Each roll is supported by a motor-driven carriage 26 which travels vertically along lateral uprights 25 which form part of the fixed structure of the station. Preferably, the two carriages are driven by a same electric motor 28 via a suitable known mechanism so as to move in synchronism during their travel upwards and downwards between the said operative and non-operative positions.

[0022] As can be clearly seen in Figure 6, where the carriage is shown in a position close to the highest position, the carriages are arranged close to the base of the rolls in order to support the respective roll in a projecting manner, for example by means of a bottom bracket 29 and a top bracket 30, if present, which may be provided in order to stabilize the axis 24 of rotation of the roll. The carriages may thus raise the rolls with their top end above the top end of the lateral uprights. This allows the height of the stations to be reduced when the rolls are in the lowered position, while allowing good elevation of the rolls above the passing products. This is particularly advantageous for allowing the passage of the overhead conveyor of the roll replacement system.

[0023] It should be noted that, when the film has been used up, the overhead conveyor, if arranged in the centre of the product conveying line, may thus pass between the empty rolls even when the carriages are in their completely raised position.

[0024] Still advantageously, the top arm for supporting the axis of the roll may project from a support 31 which may be released in relation to the carriage so that it can be adjusted heightwise, in order to allow rapid adaptation of the station to a change in height of the film (i.e. the width of the film in a direction transverse to the strip which is unrolled) being processed by it. In this way, it is also possible to provide stations which are all identical and adapt them to process a given film format depending on the specific requirements of the plant, also with any desired order of the various heights of film along the line.

[0025] Advantageously, known mechanisms 32 for guiding and tensioning the film may also be provided, coupled to each carriage.

[0026] As already mentioned above, the station also comprises vertical blades 23 located opposite each other on both sides of the line. These blades, which are advantageously arranged on the opposite side of the uprights with respect to the carriages for raising the film, comprise a known controlled-heating electric circuit for welding the portions of film which are brought into contact when the blades are closed towards each other, as shown schematically in broken lines in Figure 4, after the product has passed through.

[0027] Advantageously, the structure of the station comprises a cross beam 33 between the uprights, along which the cutting and welding blades 23 travel in a controllable manner (by means of a motor 34 with a suitable known drive system) so as to move between the spaced apart non-operative position (shown in solid lines in Figure 5) for allowing the passage of a product and the operative position close to each other (shown in broken lines in Figure 5) for welding the film folded around the product and held between the blades.

[0028] According to the method of the invention, firstly a series of lateral wrapping stations are arranged along a conveying line, each being designed to wrap the products with a predetermined film stretched transversely with respect to the conveying line. Then the products are made to pass through all the stations, raising above a passing product the film in the stations which are not equipped with the desired film for that product and lowering the film in front of the product in a station equipped to wrap that product with the desired film. In this way rapid and efficient processing of products which require different films may be easily achieved, using a minimum amount of space and with a minimum complexity of the plant.

[0029] At this point it is clear how the predefined objects are achieved with a plant according to the invention which offers a high degree of flexibility in operational terms, low format change-over times and small dimensions, also in the vertical direction. Stations may be easily used along lines which require a rapid throughput of products without interference. Moreover, the stations may be easily adapted to operate in sequence along conveying lines of different types, size and length, while still having a relatively low space requirement.

[0030] A method as described above for the lateral wrapping of products with plastic film results in a high degree of flexibility and the possibility of using simultaneously also a large number of different films.

[0031] Obviously, the above description of an embodiment applying the innovative principles of the present invention is provided by way of example of these innovative principles and must therefore not be regarded as limiting the scope of the rights claimed herein.

[0032] For example, the stations are advantageously each equipped with a film for wrapping a different product height or height range and the film in the stations is therefore lowered or raised depending on whether or not the product arriving at the station has a height for which the station is equipped.

