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(54) METHOD AND MACHINE FOR PREPARING GROUPS OF PRE-PACKED PRODUCTS, SUCH AS ROLLS OF PAPER, FOR PACKAGING IN BAGS

VERFAHREN UND MASCHINE ZUR HERSTELLUNG VON GRUPPEN VORVERPACKTER PRODUKTE, WIE ZUM BEISPIEL PAPIERROLLEN ZUR VERPACKUNG IN BEUTELN

PROCÉDÉ ET MACHINE POUR PRÉPARER DES GROUPES DE PRODUITS PRÉ-EMBALLÉS TELS QUE DES ROULEAUX DE PAPIER À ENSACHER

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EP 1 979 235 B1

Description

Technical field

[0001] The invention refers to a machine and method for packaging groups of pre-packed products in varying formats, such as groups of paper rolls or other products coming from one or more packaging machines from which the packages can be discharged with the roll axes arranged horizontally or vertically, in bags obtained from thermoplastic film or sheet unwound from a reel.

Background art

[0002] In the field of paper converting, for the production of packages of toilet paper rolls, kitchen towel rolls, paper napkins and the like, it is custom practice to produce individual packages or groups of pre-packed products, such as groups of paper rolls, wrapped in a thermoplastic sheet. A plurality of said wrapped groups or packages of articles are subsequently grouped together and wrapped into bags, i.e. bagged, each bag being usually formed by a further thermoplastic film or sheet, and each bag containing a predetermined quantity of individual packages, each package being formed by a predetermined number of orderly arranged individual products.

[0003] A packaging and bagging device for packaging and bagging rolls of tissue paper is disclosed in EP-A-1,306,308. An automatic bundling machine including a packaging section and a bagging section is disclosed in US-A-4,679,379. In known devices a plurality of packages are introduced into seats of a chain conveyor, which forms groups of pre-determined packages, each package having a pre-determined dimension. Said group of packages is then moved on an elevator, and from there into a wrapping tunnel or mandrel, i.e. a device which forms a tubular wrap of thermoplastic film around the group of packages. The thermoplastic tubular film is transversely cut and sealed to form a bag around each group of packages.

[0004] A problem that currently exists in the bagging lines of known type is due to the fact that when the format of the product packages to be prepared for bagging varies, many of the line components have to be replaced, resulting in long downtimes and involving difficulties in storage of the components to be replaced.

[0005] US-A-4679379 discloses a bagging machine according to the preamble of claim 11. The machine is not flexible, in that it cannot arrange more than one product in the feed direction.

[0006] WO-A-00/05138 discloses a product conveyor device for a packaging line, including an oscillating distribution conveyor.

[0007] US-A-5732536 discloses a tape roll package machine including a conveyor along which the rolls are made to roll towards a double receiving plate arrangement on which the rolls are discharged. Two retention devices are arranged along the conveyor and controlled by pneumatic cylinders.

Objects and summary of the invention

[0008] According to a first aspect, an embodiment of the invention is aimed at remedying these problems of the known devices, with a solution which, as the format of the product packages varies, requires simple, easy and rapid adjustments, which can be performed automatically, if required, via the use of a few servo controls that can be controlled from the machine control panel, appropriately configured for the purpose.

[0009] According to a different aspect, an object of an embodiment of the invention is to provide a bagging device, which has a compact and simple layout.

[0010] The invention also concerns a method for bagging packages of products which is more efficient than prior art methods. In a preferred embodiment, the invention concerns a method which allows handling of packages of variable formats with easy and quick adjustment interventions on the packaging machine.

[0011] These objects are achieved with a method according to claim 1 and with a machine according to claim 11.

[0012] In an embodiment of the invention, the packages grouped on an elevator are moved by said elevator to the height of said bagging station and transferred from said elevator into a wrapping tube of said bagging station. In a preferred embodiment, the packages are lifted from a lower position, at the level of an advancement conveyor, to an upper position, where a wrapping tube or mandrel of a bagging machine is arranged. Arranging the bagging station underneath the advancement conveyor is not excluded.

[0013] In a possible embodiment of the invention, each bag can include a single layer of packages. In a further embodiment of the invention the packages are grouped according to a plurality of superposed layers, such that each bag includes two or more superposed layers of packages, each layer including one or more packages. In a preferred embodiment the layers are piled up in a superposed configuration on an elevator and then transferred into the bagging station.

[0014] When sets of packages are grouped according to a plurality of superposed layers, said layers can be formed on a first elevator, on which two or more layers of packages are formed. The elevator is then moved towards the bagging station such that the layered packages are transferred, e.g. by means of a pusher, from the elevator into the bagging station, e.g. into the wrapping tunnel of the bagging station. According to a different embodiment, said superposed layers of packages are transferred from a first elevator to a second elevator and said second elevator moves said superposed layers of packages at the height of said bagging station.

[0015] In a preferred embodiment, said packages are fed along a distribution conveyor, preferably in a spaced apart relationship. From said distribution conveyor said

packages are distributed according to a plurality of substantially parallel rows. In an embodiment of the invention said distribution conveyor is pivoted around a preferably approximately vertical swivelling axis arranged at an inlet side of said distribution conveyor, such that an outlet side of said distribution conveyor is sequentially brought into alignment with a plurality of substantially parallel channels to sequentially feed said packages in each said channel and form a row of packages in each said channel.

[0016] In a preferred embodiment, said rows are advanced along a direction substantially aligned with a main direction of advancement of said distribution conveyor. Since the distribution conveyor oscillates in order to distribute the packages in each said rows, the direction of advancement of said distribution conveyor is variable. A main direction of advancement is defined as an approximately mean direction between the various angular positions, which the distribution conveyor can assume when distributing said packages in said rows.

[0017] The invention can typically be used to package and bag rolls of tissue paper, such as toilet rolls, kitchen-towel rolls or the like. In general, the invention can be applied for packaging rolls of wound web material. If the products to be bagged are rolls of wound web material, according to a preferred embodiment said rolls are oriented with their axes in a substantially vertical position and advanced along a substantially horizontal direction from said distributor conveyor to said advancing conveyor.

[0018] In a preferred embodiment, said leading group of packages is discharged from said advancement conveyor on a first elevator and after said leading group of packages has been discharged from said advancement conveyor onto said first elevator, said upstream packages are released and advanced towards the end of said advancement conveyor.

[0019] Further embodiments and advantageous features of the method according to the invention are described here below with reference to the drawings and are set forth in the appended claims.

[0020] The arrangement of the retention device is such that it retains a package in each row of said advancement conveyor such that the flow of packages is interrupted even though the advancement conveyor continues to move. The continued motion of the advancement conveyor causes discharge of the most advanced packages in each row, i.e. the leading group of packages, once the stoppage member has been de-activated. The advancement conveyor, therefore, feeds the leading group of packages on the elevator arranged at the exit side of said advancement conveyor while the upstream packages are prevented from advancing.

[0021] According to a preferred embodiment of the machine of the invention, a feeder is arranged upstream of said distribution conveyor, for feeding correctly oriented and spaced apart packages to the inlet of said distribution conveyor.

[0022] In a preferred embodiment, said feeder is adjustable according to the format of said packages. For example it can include adjustable side walls and/or distanced conveyors, the mutual distance of which can be adjusted according to the height of the packages.

[0023] In a preferred embodiment of the machine according to the invention, also said distribution conveyor is adjustable according to the format of said packages.

[0024] In an advantageous embodiment, said channels on said advancement conveyor are adjustable according to the format of said packages and of said groups of packages to be bagged. They can be adjusted as far as the width and the total number of channels is concerned. I.e. the number of rows of advancing packages can be modified, as well as the transversal dimension thereof.

[0025] Said bagging station can include a pusher for transferring said groups of packages into said bagging station, for example into a wrapping tunnel to which a wrapping film or web is fed from a reel.

[0026] According to a preferred embodiment, the distance between said retention device and the end of said advancement conveyor is adjustable. In this manner the number of packages for each bag can be set as required. If more packages have to be placed in each bag, the distance between the outlet end of the advancement conveyor and the retention device is increased. Such distance is decreased if a smaller number of packages are required in the bag or in each layer of the bag.

[0027] In an embodiment of the invention, said retention device includes a member movable from a retracted position, in which it does not interfere with the packages advancing along said advancement conveyor, and an active position, in which it interferes with the packages advancing along said advancement conveyor. Said movable member can include a retention bar, which is lifted from a position underneath the advancing surface, defined by the active branch of said advancement conveyor, to an extracted position, in order to lift a package from said conveyor and temporarily retain it while the conveyor can continue to advance the packages downstream said retention device. The retention bar can include a retention edge, for example it can be shaped in the form of an L-profile, the edge forming an abutment surface for the packages. In a preferred embodiment the bar co-acts with an upper pinching bar, such that a package is temporarily retained between said two opposing bars for the time required for discharging the downstream packages from the advancement conveyor on the elevator.