[0033] However, other characteristic features of the film may be varied among the stations, depending on the specific packaging requirements. For example, it is possible to envisage films with different colours or different physical or chemical properties. With the plant according to the invention it is in any case possible to select rapidly the desired film for each specific type of product in arrival. Selection may be manual or performed by means of suitable automatic or semi-automatic devices, also depending on specific and predetermined characteristics which are detected in the arriving product.

[0034] The number of stations which can be used may obviously be of any number and different from that shown by way of example in the drawings. There is no limit to the number of stations which can be used in sequence along the conveying line. Moreover, although a substantially straight conveying line is preferable, other configurations may be envisaged, also in order to make use of spaces with a particular form and reduce the dimensions of the plant in certain directions.

Claims

1. Plant for lateral wrapping of products by means of plastic film, comprising a line for conveying the products in sequence and wrapping with different strips of film, comprising a plurality of vertical-wrapping stations arranged in sequence along the line, each station comprising a wrapping system (14) with a strip of film (25) arranged transverse to the line so as to wrap a product which passes through the station and vertical welding blades (23) which are arranged opposite each other on the two sides of the line and which are movable towards each other for cutting and welding the strip of film around a product which passes through the station and against the transverse strip, the wrapping systems (14) being movable vertically in a controllable manner for displacement between a lowered operative position for wrapping a product passing through the station and a raised non-operative position for allowing a product to pass through the station without coming into con-

tact with the transverse strip, control means (19) of the plant performing the vertical displacement of the wrapping systems (14) between the lowered operative position and the raised non-operative system so as to select the station which must wrap the film around a product passing along the line, the wrapping system (14) comprising two rolls of film (22) which are supported by their vertical axis and arranged on opposite sides of the conveying line and have portions of film which are unrolled from them and which are joined together to form a strip of film (25) stretched transversely with respect to the conveying line, **characterized by** the station comprising a structure with uprights (27) which are lateral with respect to the conveying line, the rolls (22) being supported by means of motor-driven carriages (26) which travel vertically along the lateral uprights so as to move the rolls between the said operative position and non-operative positions, and the carriages (26) are arranged close to the base of the rolls in order to be able to raise the rolls with their top end above the lateral uprights.

2. Plant according to Claim 1, **characterized in that** the structure comprises a cross beam (33) between the uprights (27), along which the cutting and welding blades (23) travel in a controllable manner so as to move between a spaced apart non-operative position for allowing the passage of a product and an operative position close together for welding the film held between the blades.
3. Plant according to Claim 1, **characterized in that** each station is equipped with a film of different height so that each station is suitable for wrapping products with a correspondingly different height or height range.
4. Plant according to Claim 1, **characterized in that** the film is heat-shrinkable and the conveying line, after the wrapping station, reaches or passes through a heat-shrinking station (21).
5. Plant according to Claim 1, **characterized in that** a sensor (20) is present along the conveying line, ahead of the first of the plurality of stations, said sensor detecting the height of a product arriving along the line and being connected to the control means in order to perform the selection of the station from the plurality of stations depending on said height detected.
6. Plant according to Claim 1, **characterized in that** an overhead conveyor (15) for conveying replacement rolls to the stations is arranged above the stations.
7. Method for the lateral wrapping, using plastic film, of

products by means a plant according to claim 1, which travel along a conveying line, comprising the steps of arranging along the line a series of stations for lateral wrapping and welding of the film, each designed to wrap the products with a predetermined strip of film stretched transversely with respect to the conveying line and to cut and weld the strip of film around a product which passes through the station and against the strip, and causing the products to pass through all the stations, raising above a passing product the film in the stations which are not equipped with the film required for that product and lowering the film in front of the product in a station equipped for wrapping that product with the desired film.

8. Method according to Claim 7. wherein the stations are each equipped with a film for wrapping a different product height or height range and the film in the stations is lowered or raised depending on whether or not the product arriving at the station has a height for which the station is equipped.