[0028] In a modified embodiment, said retention device can include a moving member which is moved from an upper position, clear of said packages, to a lower position, in which it interferes with the packages and retains the foremost package immediately upstream the leading group of packages, i.e. those packages which have to be discharged on the elevator and moved into the bagging station. A lower retention bar moving from a lower inactive position to an upper active position is preferred, since it does not require spacing the packages in each

row.

[0029] In an embodiment of the invention said first elevator is arranged and designed to take at least a first position at the level of said advancement conveyor, to receive packages from said conveyor and a second position at the level of said bagging station, to discharge said packages from said first elevator towards said bagging station. In a preferred embodiment, said elevator is provided with a conveyor, such as a belt conveyor. The belt conveyor is activated to eject the packages from the elevator and/or to abut the packages along a wall placed on a side of the elevator.

[0030] To correctly align the packages on the elevator, in an embodiment of the invention an abutment wall is arranged on the downstream side of said first elevator, against wall which said packages are stopped and aligned when they are transferred on said first elevator. According to the design of the machine, the abutment wall can be fixed or movable.

[0031] In an embodiment of the invention, the stoppage member includes an abutment wall integral with said first elevator, extending downwards therefrom at the upstream side thereof and facing said advancement conveyor. With this arrangement, when said first elevator moves up to transfer the layer of packages to the height of the bagging station, said abutment wall stops the flow of packages on said advancement conveyor, such that no packages falls down from the advancement conveyor. Once the elevator is brought at the level of the advancement conveyor again, the abutment wall is clear of the packages, and the leading group of packages, downstream of the retention device, can be discharged on the first elevator.

[0032] In a different embodiment, said stoppage member includes a movable interception device arranged at the outlet end of said advancement conveyor.

[0033] In an embodiment of the machine which is designed to wrap layered groups of packages, the machine includes a second elevator, arranged downstream said first elevator in the direction of advancement of said packages. The advancement conveyor, said stoppage member, said retention device, said first elevator and said second elevator are arranged and controlled such that when a required group of layered packages has been formed on the first elevator, said first elevator is placed at the same height as the second elevator and said group of layered packages is transferred from said first elevator to said second elevator, so that while the second elevator transfers the group of packages to the bagging station, the first elevator is brought at the level of the outlet end of said advancement conveyor for receiving a new group of packages.

[0034] Further features and embodiments of the machine according to the invention are described here below with reference to the attached drawings and are set forth in the appended claims.

Brief description of drawings

[0035] In the drawings, in which the same or similar parts are indicated with the same reference numbers:

- Fig. 1 and 2 are schematic side elevation and overhead views respectively of a bagging machine in a first embodiment for packaging one single layer of product packages;
- Fig. 1a illustrates an enlarged side elevation of a component of the machine as per the preceding figures;
- Figs. 3, 4 and 5 illustrate a side elevation of the final part of the machine as per the preceding figures during successive work phases;
- Figs. 6 and 7 are side elevation and overhead views respectively of a bagging machine in the version with layering device, for packaging several layers of product packages;
- Figs. 6a and 6b illustrate an enlarged side elevation and overhead view respectively of components of the machine as per figures 6 and 11;
- Figs. 8, 9 and 10 illustrate a side elevation of the terminal part of the machine as per figures 6 and 7 during successive steps of a work cycle;
- Figs. 11 and 12 are side elevation and overhead views respectively of a device for feeding a bagging machine, in the simplified version alternative to that of figures 6 and 7;
- Figs. 13, 14, 15, 16 and 17 illustrate a side elevation of the terminal part of the machine as per figures 11 and 12, during successive work steps;
- Fig. 18 illustrates a side elevation of a possible embodiment of an elevator for the machines as per figures 6 and 11;
- Figs. 19 and 20 illustrate respectively, in perspective, a product package as it arrives at the machine as per figures 1 and 2 and how several packages of this type are bagged by said machine;
- Figs. 21 and 22 illustrate respectively, in perspective, a product package as it arrives at the machines as per figures 6, 7 and how several layered packages of this type are bagged by said machine.

Detailed description of embodiments of the invention

[0036] Figure 19 illustrates a typical package C1 of rolls of paper arranged with their axis horizontally in several rows and in several layers and with the edges L of the heat-sealable wrapping sheet positioned on the ends of the hollow core of said rows of rolls, so that in the heat sealing phase of said edges between a pair of ordinary conveyors with vertical axis, the rolls undergo compression in the axial direction of greatest resistanceto deformation. These packages C1 must usually be fed to a bagging machine; with the axes of the rolls positioned vertically as in Figure 20 and must be arranged in several parallel rows, for example in three rows, so that one or

more packages per row, e.g. two packages per row, can be bagged inside the packaging bag S obtained from a heat-sealable plastic film which is formed into a tube by means of a longitudinal seal, not illustrated, and closed at the opposite ends by means of corresponding transverse seals T1 and T2.

[0037] A packaging of this type can be produced with the machine according to the invention, which is now described with reference to the Figures from 1 to 5 in a first embodiment. In these Figures, 1 indicates a tubular mandrel or wrapping tunnel with a horizontal axis, on which a continuous strip 102 of thermoplastic material runs longitudinally, unwound from a reel 2 controlled by unwinding means, not shown, controlled by a guide pulley 3 also of known type. As it runs on the wrapping tunnel 1, the strip 102 is folded and then formed into a tube and its longitudinal overlapping edges are sealed by a known longitudinal sealing means 4, so that said wrapping tunnel produces a continuous tunnel of plastic material which, correctly timed, undergoes, by known means schematically indicated by the opposite arrows 5, positioned downstream of said wrapping tunnel 1, a double transverse seal and is cut in-between the seals to close the end of the filled bag and the beginning of the new bag and to separate the filled closed bag, which can thus be moved away, from the new bag being formed.

[0038] The packages to be bagged are arranged as described below on an elevator 6 which in a step of its work cycle is at the same level as the wrapping tunnel 1, so that packages arranged on the elevator 6 can be pushed into and through the forming wrapping tunnel 1 and beyond it by the action of a known horizontal pusher 7, which pushes a portion of the bag- forming film along with the packages inside the film downstream of the sealing and cutting means 5 which, properly timed, act as soon as said pusher 7 is retracted, so as to produce the bag S illustrated in Figure 20, inside which the packages will be packed tightly and blocked, exploiting the deformability and consequent elasticity of the packages on the horizontal plane, both lengthwise and crosswise, due to the arrangement of the rolls with their vertically oriented axes.

[0039] In an embodiment, the packages C1 (see Figure 19), are initially arranged with their roll axes horizontal and move in single file in the direction of the arrow F. For example they come in this position from an upwardly arranged packaging machine (not shown). From Figures 1 and 2 it can be seen that the machine according to the invention comprises first positioning means 8 which feed the packages C1 forward, subjecting them to a transverse rotation of 90°, so as to position them with their roll axes vertical; said means comprise, for example, a pair of adjacent belt conveyors 108, 208 which run in the same direction and at the same speed, the conveyor numbered 208 being of limited width and horizontal, while the wider one 108 slopes longitudinally downwards, so that while the package C1 performs a downward movement on this conveyor, the same is supported on one side by the horizontal conveyor 208 which causes it to perform the desired rotation of 90°.

[0040] At the outlet of the positioning conveyor 8, the packages C1 reach a horizontal motor-driven conveyor 9, which feeds said packages to a pair of reciprocally parallel conveyors 10, one above the other and appropriately motor-driven. Said conveyors 10 form a feeder, which feeds said packages at the right distance from one another (i.e. suitably distanced one from the other) onto the initial end, i.e. the inlet end of a rectilinear type horizontal belt distribution conveyor 11, which is pivoted about a substantially vertical axis 111 and is provided with lateral guides 211 and with appropriate motor. Said distribution conveyor 11 is provided with swivel means, not shown, which causes the distribution conveyor 11 to oscillate about the axis 111 so that its outlet end can be cyclically positioned in different horizontal positions, for example in three different positions as shown in Figure 2, so as to feed the packages C1 in rapid succession into three substantially parallel channels 12. The channels have an adjustable width according to the format (e.g. the transverse dimensions) of the packages C1. Each channel is laterally defined by lateral guides 12 positioned with appropriate adjustment means, not shown, on one single advancement conveyor 13. In an embodiment of the invention, the advancement conveyor 13 is formed by a single wide belt, as shown in the drawings. However, in an alternative embodiment said advancement conveyor can include a plurality of parallel narrow belts.

[0041] The advancement conveyor 13 is driven by appropriate motor means, which causes the packages C1 to advance and to stop against a stopping member. In an embodiment of the invention said stopping member includes a vertical wall 106 integral with the movable frame of the elevator 6.

[0042] In an embodiment of the invention, an intermediate stretch or portion of the upper branch and of the lower branch of the conveyor 13, as better highlighted also in Figure 1a, runs on groups of parallel idle rollers 14. 15 positioned at the vertexes of hypothetical isosceles trapeziums positioned one inside the other and with the smaller base facing upwards, so as to form in the upper branch of said conveyor a small transverse aperture through which a retention or stop bar 16 can operate, which can be raised and lowered by an actuator (not shown). Said bar co-acts with a parallel upper bar 17 which, as the format of the packages C1 varies, can be adjusted in terms of distance from the conveyor 13, so as to substantially skim the tops of the packages moving on said conveyor. These latter components 14, 15, 16 and 17 are fitted on a carriage 18, the sides of which run on horizontal guides 19 and which is connected to manual or automatic adjustment means so that, as the format of the packages C1 or the format of the final package S varies, the bars 16 and 17 can be positioned immediately upstream of the group of packages, which each channel of the conveyor 13 has to transfer to the elevator 6 for

forming a single package S.