25 Patentansprüche

1. Anlage zum seitlichen Einwickeln von Produkten mittels einer Plastikfolie, aufweisend eine Linie zum Fördern der Produkte in Serie und Einwickeln mit verschiedenen Folienstreifen, aufweisend eine Vielzahl von Vertikaleinwickelstationen, die in Serie entlang einer Linie angeordnet sind, wobei jede Station aufweist:

ein Einwickelsystem (14) mit einem Folienstreifen (25), der quer zu der Linie angeordnet ist, um ein die Station passierendes Produkt einzuwickeln, und vertikale Schweißklingen (23), die an den beiden Seiten der Linie einander gegenüberliegend angeordnet sind, und die zum Abschneiden und Verschweißen der Folienstreifen um ein Produkt herum, das die Station passiert, und gegenüber dem querverlaufenden Streifen aufeinander zu bewegbar sind, wobei das Einwickelsystem (14) auf eine steuerbare Weise zum Bewegen zwischen einer abgesenkten Betriebsposition zum Einwickeln eines Produktes, das die Station passiert, und einer angehobenen Nicht-Betriebsposition, um es einem Produkt zu erlauben, die Station zu passieren, ohne in Kontakt mit dem querverlaufenden Streifen zu kommen, vertikal bewegbar ist, wobei Steuermittel (19) der Anlage die vertikale Bewegung des Einwickelsystems (14) zwischen der abgesenkten Betriebsposition und der angehobenen Nicht-Betriebsposition ausführen, um die

- Station auszuwählen, welche die Folie um ein Produkt wickeln muss, das die Linie passiert, wobei
- das Einwickelsystem (14) zwei Folienrollen (22) aufweist, die durch deren vertikale Achsen gestützt werden und an gegenüberliegenden Seiten der Förderlinie angeordnet sind, und die Folienabschnitte aufweisen, welche von diesen abgerollt und zusammengefügt sind, um einen Folienstreifen (25) auszubilden, der sich bezüglich der Förderlinie quer erstreckt,
- dadurch gekennzeichnet, dass**
- die Station einen Aufbau mit Pfosten (27) aufweist, welche bezüglich der Förderlinie seitlich angeordnet sind, wobei
- die Rollen (22) mittels motorantriebener Schlitten (26), die sich vertikal entlang der seitlichen Pfosten bewegen, gestützt werden, um die Rollen zwischen der Betriebsposition und der Nicht-Betriebsposition zu bewegen, und
- die Schlitten (26) nahe am Fußteil der Rollen angeordnet sind, um ein Anheben der Rollen mit ihrem oberen Ende über die seitlichen Pfosten zu ermöglichen.
2. Anlage gemäß Anspruch 1,
dadurch gekennzeichnet, dass
- der Aufbau einen Querbalken (33) zwischen den Pfosten (27) aufweist, entlang welchem die Schneide- und Schweißklingen (23) auf eine steuerbare Weise verfahren, um sich zwischen einer voneinander beabstandeten Nicht-Betriebsposition, um ein Passieren der Produkte zu erlauben, und einer nah beieinander liegenden Betriebsposition zu bewegen, zum Verschweißen der Folie, die zwischen den Klingen gehalten wird.
3. Anlage gemäß Anspruch 1,
dadurch gekennzeichnet, dass
- jede Station mit einer Folie von unterschiedlicher Höhe ausgestattet ist, sodass jede Station dazu geeignet ist, Produkte mit einer entsprechenden unterschiedlichen Höhe oder einem unterschiedlichen Höhenbereich einzuwickeln.
4. Anlage gemäß Anspruch 1,
dadurch gekennzeichnet, dass
- die Folie hitzeschrumpfbar ist und die Förderlinie, hinter der Einwickelstation, eine Hitzeschrumpfstation (21) erreicht oder passiert.
5. Anlage gemäß Anspruch 1,
dadurch gekennzeichnet, dass
- ein Sensor (20) entlang der Förderlinie vor der ersten der Vielzahl von Stationen vorhanden ist, wobei der Sensor die Höhe eines Produktes erfasst, das entlang der Linie eintrifft, und mit dem Steuermittel verbunden ist, um das Auswählen der Station aus der
- Vielzahl von Stationen in Abhängigkeit von der erfassten Höhe auszuführen.
6. Anlage gemäß Anspruch 1,
dadurch gekennzeichnet, dass
- ein Überkopfförderer (15) über den Stationen angeordnet ist, zum Fördern von Auswechselrollen zu den Stationen.
7. Verfahren zum seitlichen Einwickeln von Produkten, die entlang einer Förderlinie bewegt werden, mit Hilfe einer Anlage nach Anspruch 1 unter Verwendung einer Plastikfolie, aufweisend die Schritte:
- Anordnen einer Serie von Stationen zum seitlichen Wickeln und Verschweißen der Folie entlang der Linie, wobei jede dazu konstruiert ist, die Produkte mit einem vorbestimmten Folienstreifen einzuwickeln, der sich bezüglich der Förderlinie quer erstreckt, und zum Abschneiden und Verschweißen des Folienstreifens um ein Produkt, das die Station passiert, und sich gegen den Streifen bewegt, und
 - Bewirken, dass die Produkte alle Stationen passieren; Anheben der Folie über ein passierendes Produkt in den Stationen, welche nicht mit der benötigten Folie für dieses Produkt ausgestattet sind; und Absenken der Folie vor das Produkt, in einer Station, die zum Einwickeln dieses Produktes mit der vorgesehenen Folie ausgestattet ist.
8. Verfahren gemäß Anspruch 7, wobei
- jede Station mit einer Folie zum Umwickeln einer anderen Produkthöhe oder einem anderen Höhenbereich ausgestattet ist, und die Folie in den Stationen abgesenkt oder angehoben wird, in Abhängigkeit davon, ob das Produkt, das die Station erreicht, eine Höhe für diese aufweist, mit der die Station ausgestattet ist.