[0043] In a preferred embodiment the elevator 6 is of the type in which the work-ing surface is formed by a horizontal conveyor 206 driven in the same direction as the conveyor 13. Downstream of the elevator 6 a vertical fixed wall 20 is provided, above which the film 102 passes towards the wrapping tunnel 1. As best shown in Figure 2, the terminal part of the conveyor 13 and laterally to the elevator 6, there are lateral guides 21 provided with means for adjusting the reciprocal distance as the format of the packages to be bagged varies.

[0044] The machine according to this first embodiment operates as follows. At the end of one work cycle and the beginning of the next work cycle, the elevator 6 is in the raised position as shown in Figure 1 with its wall 106 stopping the flow of packages fed into each channel 12 of the conveyor 13. If, as in the example shown in Figures 19 and 20, three rows of packages have to be cyclically fed into the packaging bag S with two packages per row, the unit consisting of bar 16 and the counter bar 17 is positioned at the level of the third package starting from the one that touches the stop plate 106. Thus, a leading group of packages, including two packages per channel 12, is formed, said leading group of packages is discharged on the elevator 6 as described later on and then transferred to the bagging station 1-5.

[0045] While the pusher 7 terminates its work cycle and retracts and while closing and separation of a bag S full of packages downstream of the wrapping tunnel is completed, the command is given for lifting of the bar 16 as in Figure 3, so that the latter stops the third package in each channel 12, lifting it from the upper branch of the conveyor 13 and blocking it against the upper bar 17 while, correctly timed, the elevator 6 is lowered onto the same plane as the conveyor 13 so as to receive from said conveyor 13 the leading group of packages (two per row) positioned downstream of said bars 16, 17 and convey them against the fixed wall 20, as shown in Figure 4. The leading group of packages C1 downstream of bars 16, 17 are moved on the elevator 6 by the very motion of the advancing conveyor 13, while the flow of packages C1 upstream of the leading group is prevented by bars 16, 17. In a preferred embodiment, belts 206 (forming a conveyor on the upper surface of the elevator 6) move the packages C1 forward against wall 20.

[0046] Subsequently, while the pusher 7 has in the meantime returned to the retracted cycle start position, the elevator 6 is raised to the same plane as the lower wall of the wrapping tunnel 1, as shown in Figure 5, so that the groups of packages arranged on the elevator 6 can then be transferred by the conveyor 206 of said elevator and by the pusher 7 through the wrapping tunnel 1 for a subsequent bagging phase. The bagging step as such is known and not described in detail. In this same phase, the machine returns to the condition of Figure 1, since following lowering of the stop bar 16 the packages C1 temporarily retained by the bars 16, 17 are released and the rows of packages fed by the conveyor 13 can advance until they are stopped against the high wall 106 of the elevator 6.

[0047] While the pusher 7 completes its work cycle and then returns to the rest position and while the means 5 operating downstream of the wrapping tunnel 1 close the full bag S as shown in Figure 20 and separate it from the next bag closed at the front, the machine prepares for a new work cycle.

[0048] It is clear that, as the format of the packages to be bagged varies, only adjustment operations have to be performed, thus avoiding complex, costly and lengthy operations for replacement of machine components, as required by the known machines. Advantageously,a reduction of machine downtime is achieved and; if required, all or some of the adjustments can be made automatically, by providing suitable servomotors or actuators, which move the parts and components of the packaging line which require adjustment.

[0049] Figures 6 to 10 show a further embodiment of the machine according to the invention. In this embodiment, the machine includes a layering device, which is used when several packages have to be stacked on one another in a layered condition and in said condition inserted in the wrapping tunnel 1 of the bagging station.

[0050] The need for layered packages is particularly felt when the packages are of limited height, for example those C2 of the flat rectangular type illustrated in Figure 21, with the rolls arranged with their axis in a vertical position and with the overlapping and reciprocally sealed edges L of the package now positioned on the lateral surface of the end rolls.

[0051] As illustrated in the example of Figure 22, three layers of packages C2 as in Figure 21 must be arranged on top of one another in layers, for example in three layers, and this pre-arranged layered group of packages must be inserted through the aforementioned wrapping tunnel 1 for formation of the packaging bag S as in Figure 22.

[0052] To form said bag, if necessary with packages different from those illustrated in Figure 21, with the same advantages as those mentioned previously for the machine as per Figures 1 to 5, the machine shown in Figures 6 and 7 comprises an initial conveyor 8' fed with packages C2 that move in the direction of the arrow F (see also Figure 21). Said first conveyor positions the packages C2 with their larger dimension in the feed direction, for example by acting pushing said packages C2 against a lateral initially inclined guide 308'.

[0053] At the outlet of the positioning conveyor 8', the packages C2 are introduced between the pair of motor-driven parallel conveyors 10 positioned one above the other that feed said packages at an appropriate distance from one another to the exchange conveyor 11, which in turn distributes said packages in the various channels 12 of the conveyor 13, which moves the packages forward in several adjacent rows and is constructed in the same way as previously described with reference to Figures 1 and 1a. In this case, however, at the end of the conveyor

13 an interception device 22 is provided, which on command is positioned in front of the flow of packages to stop them and which, correctly timed, can be neutralised to permit the feed of said flow of packages. Good results have been obtained with a square-shaped device with one side facing downwards and pivoting with the end of the other side on an axis 122 (Fig.6a), which can be height adjusted as the format of the packages varies, and which is connacted to oscillation means such that the side of the same facing downwards can be lowered or raised, on command, as described below.

[0054] The bar 16 and the upper counter bar 17 are adjusted so that they are positioned above the initial part of the package C2 which follows the one stopped by the aforementioned interception device 22. Downstream of said device 22 there is a pair of parallel motor-driven rollers 23 positioned one above the other, the lower one of which is at the level of the conveyor 13 and is in a static position, while the upper one can be height-adjusted if the format of the packages varies. The rollers 23 rotate in a direction to feed the packages coming out of the conveyor 13 at a speed equal to and/or appropriately higher than that of said conveyor 13.

[0055] Downstream of the pair of rollers 23 is a first elevator 24 formed of a plurality of parallel belts 124 which, on command, can be operated by motor means (see below) for feeding the packages forward and which terminate downstream in a comb-like arrangement, so that the vertical teeth of a comb 25 connected to raising and lowering means, not shown, can be positioned between them.

[0056] At the beginning of each cycle, the elevator 24 is on the same plane as the conveyor 13 and the comb 25 is in a raised position, so as to protrude through the belts 124 and above said elevator at a height sufficient to stop a layer of packages C2. Downstream of the elevator 24 there is a second elevator 6 similar to elevator 6 in Figures 1 and 2, with the fixed wall 20 downstream. Other parts of the machine shown in Figs. 6 and 7 similar to those shown in Figs. 1-5 are not disclosed and reference is made to the description of the previous embodiment.

[0057] The machine shown in Figures 6 and 7 operates as follows (see Figs. 6, 8, 9, 10). As illustrated also in Figure 8, correctly timed with intervention of the bar 16 which stops the second package C2 against the upper bar 17, the interception device 22 is raised and the head package (i.e. the leading package C2) is transferred by the advancement conveyor 13, which remains active, and by the thrust rollers 23 onto the first elevator 24. In this phase the belts 124 of the first elevator 24 can be maintained in motion to ease advancement of the packages C2 on the surface of the elevator 24. After the first package C2 has been positioned on the elevator 24, the conveyor belts 124 can be deactivated.

[0058] Subsequently the interception device 22 moves back down and the bar 16 is lowered so that the next package C2 is positioned against the device 22. According to a proper time sequence, the first elevator 24 moves down one step, which is preferably equal two or slightly greater than the height of a package C2. Then a second package is fed onto the elevator 24 and the cycle is then repeated until three packages C2 have been stacked on the first elevator 24, as shown in Figure 9.

[0059] When the second and third package C2 are stacked on the first elevator. 24, the action of the thrust rollers 23 is decisive as they move the packages at the outlet of the conveyor 13 forward to ensure that they stop against the comb 25. In these steps the bar 16 moves up and down cyclically and the interception device 22 is also lowered and raised so that, cyclically, a set of packages (one for each channel 12 in the example shown) comes out of the thrust rollers 23, for stacking on the auxiliary elevator. It is not excluded that a different number of packages C2, for example two packages C2, are fed each time from the advancement conveyor 13 onto the elevator 24. In this case the bars 16, 17 are adjusted a step backwards, such that they act on the third package C2, i.e. leaving the first and second package C2 in each row free to be discharged from the conveyor 13 on the stack being formed on the elevator 24.