Revendications

1. Installation pour l'emballage latéral de produits au moyen d'un film plastique, comprenant une ligne pour le transport des produits en séquence et l'emballage avec différentes bandes de film, comprenant une pluralité de stations d'emballage vertical agencées en séquence le long de la ligne, chaque station comprenant un système d'emballage (14) avec une bande de film (25) agencée de manière transversale par rapport à la ligne afin d'emballer un produit qui passe par la station et des lames de soudage verticales (23) qui sont agencées à l'opposé l'une de l'autre sur les deux côtés de la ligne et qui sont mobiles l'une vers l'autre pour couper et souder la bande de film autour d'un produit qui passe par la station

- et contre la bande transversale, les systèmes d'emballage (14) étant verticalement mobiles d'une manière contrôlable pour le déplacement entre une position opérationnelle abaissée pour emballer un produit passant par la station et une position non opérationnelle levée pour permettre à un produit de passer par la station sans venir en contact avec la bande transversale, des moyens de commande (19) de l'installation réalisant le déplacement vertical des systèmes d'emballage (14) entre la position opérationnelle abaissée et le système non opérationnel levé afin de sélectionner la station qui doit enrouler le film autour d'un produit passant le long de la ligne, le système d'emballage (14) comprenant deux rouleaux de film (22) qui sont supportés par leur axe vertical et agencés sur les côtés opposés de la ligne de transport et ont des parties de film qui sont déroulées à partir de ces derniers et qui sont assemblées pour former une bande de film (25) étirée de manière transversale par rapport à la ligne de transport, **caractérisée par** la station qui comprend une structure avec des montants (27) qui sont latéraux par rapport à la ligne de transport, les rouleaux (22) étant supportés au moyen de chariots motorisés (26) qui se déplacent verticalement le long des montants latéraux afin de déplacer les rouleaux entre ladite position opérationnelle et la position non opérationnelle, et les chariots (26) sont agencés à proximité de la base des rouleaux afin de pouvoir lever les rouleaux avec leur extrémité supérieure au-dessus des montants latéraux.
2. Installation selon la revendication 1, **caractérisée en ce que** la structure comprend une poutre transversale (33) entre les montants (27), le long desquels les lames de coupe et de soudage (23) se déplacent d'une manière contrôlable afin de se déplacer entre une position non opérationnelle espacée pour permettre le passage d'un produit et une position opérationnelle proche pour souder le film maintenu entre les lames.
 3. Installation selon la revendication 1, **caractérisée en ce que** chaque station est équipée avec un film de différente hauteur de sorte que chaque station est appropriée pour emballer des produits avec une hauteur ou plage de hauteur proportionnellement différente.
 4. Installation selon la revendication 1, **caractérisée en ce que** le film est thermorétractable et la ligne de transport, après la station d'emballage, atteint ou passe par une station de rétraction thermique (21).
 5. Installation selon la revendication 1, **caractérisée en ce qu'un** capteur (20) est présent le long de la ligne de transport, devant la première station de la pluralité de stations, ledit capteur détectant la hauteur d'un produit arrivant le long de la ligne et étant raccordé aux moyens de commande afin de réaliser la sélection de la station parmi la pluralité de stations en fonction de ladite hauteur détectée.
 6. Installation selon la revendication 1, **caractérisée en ce qu'un** transporteur en hauteur (15) pour transporter des rouleaux de remplacement jusqu'aux stations, est agencé au-dessus des stations.
 7. Procédé pour l'emballage latéral, à l'aide de film plastique, de produits au moyen d'une installation selon la revendication 1, qui se déplacent le long d'une ligne de transport, comprenant les étapes consistant à agencer, le long de la ligne, une série de stations pour l'emballage latéral et le soudage du film, chacune conçue pour emballer des produits avec une bande prédéterminée de film étirée transversalement par rapport à la ligne de transport et pour couper et souder la bande de film autour d'un produit qui passe par la station et contre la bande, et amener les produits à passer par toutes les stations, lever, au-dessus d'un produit qui passe, le film dans les stations qui ne sont pas équipées avec le film requis pour ce produit et abaisser le film en face du produit dans une station équipée pour emballer ce produit avec le film souhaité.
 8. Procédé selon la revendication 7, dans lequel les stations sont chacune équipées avec un film pour emballer un produit avec une hauteur ou plage de hauteur différente et le film, dans les stations, est abaissé ou levé selon si le produit qui arrive dans la station a une hauteur pour laquelle la station est équipée ou pas.

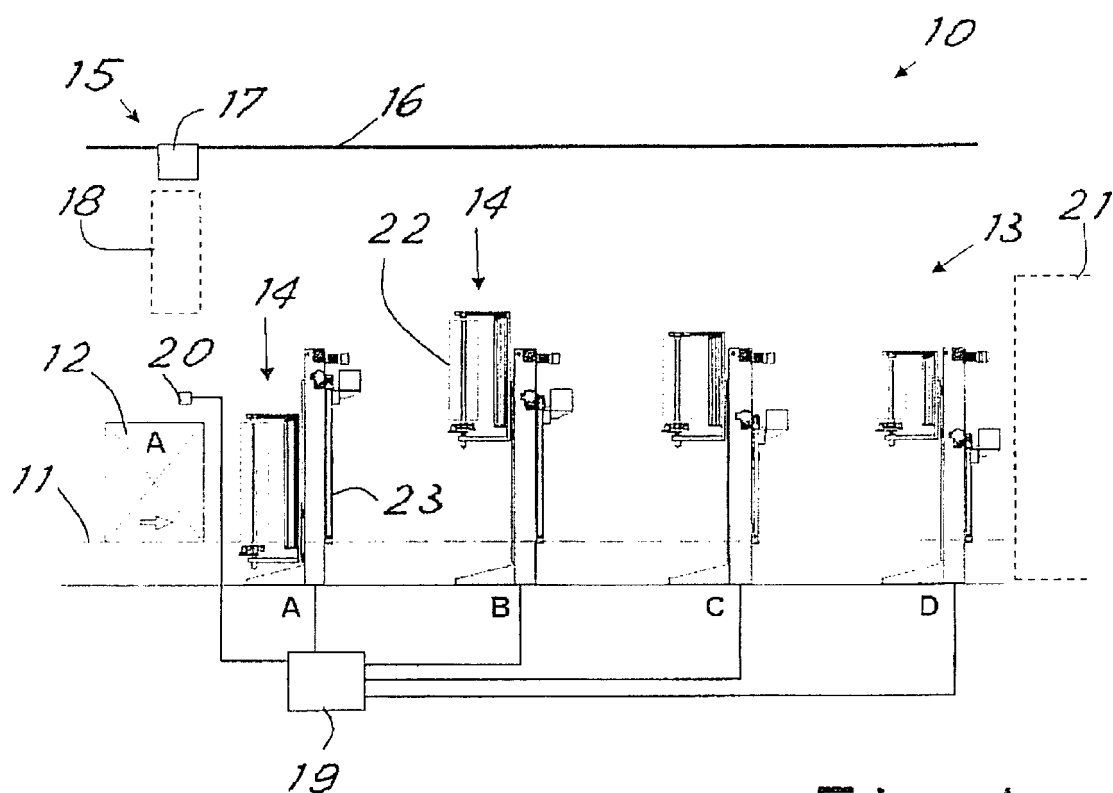


Fig.1

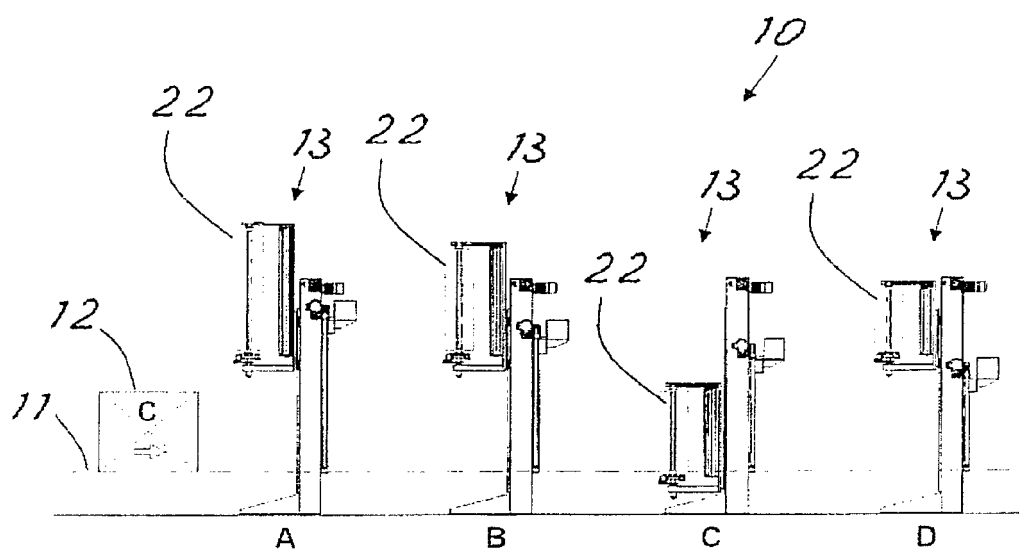


Fig.2