[0060] When the three layers of packages C2 have been stacked on the auxiliary elevator 24, the same is raised to the position shown in Figure 10 and the comb 25 is lowered, so that with subsequent activation of the belts of the conveyor 124 on elevator 24 and the of the conveyor of the second elevator 6, the grouped pile or stack of layered packages C2 passes onto the man elevator 6 and stops against the fixed wall 20, as illustrated by the broken line in the same Figure 10.

[0061] Subsequently, while the main elevator 6 moves up and the pusher 7 is activated to insert the layered group of packages in and beyond the bagging station 1, 5, as in Figure 8, the comb 25 is raised and the first elevator 24 is activated to receive from the advancement conveyor 13 a first package C2 of a next group of packages. Then the cycle described above is repeated.

[0062] It is understood that lateral guides, not shown, are provided for controlling the layered group of packages on the auxiliary elevator 24 and on the main elevator 6. It is clear that also in this type of machine, as the product format varies, only adjustment operations have to be performed and these can be easily automated.

[0063] With reference to the Figures from 11 to 17 a machine with layering device is now described, in a simplified embodiment with respect to the one of Figures 6 to 10. In the embodiment of Figs. 11-17 layering of the packages is performed directly on a first elevator 6' similar to the first elevator 24 of the machine shown in Figs. 6-10 (see below). Said elevator 6' is also used to move the layered packages C2 from he level of the outlet of the advancement conveyor 13 to the level of the wrapping tunnel 1. Members and parts of the machine of Figs. 11 to 17 which are equal or equivalent to those of the embodiment shown in Figs. 6 to 10 are indicated with the same reference numbers and are not described again.

[0064] The structure of elevator 6' is similar to the structure of elevator 24 and includes comb-like belts, so that between the comb-like end of its belts, facing towards the wrapping tunnel 1, the downward-facing teeth of a comb 25' can operate. In this embodiment the comb 25' is fixed rather than movable as comb 25 (Figs. 6-11).

[0065] In the example shown in Figure 18, the parallel belts 306' of the conveyor provided on top of elevator 6' or those 124 of the elevator 24 described previously can be such as to derive their movement from a motor 406 in a fixed position, by means of a belt 306 guided about another pulley 506 in a fixed position and about pulleys 606 that can be moved with said elevator and are sustained by it. It is understood, however, that the belts of the elevator 6' and those of the elevator 24 can be driven by any other suitable means, e.g. by means of a motor supported by the elevator itself.

[0066] From Figure 11 it can be seen that to limit the downtime between one cycle and the next one, the outlet of the conveyor 13 has been raised and moved nearer below the pusher 7, so that it is a short distance from the height position of the wrapping tunnel 1 and to avoid interferences between said pusher 7 and the parts below it, said conveyor 13 with relative lateral guides 12 has been longitudinally inclined so that only its outlet is raised. All the other components of the machine are the same as those described for the machine in Figures 6 and 7.

[0067] Operation of the machine as in Figures 11 and 12 is as follows (see Figs. 13-17). At the beginning of the cycle, the elevator 6' is at the level of the outlet of the conveyor 13, so as to receive from the latter a first layer of packages C2 (in the example one package C2 for each channel 12), which stop against the comb 25', as shown in Figure 13. Subsequently the same elevator 6' is gradually lowered by a step equal to or slightly greater than the height of a layer of packages, so that the various layers of packages are stacked or layered in succession on said elevator 6' by the pair of thrust rollers 23, while each layer is stopped by the stationary comb 25' arranged at the right distance, while the bar 16 and the stop device 22 are raised and lowered, in the correct time sequence as described previously with respect to the embodiment of Figs. 6-10. The operation sequence thus obtained is shown in the succession of Figures 14, 15, 16.

[0068] Once the layering has been completed, as illustrated in Figure 17, while the interception device 22 is in the low position and while the bar 16 returns to the low position, the elevator 6' moves up to the level of the wrapping tunnel 1 and the pusher 7 transfers the group of layered packages inside and beyond the wrapping tunnel 1. As soon as the packages have been discharged from the elevator 6', the latter is lowered to the level of the advancement conveyor 13 and the device 22 is raised to repeat the cycle, while the pusher 7 completes its work stroke and then returns to the rest position to prepare for the next work cycle.

[0069] As the height of the packages to be bagged varies, adjustment means can be provided as for the preceding machine embodiment shown in Figures 6 and 7, or easy register means can be provided to modify the angle of said conveyor 13, so as to raise or lower the height of the outlet thereof; while the interception device 22 associated with said outlet can be kept at a constant height, like the counter bar 17 and the upper one of the motorised parallel thrust rollers 23, while the lower one of said rollers follows the movement of the outlet of said conveyor 13, to which the cycle start height of the elevator 6 can be adapted via suitable means. It is understood that even if not illustrated, also in this embodiment of the invention lateral guides are provided, adjustable according to format, to control the flow of products in the terminal part of the conveyor 13 and on the elevator 6', like those indicated by 21 in the machine of Figure 2.

[0070] Also in this embodiment, as the product format varies, only quick easy adjustments have to be performed which, if required, can be easily automated. In all three described embodiments of the machine, the distribution conveyor 11 can be kept still to feed a flow of products to only one of the channels of the feed conveyor 13 if it is necessary to produce packages S formed of only one row of packages C1 or C2 arranged in one or more layers.

[0071] The aforementioned thrust rollers 23 can be replaced by a pair of parallel conveyors positioned one above the other, similar to 10 but also shorter.

[0072] It is understood that the description refers to some preferred embodiments of the invention, to which numerous construction variations and modifications can be made, without departing from the principle underlying the invention, as described above, as illustrated and as claimed below. In the claims, the references in brackets are purely a guide and do not limit the scope of the protection of said claims.

Claims

1. Method for bagging groups of packages of prepacked products of varying format, in bags obtained from thermoplastic film or sheet unwound from a reel, **characterized by** the following steps:

   - distributing packages by a distribution conveyor (11), which pivots on a swivelling axis (111), on to an advancement conveyor (13)
   - feeding correctly oriented packages along a pre-set number of rows in channels (12) of said advancement conveyor (13);
   - discharging and grouping on an elevator (6, 6', 24) a preset number of packages from each said rows, while the packages upstream the ones discharged on said elevator (6, 6', 24) are retained by a retention device (16,17) arranged along said advancement conveyor (13) at a disclosure from an outler end to stop the entire flow of upstream packages;
   - raising the grouped packages to the height of

a bagging station (1-5);
- transferring said grouped packages in said bagging station (1-5) and introducing said grouped packages in a thermoplastic tubular wrapping film;
- forming a bag with said tubular wrapping film.

2. Method according to claim 1, **characterized in that** said packages grouped on said elevator (6, 6'; 24) are moved by said elevator to the height of said bagging station (1-5) and transferred from said elevator (6, 6'; 24) into a wrapping tube of said bagging station (1-5) by a pusher (7) which moves substantially parallel to the direction of .advancement of said rows of products.

3. Method according to claim 1 or 2, **characterized in that** said packages are grouped according to a plurality of superposed layers, and that said superposed layers of packages are transferred into said bagging station (1-5).

4. Method according to claim 1, **characterized in that** said packages are grouped according to a plurality of superposed layers on said elevator (6'; 24) and that said superposed layers of packages are transferred from said elevator (6'; 24) to a further elevator (6), said further elevator (6), moving said superposed layers of packages at the height of said bagging station (1-5).

5. Method according to one or more of the preceding claims, **characterized in that** said packages are fed along a distribution conveyor (11), and distributed according to a plurality of substantially parallel rows, said distribution conveyor (11) being pivoted around a swivelling axis (111) arranged at an inlet side of said distribution conveyor (11), such that an outlet side of said distribution conveyor (11) is sequentially brought into alignment with a plurality of substantially parallel channels (12) to sequentially feed said packages in each said channel (12) and form a row of packages in each said channel (12).

6. Method according to one or more of the preceding claims, **characterized in that** said pre-packaged products are rolls of wound web material, such as paper, and preferably tissue paper, in said rows said rolls being oriented with their axes in a substantially vertical position.

7. Method according to one or more of the preceding claims, **characterized by** the following steps:

- forming said rows along an advancement conveyor (13);
- temporarily stopping said rows at the end of said advancement conveyor (13);
- in each row, defining a leading group of packages to be discharged, said leading group including a pre-set number of packages in each row;
- temporarily retaining the packages upstream said leading group of packages;
- while said upstream packages are temporarily retained, discharging said leading group of packages from said advancement conveyor (13);
- releasing and advancing said upstream packages towards the end of said advancement conveyor.

8. Method according to claim 7, **characterized in that**: said leading group of packages is discharged from said advancement conveyor (13) on a first elevator (6'; 24), and after said leading group of packages has been discharged from said advancement conveyor (13) onto said first elevator, said upstream packages are released and advanced towards the end of said advancement conveyor.

9. Method according to claim 8, **characterized by** discharging from said advancement conveyor (13) in sequence a plurality of leading groups of packages, said plurality of leading groups being layered one on top of the other on said first elevator and said layered groups of packages being introduced into said bagging station.