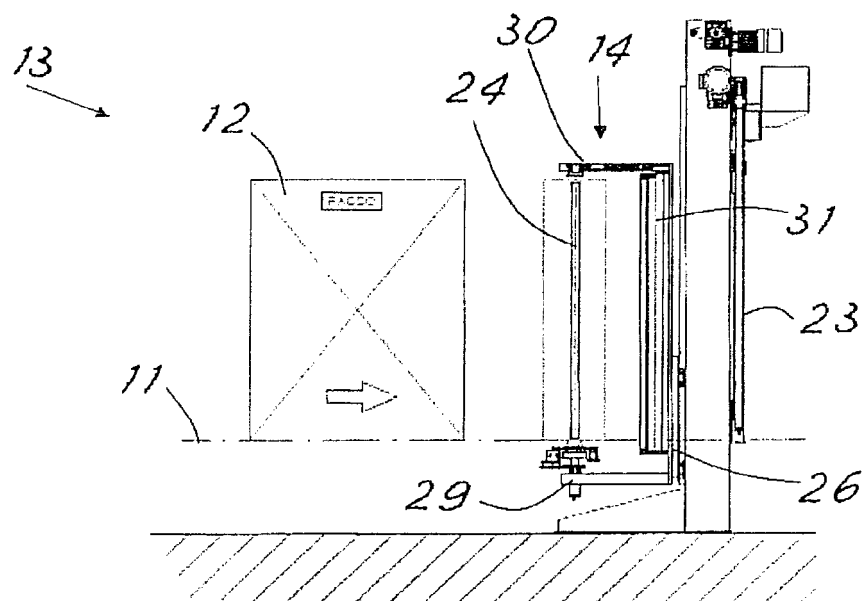


Fig.3

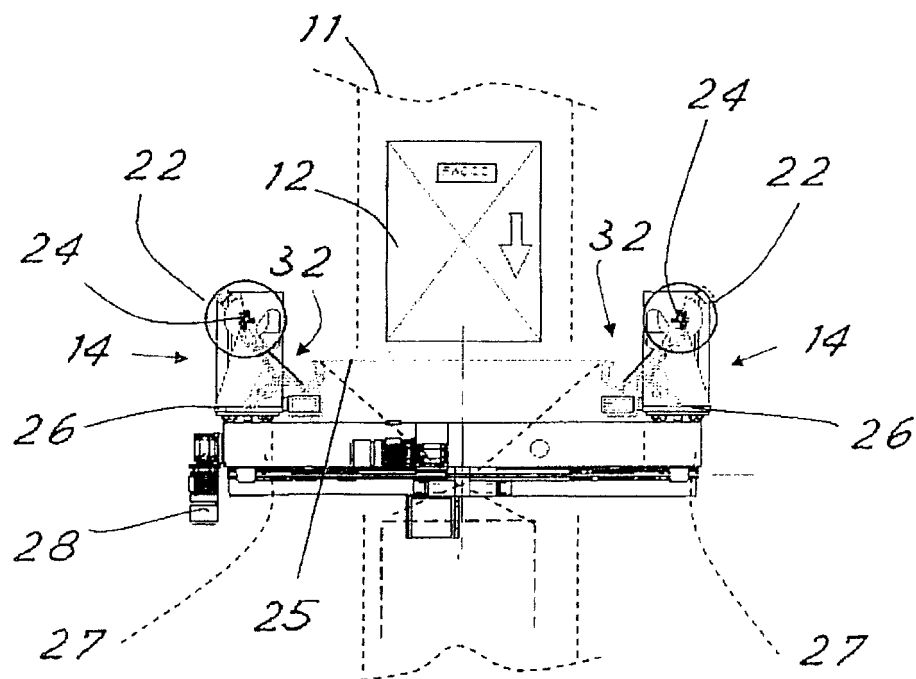
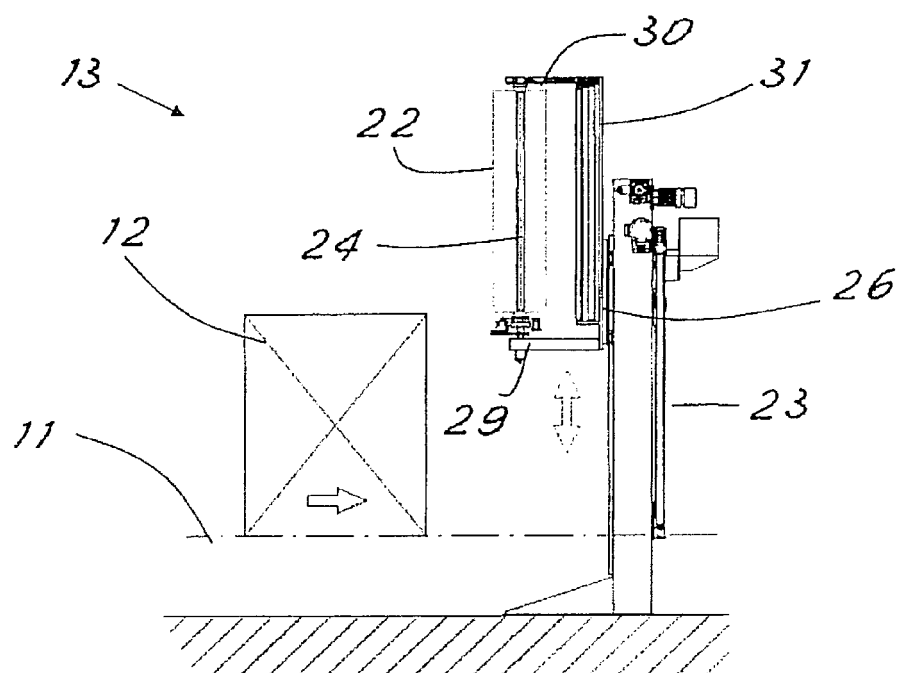