10. Method according to claim 9, **characterized in that**: said layered groups of packages are transferred directly by said first elevator (6'; 24) at the level of said bagging station (1-5), or said layered groups of packages are transferred from said first elevator (6; 24) to a second elevator (6), said second elevator (6) is lifted at the level of said bagging station (1-5) for transferring the layered groups of packages into said bagging station (1-5), while on said first elevator (6'; 24) a next set of groups of packages are layered.

11. A machine for bagging groups of packages of prepacked products of varying format, in bags obtained from thermoplastic film or sheet unwound from a reel, including: an advancement conveyor (13) with an inlet end and an outlet end, said advancement conveyor (13) being provided with adjacent channels (12), said packages forming adjacent rows travelling in said channels along said advancement conveyor; a stoppage member (22; 106) for temporarily stopping the rows of packages at the end of said advancement conveyor (13); a first elevator (6; 6'; 24) for collecting the rows of packages at the outlet of said advancement conveyor (13) and move said packages to a bagging station (1-5); **characterized by** further comprising:

- a distribution conveyor (11), which pivots on a swivelling axis (111), arranged to receive said packages, said advancement conveyor being arranged downstream downstream of said distribution conveyor;
- a retention device (16,17) arranged along said advancement conveyor (13) at a distance from said outlet end, for cyclically retaining on said advancement conveyor (13) a package (C1; C2) of each row positioned immediately upstream of the package(s) to be discharged on said first elevator (6; 6'; 24) when said stoppage member (22; 106) is de-activated.

12. Machine according to claim 11, **characterized in that** a feeder (10) is provided for feeding correctly oriented and spaced apart packages to the inlet of said distribution conveyor (11), said feeder being adjustable according to the format of said packages: that said distribution conveyor (11) is adjustable according to the format of said packages; that an orienting device (8, 8') is provided, for correctly orienting the flow of packages with their axes oriented vertically, said orienting device being adjustable according to the format of said packages; that said swivelling axis (111) of said distribution conveyor (11) is substantially vertical; and that said channels (12) on said advancement conveyor (13) are adjustable according to the format of said packages and of said groups of packages to be bagged.

13. Machine according to claim 11 or 12, **characterized by** a pusher (7) for transferring said groups of packages into said bagging station (1-5), said pusher (7) moving in a substantially horizontal direction parallel to the direction of advancement of the products on said advancement conveyor (13)..

14. Machine according to claim 13, **characterized in that** said orienting device (8, 8') is designed and arranged to impart to said packages (C1; C2) a transverse rotation of 90°, as they advance along said orienting device.

15. Machine according to one or more of claims 11 to 14, **characterized in that** said feeder (10) includes a pair of motor-driven conveyor devices placed one above the other, which feed said packages (C1, C2) distanced from one another to the subsequent distribution conveyor (11), the distance between said motor-driven conveyor devices being preferably adjustable.

16. Machine according to one or more of claims 11 to 15, **characterized in that** the distance between said retention device (16, 17) and the end of said advancement conveyor (13) is adjustable.

17. Machine according to one or more of claims 11 to 16, **characterized in that** said retention device (16, 17) includes a movable member (16) movable from a retracted position, in which it does not interfere with the packages advancing along said advancement conveyor (13), and an active position, in which it interferes with the packages advancing along said advancement conveyor (13); and that said movable member is retractable underneath an upper branch of said advancement conveyor (13) and co-acts with a fixed member (17), said fixed and movable members (16, 17) retaining said packages by pinching the packages therebetween.

18. Machine according to one or more of claims 11 to 17, **characterized in that** said retention device is supported by a carriage (18), the position of said carrriage (18) being adjustable along said advancement conveyor (13).

19. Machine according to one or more of claims 11 to 18, **characterized in that** said advancement conveyor (13) has an intermediate portion of at least the upper branch which is guided on a group of parallel idle rollers (14, 15), so as to form in the upper branch of said conveyor a small transverse aperture through which a retention bar (16) can operate, which can be raised and lowered by an actuator so as to protrude or not protrude from said aperture; and that the lower branch of said advancement conveyor is guided on a group of parallel idle rollers (15); that said retention bar co-acts with a parallel upper bar (17); and that said upper bar (17) has a preferably adjustable position, such that as the format of the packages (C1, C2) varies, said upper bar (17) can be adjusted in terms of distance from the advancement conveyor (13) so as to substantially skim the tops of the packages (C1, C2) moving on said advancement conveyor (13); when said retention bar (16) is raised, said retention bar pinches a package positioned above said retention bar against said upper bar (17), raising said package from the conveyor (13), which can remain active to discharge the packages downstream of the one that has pinched, whereas when said lower bar (16) is lowered, it does not interfere with the flow of packages in transit.

20. Machine according to claim 19, **characterized in that** said retention bar (16) and said idle rolls (14, 15) are mounted on a carriage (18), the sides of which run on horizontal guides (19) parallel to the advancement conveyor (13); adjustment means being provided to adjust the position of said carriage with respect to said advancement conveyor (13), so that, as the format of the packages (C1, C2) varies, said retention bar (16) is positioned upstream of a group leading packages which each channel (12) of the advancement conveyor (13) has to cyclically dis-

charge onto said first elevator; and wherein said upper bar is preferably supported by said carriage (18).

21. Machine as claimed in one or more of claims 11 to 20, **characterized in: that** said first elevator (6; 6') is arranged and designed to take at least a first position at the level of said advancement conveyor (13), to receive packages (C1; C2) from said conveyor and a second position at the level of said bagging station (1-5), to discharge said packages from said first elevator (6; 6') towards said bagging station (1-5); and that said first elevator is provided with a substantially horizontal conveyor (206);

22. Machine according to claim 21, **characterized by** a preferably fixed abutment wall (20; 25') arranged on the downstream side of said first elevator (6;6'), against which said packages (C1; C2) are stopped and aligned when they are transferred on said first elevator (6; 6'); and that said stoppage member includes an abutment wall (106) integral with said first elevator (6), extending downwards therefrom at the upstream side thereof and facing said advancement conveyor (13); when said first elevator (6) moves up to transfer the layer of packages (C1) to the height of the bagging station (1-5), said abutment wall (106) stopping the flow of packages (C1) on said advancement conveyor (13).

23. Machine according to one or more of claims 11 to 21, **characterized in that** said stoppage member includes a movable interception device (22) arranged at the outlet end of said advancement conveyor (13), a motor driven advancing device (23) being preferably arranged downstream said interception device (22) and upstream said first elevator (6'; 24), said advancing device being designed and controlled to transfer the packages (C2) forward at a speed sufficient for depositing them correctly on said first elevator (6'; 24) or on a layer of packages previously deposited on said elevator.

24. Machine according to claim 23, **characterized in that** said motor-driven advancing device includes a pair of parallel rollers or short conveyors (23) positioned one above the other, the distance there between being adjustable according to the format fo the packages (C2); and that an abutment (25; 25') is arranged downstream of said first elevator to stop the packages transferred by said advancing device (23) from said advancement conveyor (13) onto said first elevator (6'; 24).

25. Machine according to one or more of claims 11 to 24, **characterized in: that** said first elevator (6'; 24) includes a conveyor comprised of parallel belts (124, 306'), controlled for moving the packages (C1; C2) forward and which terminate downstream in a comb-like configuration, so that vertical teeth of a comb (25, 25') can be positioned between said parallel belts to stop the packages correctly stacked on said elevator; that said comb (25) is connected to raising and lowering means; that a second elevator (6) is provided, arranged downstream said first elevator (6'; 24) in the direction of advancement of said packages (C1, C2); that said advancement conveyor (13), said stoppage member (22), said retention device (16, 17), said first elevator (6'; 24) and said second elevator (6) are arranged and controlled such that when a required group of layered packages (C2) has been formed on the first elevator (6'; 24), said first elevator (6'; 24) is placed at the same height as the second elevator (6) and said group of layered packages is transferred from said first elevator (6'; 24) to said second elevator (6), so that while the second elevator (6) transfers the group of packages (C2) to the bagging station (1-5), the first elevator (6'; 24) is brought at the level of the outlet end of said advancement conveyor (13) for receiving a new group of packages (C2); and that said comb (25) is combined with said first elevator (6'; 24) and moved in synchronism therewith such that said comb (25) is lowered to allow transfer of said packages (C2) from said first elevator (6'; 24) to said second elevator (6) and is raised again when said first elevator (6'; 24) is brought back at the level of the outlet of said advancement conveyor (13).

26. Machine according to claim 25, **characterized in that** said comb (25) is in a fixed position and the advancement conveyor (13) is positioned with its outlet at a distance from the bagging station (1-5), equal to or slightly greater than the height of one of the bags to be packed, said advancement conveyor (13) being preferably positioned in a longitudinally sloping position.

27. Machine as claimed in claim 26, **characterized in that** it comprises adjustment means so that, as the height of the packages (C1, C2) to be bagged varies, it is possible to modify the inclination of said advancement conveyor (13) to raise or lower the outlet thereof, and that said stoppage member (22) associated with said outlet is kept at a constant height, and that said retention device preferably includes a stop counter bar (17), which is kept at a constant height when the height of said packages varies

28. Machine as claimed in any one or more of claims 11 to 27, **characterized in that** means are provided for setting said distribution conveyor (11) to a fixed position, to feed a flow of products to one only of the channels (12) of said advancement conveyor (13).

Patentansprüche

1. Verfahren zum Verpacken von Gruppen von Pakkungen vorverpackter Produkte unterschiedlichen Formats in Beuteln, die von einer von einer Rolle abgewickelten thermoplastischen Folie oder Lage erhalten werden, **gekennzeichnet durch** die folgenden Schritte:

- Verteilen von Packungen **durch** einen auf einer Schwenkachse (111) sich verschwenkenden Verteilungsförderer (11) auf eine Fördervorrichtung (13),
- Zuführen korrekt ausgerichteter Packungen entlang einer vorbestimmten Anzahl von Reihen in Kanälen (12) der Fördervorrichtung (13);
- Entladen und Gruppieren einer vorbestimmten Anzahl von Packungen jeder der Reihen auf einem Senkrechtförderer (6, 6' 24), während die Packungen stromaufwärts derjenigen, die auf den Senkrechtförderer (6, 6', 24) entladen werden, von einer entlang der Fördervorrichtung (13) mit einem Abstand von einem Austrittsende angeordneten Festhalteeinrichtung (16, 17) festgehalten werden, um den gesamten Strom stromaufwärts gelegener Pakkungen anzuhalten;
- Heben der gruppierten Packungen auf die Höhe einer Verpackungsstation (1-5);
- Übergeben der gruppierten Packungen in die Verpackungsstation (1-5) und Einbringen der gruppierten Packungen in eine rohrförmige thermoplastische Verpackungsfolie;
- Ausbilden eines Beutels mit der rohrförmigen Verpackungsfolie.

2. Verfahren nach Anspruch 1,
dadurch gekennzeichnet, dass
die auf dem Senkrechtförderer (6, 6', 24) gruppierten Packungen von dem Senkrechtförderer auf die Höhe der Verpackungsstation (1-5) bewegt und mittels einer Schubvorrichtung (7) von dem Senkrechtförderer (6, 6', 24) in ein Verpackungsrohr der Verpakkungsstation (1-5) übergeben werden, wobei die Schubvorrichtung (7) sich im Wesentlichen parallel zur Förderrichtung der Produktreihen bewegt.

3. Verfahren nach Anspruch 1 oder 2,
dadurch gekennzeichnet, dass
die Packungen gemäß einer Vielzahl von aufeinandergelegten Lagen gruppiert werden, und dass die aufeinandergelegten Packungslagen in die Verpakkungsstation (1-5) übergeben werden.

4. Verfahren nach Anspruch 1,
dadurch gekennzeichnet, dass
die Packungen gemäß einer Vielzahl von aufeinandergelegten Lagen auf dem Senkrechtförderer (6', 24) gruppiert werden, und dass die aufeinandergelegten Pakkungslagen von dem Senkrechtförderer (6', 24) an einen weiteren Senkrechtförderer (6) übergeben werden, wobei der weitere Senkrechtförderer (6) die aufeinandergelegten Packungslagen auf die Höhe der Verpackungsstation (1-5) bewegt.

5. Verfahren nach einem oder mehreren der vorangehenden Ansprüche,
dadurch gekennzeichnet, dass
die Packungen entlang eines Verteilungsförderer (11) zugeführt und gemäß einer Vielzahl von im Wesentlichen parallelen Reihen verteilt werden, wobei der Verteilungsförderer (11) um eine an einer Eintrittsseite des Verteilungsförderers (11) angeordneten Schwenkachse (111) verschwenkt wird, derart, dass eine Austrittsseite des Verteilungsförderers (11) aufeinanderfolgend mit einer Vielzahl von im Wesentlichen parallelen Kanälen (12) in Ausrichtung gebracht wird, um die Packungen aufeinanderfolgend jedem der Kanäle (12) zuzuführen und in jedem Kanal (12) eine Reihe von Packungen zu bilden.

6. Verfahren nach einem oder mehreren der vorangehenden Ansprüche,
dadurch gekennzeichnet, dass
die vorverpackten Produkte Rollen aus gewickeltem Bahnmaterial wie Papier sind, vorzugsweise Seidenpapier, wobei die Rollen mit ihren Achsen in einer im Wesentlichen senkrechten Position ausgerichtet sind.

7. Verfahren nach einem oder mehreren der vorangehenden Ansprüche,
gekennzeichnet durch die folgenden Schritte:

- Bilden der Reihen entlang einer Fördervorrichtung (13);
- vorübergehendes Anhalten der Reihen am Ende der Fördervorrichtung (13);
- Festlegen einer führenden Gruppe von zu entladenden Packungen in jeder Reihe, wobei die führende Gruppe eine vorbestimmte Anzahl von Pakkungen in jeder Reihe enthält;
- vorübergehendes Festhalten der Packungen stromaufwärts der führenden Gruppe von Pakkungen;
- während des vorübergehenden Festhaltens der stromaufwärts gelegenen Packungen, Entladen der führenden Gruppe von Packungen von der Fördervorrichtung (13);
- Freigeben und Befördern der stromaufwärts gelegenen Packungen zum Ende der Fördervorrichtung.

8. Verfahren nach Anspruch 7,
dadurch gekennzeichnet, dass
die führende Gruppe von Packungen von der För-

dervorrichtung (13) auf einen ersten Senkrechtförderer (6', 24) entladen wird, und dass, nachdem die führende Gruppe von Packungen von der Fördervorrichtung (13) auf den ersten Senkrechtförderer entladen wurde, die stromaufwärts gelegenen Pakkungen freigegeben und zum Ende der Fördervorrichtung befördert werden.

9. Verfahren nach Anspruch 8,
gekennzeichnet durch
aufeinanderfolgendes Entladen einer Vielzahl von führenden Gruppen von Packungen von der Fördervorrichtung (13), wobei die Vielzahl von führenden Gruppen auf dem ersten Senkrechtförderer aufeinandergeschichtet wird und die geschichteten Gruppen von Packungen in die Verpackungsstation eingebracht werden.

10. Verfahren nach Anspruch 9,
dadurch gekennzeichnet, dass
die geschichteten Gruppen von Packungen von dem ersten Senkrechtförderer (6', 24) direkt an die Ebene der Verpackungsstation (1-5) übergeben werden oder die geschichteten Gruppen von Packungen von dem ersten Senkrechtförderer (6' 24) an einen zweiten Senkrechtförderer (6) übergeben werden, wobei der zweite Senkrechtförderer (6) auf die Ebene der Verpackungsstation (1-5) gehoben wird, um die geschichteten Gruppen von Packungen in die Verpakkungsstation (1-5) zu übergeben, während ein nächster Satz von Gruppen von Pakkungen auf den ersten Senkrechtförderer (6', 24) geschichtet wird.

11. Maschine zum Verpacken von Gruppen von Pakkungen vorverpackter Produkte unterschiedlichen Formats in Beuteln, die von einer von einer Rolle abgewickelten thermoplastischen Folie oder Lage erhalten werden, umfassend eine Fördervorrichtung (13) mit einem Eintrittsende und einem Austrittsende, wobei die Fördervorrichtung (13) benachbarte Kanäle (12) aufweist, wobei die Packungen benachbarte Reihen bilden, die in den Kanälen entlang der Fördervorrichtung laufen; ein Anhalteelement (22; 106) zum vorübergehenden Anhalten der Reihen von Packungen am Ende der Fördervorrichtung (13); einen ersten Senkrechtförderer (6; 6'; 24) zum Sammeln der Reihen von Packungen am Ausgang der Fördervorrichtung (13) und Bewegen der Pakkungen zu einer Verpackungsstation (1-5);
gekennzeichnet dadurch, dass sie weiterhin folgendes umfasst:

- einen auf einer Schwenkachse (111) sich verschwenkenden, zur Aufnahme der Packungen angeordneten Verteilungsförderer (11), wobei der Verteilungsförderer stromabwärts der Fördervorrichtung angeordnet ist;
- eine entlang der Fördervorrichtung (13) mit einem Abstand vom Austrittsende angeordnete Festhalteeinrichtung (16, 17) zum zyklischen Festhalten auf der Fördervorrichtung (13) einer Packung (C1; C2) jeder Reihe, die unmittelbar stromaufwärts der auf den ersten Senkrechtförderer (6; 6', 24) zu entladenden Packung(en) positioniert ist, wenn das Anhalteelement (22; 106) deaktiviert ist.

12. Maschine nach Anspruch 11,
dadurch gekennzeichnet, dass
eine Zuführvorrichtung (10) zum Aufgeben korrekt ausgerichteter und voneinander beabstandeter Pakkungen an den Eintritt des Verteilungsförderers (11) vorgesehen ist, wobei die Zuführvorrichtung an das Format der Pakkungen anpassbar ist; dass der Verteilungsförderer (11) an das Format der Packungen anpassbar ist; dass eine Ausrichtungseinrichtung (8, 8') zum korrekten Ausrichten des Stroms von Pakkungen mit ihren senkrecht ausgerichteten Achsen vorgesehen ist, wobei die Ausrichtungseinrichtung an das Format der Packungen anpassbar ist; dass die Schwenkachse (111) des Verteilungsförderers (11) im Wesentlichen senkrecht ist; und dass die Kanäle (12) auf der Fördervorrichtung (13) an das Format der Packungen und der zu verpackenden Gruppen von Packungen anpassbar sind.