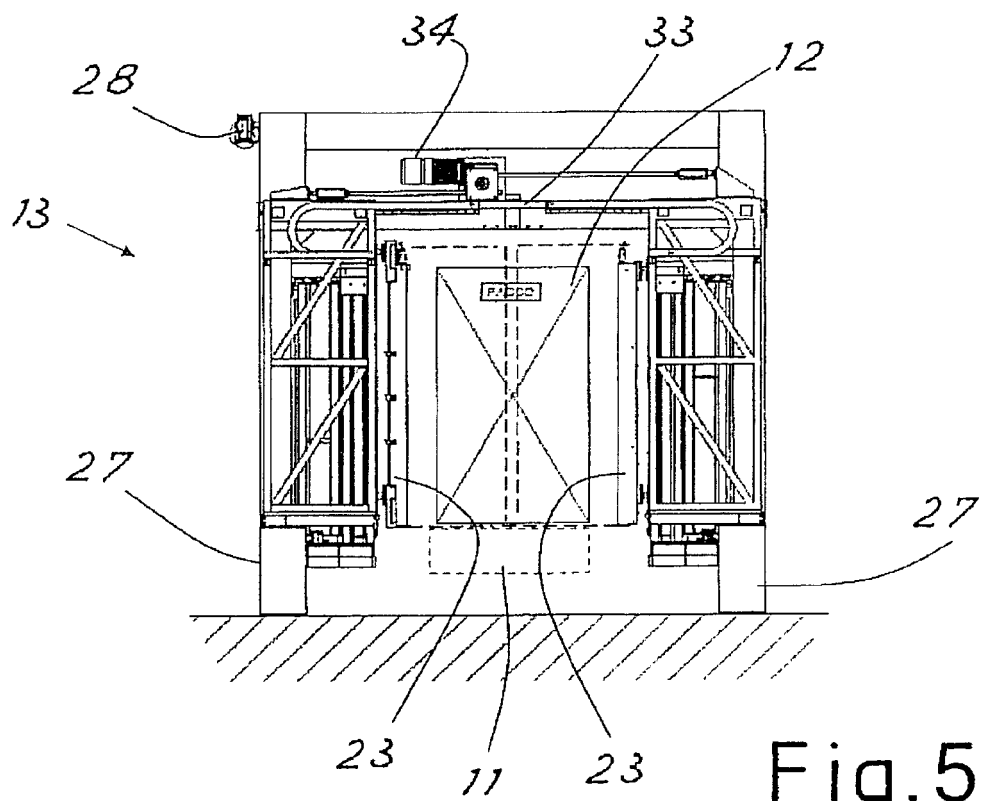


Fig.4



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0183676 A [0003] [0004]