13. Maschine nach Anspruch 11 oder 12,
gekennzeichnet durch
eine Schubvorrichtung (7) zum Übergeben der Gruppen von Packungen in die Verpackungsstation (1-5), wobei sich die Schubvorrichtung (7) in einer im Wesentlichen horizontalen Richtung parallel zur Richtung der Beförderung der Produkte auf der Fördervorrichtung (13) bewegt.

14. Maschine nach Anspruch 13,
dadurch gekennzeichnet, dass
die Ausrichtungseinrichtung (8, 8') ausgebildet und angeordnet ist, um den Packungen (C1; C2) eine Querdrehung von 90° zu verleihen, während sich diese entlang der Ausrichtungseinrichtung vorwärts bewegen.

15. Maschine nach einem oder mehreren der Ansprüche 11 bis 14,
dadurch gekennzeichnet, dass
die Zuführvorrichtung (10) ein Paar motorgetriebener, aufeinander angeordneter Fördereinrichtungen umfasst, die die voneinander beabstandeten Pakkungen (C1, C2) dem nachfolgenden Verteilungsförderer (11) zuführen, wobei der Abstand zwischen den motorbetriebenen Fördereinrichtungen vorzugsweise anpassbar ist.

16. Maschine nach einem oder mehreren der Ansprüche 11 bis 15,

dadurch gekennzeichnet, dass
der Abstand zwischen der Festhalteeinrichtung (16, 17) und dem Ende der Fördervorrichtung (13) anpassbar ist.

17. Maschine nach einem oder mehreren der Ansprüche 11 bis 16,
dadurch gekennzeichnet, dass
die Festhalteeinrichtung (16, 17) ein bewegbares Element (16) umfasst, das sich aus einer eingezogenen Position, in welcher es nicht in die sich entlang der Fördervorrichtung (13) vorwärts bewegenden Packungen eingreift, in eine aktive Position bewegen lässt, in welcher es in die sich entlang der Fördervorrichtung (13) vorwärts bewegenden Packungen eingreift; und dass das bewegbare Element unterhalb eines oberen Abschnitts der Fördervorrichtung (13) einziehbar ist und mit einem festen Element (17) zusammenwirkt, wobei das feste und das bewegbare Element (16, 17) die Packungen festhalten, indem sie die Packungen zwischen sich klemmen.

18. Maschine nach einem oder mehreren der Ansprüche 11 bis 17,
dadurch gekennzeichnet, dass
die Festhalteeinrichtung von einem Schlitten (18) getragen wird, wobei die Position des Schlittens (18) entlang der Fördervorrichtung (13) anpassbar ist.

19. Maschine nach einem oder mehreren der Ansprüche 11 bis 18,
dadurch gekennzeichnet, dass
die Fördervorrichtung (13) einen Zwischenbereich zumindest des oberen Abschnitts aufweist, der auf einer Gruppe paralleler Schleppwalzen (14, 15) geführt ist, um in dem oberen Abschnitt der Fördervorrichtung eine kleine Queröffnung auszubilden, durch die eine Festhalteleiste (16) wirken kann, die durch ein Betätigungselement hoch- und runtergefahren werden kann, um aus der Öffnung hervorzustehen oder nicht hervorzustehen; und dass der untere Abschnitt der Fördervorrichtung auf einer Gruppe paralleler Schleppwalzen (15) geführt ist; dass die Festhalteleiste mit einer parallelen oberen Leiste (17) zusammenwirkt; und dass die obere Leiste (17) vorzugsweise eine anpassbare Position aufweist, derart, dass, wenn sich das Format der Packungen (C1, C2) ändert, die obere Leiste (17) hinsichtlich des Abstandes von der Fördervorrichtung (13) anpassbar ist, um die oberen Enden der sich auf der Fördervorrichtung (13) bewegenden Packungen (C1, C2) im Wesentlichen zu glätten; dass, wenn die Festhalteleiste (16) angehoben wird, diese eine sich oberhalb der Festhalteleiste befindliche Packung gegen die obere Leiste klemmt und die Packung von der Fördervorrichtung (13) hebt, die zum Entladen der Pakkungen stromabwärts derjenigen, die eingeklemmt ist, aktiv bleiben kann, während, wenn die untere Leiste (16) gesenkt ist, sie nicht in den Strom der sich auf dem Transportweg befindenden Packungen eingreift.

20. Maschine nach Anspruch 19,
dadurch gekennzeichnet, dass
die Festhalteleiste (16) und die Schleppwalzen (14, 15) auf einem Schlitten (18) montiert sind, dessen Seiten auf horizontalen Führungen (19) parallel zur Fördervorrichtung (13) laufen; wobei Anpassungsmittel vorgesehen sind, um die Position des Schlittens gegenüber der Fördervorrichtung (13) anzupassen, so dass bei variierendem Format der Pakkungen (C1, C2) die Festhalteleiste (16) stromaufwärts einer Gruppe führender Packungen positioniert ist, die jeder Kanal (12) der Fördervorrichtung (13) zyklisch auf den ersten Senkrechtförderer entladen muss; und wobei die obere Leiste vorzugsweise von dem Schlitten (18) getragen wird.

21. Maschine nach einem oder mehreren der Ansprüche 11 bis 20,
dadurch gekennzeichnet, dass
der erste Senkrechtförderer (6; 6') angeordnet und ausgebildet ist, mindestens eine erste Position auf der Ebene der Fördervorrichtung (13) einzunehmen, Packungen (C1; C2) von der Fördervorrichtung aufzunehmen und eine zweite Position auf der Ebene der Verpackungsstation (1-5) einzunehmen, um die Packungen von dem ersten Senkrechtförderer (6; 6') zur Verpackungsstation (1-5) hin zu entladen; und dass der erste Senkrechtförderer mit einem im Wesentlichen horizontalen Förderer (206) ausgestattet ist.

22. Maschine nach Anspruch 21,
gekennzeichnet durch
eine vorzugsweise feststehende, an der stromabwärts gelegenen Seite des ersten Senkrechtförderers (6; 6') angeordnete Anschlagwand (20; 25'), von der die Pakkungen (C1; C2) bei der Übergabe auf den ersten Senkrechtförderer (6; 6') angehalten und ausgerichtet werden; und dass das Anhalteelement eine mit dem ersten Senkrechtförderer (6) einstückig ausgeführte Anschlagwand (106) aufweist, die sich an der stromaufwärts gelegenen Seite desselben nach unten von diesem erstreckt und der Fördervorrichtung (13) zugewandt ist; wobei, wenn sich der erste Senkrechtförderer (6) nach oben bewegt, um die Lage von Packungen (C1) auf die Höhe der Verpackungsstation (1-5) zu übergeben, die Anschlagwand (106) den Strom von Packungen (C1) auf der Fördervorrichtung (13) anhält.

23. Maschine nach einem oder mehreren der Ansprüche 11 bis 21,
dadurch gekennzeichnet, dass

das Anhalteelement eine am Austrittsende der Fördervorrichtung (13) angeordnete bewegbare Auffangeinrichtung (22) aufweist, wobei eine motorbetriebene Beförderungseinrichtung (23) vorzugsweise stromabwärts der Auffangeinrichtung (22) und stromaufwärts des ersten Senkrechtförderers (6; 24) angeordnet ist, wobei die Beförderungseinrichtung ausgebildet und gesteuert ist, um die Packungen (C2) vorwärts gerichtet zu übergeben, mit einer Geschwindigkeit, die ausreicht, damit sie korrekt auf dem ersten Senkrechtförderer (6'; 24) bzw. auf einer zuvor auf dem Senkrechtförderer abgelegten Lage von Packungen abgelegt werden.

24. Maschine nach Anspruch 23,
dadurch gekennzeichnet, dass
die motorbetriebene Beförderungseinrichtung ein Paar übereinander angeordneter paralleler Rollen oder kurzer Fördermittel (23) aufweist, wobei der Abstand zwischen diesen an das Format der Packungen (C2) anpassbar ist; und dass ein Anschlag (25; 25') stromabwärts des ersten Senkrechtförderers angeordnet ist, um die durch die Beförderungseinrichtung (23) von der Fördervorrichtung (13) auf den ersten Senkrechtförderer (6'; 24) übergebenen Pakkungen anzuhalten.

25. Maschine nach einem oder mehreren der Ansprüche 11 bis 24,
dadurch gekennzeichnet, dass
der erste Senkrechtförderer (6, 24) ein Fördermittel bestehend aus parallelen Bändern (124, 306') aufweist, die zur Vorwärtsbewegung der Packungen (C1; C2) angesteuert sind und stromabwärts in einer kammartigen Ausbildung enden, so dass senkrechte Zinken eines Kamms (25, 25' zwischen den parallelen Bändern positionierbar sind, um die Packungen auf dem Senkrechtförderer korrekt gestapelt anzuhalten; dass der Kamm (25) mit Hebe- und Senkungsmitteln verbunden ist; dass ein zweiter Senkrechtförderer (6) vorgesehen ist, der stromabwärts des ersten Senkrechtförderers (6', 24) in Richtung der Beförderung der Packungen (C1; C2) angeordnet ist, dass die Fördervorrichtung (13), das Anhalteelement (22), die Festhalteeinrichtung (16, 17), der erste Senkrechtförderer (6', 24) und der zweite Senkrechtförderer (6) derart angeordnet und angesteuert sind, dass, wenn eine erforderliche Gruppe von geschichteten Packungen (C2) auf dem ersten Senkrechtförderer (6', 24) gebildet worden ist, der erste Senkrechtförderer (6', 24) auf derselben Höhe wie der zweite Senkrechtförderer (6) platziert wird und die Gruppe von geschichteten Packungen von dem ersten Senkrechtförderer (6', 24) an den zweiten Senkrechtförderer (6) übergeben wird, so dass, während der zweite Senkrechtförderer (6) die Gruppe von Packungen (C2) an die Verpackungsstation (1-5) übergibt, der erste Senkrechtförderer (6', 24) auf die Ebene des Austrittsendes der Fördervorrichtung (13) zur Aufnahme eine neuen Gruppe von Pakkungen (C2) verbracht wird; und dass der Kamm (25) mit dem ersten Senkrechtförderer (6', 24) verbunden und synchron mit diesem bewegt wird, derart, dass der Kamm (25) gesenkt wird, um die Übergabe der Packungen (C2) von dem ersten Senkrechtförderer (6', 24) an den zweiten Senkrechtförderer (6) zu ermöglichen, und wieder angehoben wird, wenn der erste Senkrechtförderer (6', 24) zurück auf die Ebene des Austritts der Fördervorrichtung verbracht wird.

26. Maschine nach Anspruch 25,
dadurch gekennzeichnet, dass
der Kamm (25) sich in einer festen Position befindet und die Fördervorrichtung (13) mit ihrem Austritt in einem Abstand von der Verpackungsstation (1-5) positioniert wird, der gleich oder geringfügig größer ist als die Höhe eines der zu verpackenden Beutel ist, wobei die Fördervorrichtung (13) vorzugsweise in einer in Längsrichtung geneigten Position positioniert ist.

27. Maschine nach Anspruch 26,
dadurch gekennzeichnet, dass
diese Anpassungsmittel aufweist, so dass es mit variierender Höhe der zu verpackenden Packungen (C1, C2) möglich ist, die Neigung der Fördervorrichtung (13) zum Heben oder Senken ihres Austritts zu verändern, und dass das dem Austritt zugeordnete Anhalteelement (22) auf einer konstanten Höhe gehalten wird, und dass die Festhaltevorrichtung vorzugsweise eine Gegenanschlagsleiste (17) aufweist, die auf konstanter Höhe gehalten wird, wenn sich die Höhe der Packungen ändert.

28. Maschine nach einem oder mehreren der Ansprüche 11 bis 27,
dadurch gekennzeichnet, dass
Mittel zum Setzen des Verteilungsförderers (11) auf eine feste Position vorgesehen sind, zum Zuführen eines Produktstroms an nur einen der Kanäle (12) der Fördervorrichtung (13).

Revendications

1. Procédé d'ensachage de groupes d'emballages de produits conditionnés, de format variable, dans des sacs obtenus à partir d'un film ou d'un feuil thermoplastique dévidé d'une bobine, **caractérisé par** les étapes suivantes :

- dépôt d'emballages sur un convoyeur d'avance (13), par un convoyeur de distribution (11) qui pivote sur un axe oscillant (111) ;
- délivrance d'emballages à orientation correcte,

le long d'un nombre de rangées préétabli, dans des canaux (12) dudit convoyeur d'avance (13) ;
- décharge et regroupement, sur un élévateur (6, 6', 24), d'un nombre préétabli d'emballages provenant de chacune desdites rangées, cependant que les emballages, situés en amont de ceux déchargés sur ledit élévateur (6, 6', 24), sont arrêtés par un dispositif de retenue (16, 17) installé le long dudit convoyeur d'avance (13), à distance d'une extrémité de sortie, afin d'immobiliser l'intégralité du flux d'emballages situés en amont ;
- soulèvement des emballages regroupés, jusqu'à la hauteur d'un poste d'ensachage (1-5) ;
- transfert desdits emballages regroupés audit poste d'ensachage (1-5), et introduction desdits emballages regroupés dans un film thermoplastique d'enveloppement tubulaire ;
- formation d'un sac à l'aide dudit film d'enveloppement tubulaire.

2. Procédé selon la revendication 1, **caractérisé par le fait que** lesdits emballages regroupés sur ledit élévateur (6, 6', 24) sont mus, par ledit élévateur, jusqu'à la hauteur dudit poste d'ensachage (1-5), puis transférés dans un tube d'enveloppement dudit poste d'ensachage (1-5), à partir dudit élévateur (6, 6', 24), par un poussoir (7) qui se meut pour l'essentiel parallèlement à la direction d'avance desdites rangées de produits.

3. Procédé selon la revendication 1 ou 2, **caractérisé par le fait que** lesdits emballages sont regroupés suivant une pluralité de couches superposées ; et **par le fait que** lesdites couches d'emballages superposées sont transférées dans ledit poste d'ensachage (1-5).

4. Procédé selon la revendication 1, **caractérisé par le fait que** lesdits emballages sont regroupés, sur ledit élévateur (6', 24), suivant une pluralité de couches superposées ; et **par le fait que** lesdites couches d'emballages superposées sont transférées à un élévateur additionnel (6) à partir dudit élévateur (6', 24), ledit élévateur additionnel (6) déplaçant lesdites couches d'emballages superposées à la hauteur dudit poste d'ensachage (1-5).

5. Procédé selon l'une ou plusieurs des revendications précédentes, **caractérisé par le fait que** lesdits emballages sont délivrés le long d'un convoyeur de distribution (11) et répartis suivant une pluralité de rangées sensiblement parallèles, ledit convoyeur de distribution (11) étant animé de pivotements autour d'un axe oscillant (111) implanté sur un côté admission dudit convoyeur de distribution (11), de telle sorte qu'un côté sortie dudit convoyeur de distribution (11) soit séquentiellement amené dans l'alignement d'une pluralité de canaux (12) sensiblement parallèles, afin de délivrer séquentiellement lesdits emballages à chacun desdits canaux (12), et de former une rangée d'emballages dans chaque canal (12) précité.

6. Procédé selon l'une ou plusieurs des revendications précédentes, **caractérisé par le fait que** lesdits produits conditionnés sont des rouleaux de matériau en nappes enroulé, tel que du papier et, de préférence, un papier mousseline, lesdits rouleaux étant orientés, dans lesdites rangées, de façon telle que leurs axes occupent une position sensiblement verticale.

7. Procédé selon l'une ou plusieurs des revendications précédentes, **caractérisé par** les étapes suivantes :

- formation desdites rangées le long d'un convoyeur d'avance (13) ;
- immobilisation provisoire desdites rangées à l'extrémité dudit convoyeur d'avance (13) ;
- définition, dans chaque rangée, d'un groupe frontal d'emballages devant être déchargés, ledit groupe frontal comptant un nombre d'emballages préétabli dans chaque rangée ;
- retenue provisoire des emballages situés en amont dudit groupe frontal d'emballages ;
- concomitamment à la retenue provisoire desdits emballages situés en amont, décharge dudit groupe frontal d'emballages à partir dudit convoyeur d'avance (13) ;
- libération et avance desdits emballages situés en amont, en direction de l'extrémité dudit convoyeur d'avance.

8. Procédé selon la revendication 7, **caractérisé par le fait que** ledit groupe frontal d'emballages est déchargé sur un premier élévateur (6' ; 24) à partir dudit convoyeur d'avance (13) et, après que ledit groupe frontal d'emballages a été déchargé sur ledit premier élévateur, à partir dudit convoyeur d'avance (13), lesdits emballages situés en amont sont libérés et avancés en direction de l'extrémité dudit convoyeur d'avance.

9. Procédé selon la revendication 8, **caractérisé par** la décharge séquentielle d'une pluralité de groupes frontaux d'emballages, à partir dudit convoyeur d'avance (13), ladite pluralité de groupes frontaux étant empilée en superposition, sur ledit premier élévateur, lesdits groupes d'emballages empilés étant introduits dans ledit poste d'ensachage.

10. Procédé selon la revendication 9, **caractérisé par le fait que** lesdits groupes d'emballages empilés sont transférés directement par ledit premier élévateur (6', 24), au niveau dudit poste d'ensachage (1-5), ou bien lesdits groupes d'emballages empilés

sont transférés à un second élévateur (6), à partir dudit premier élévateur (6', 24), ledit second élévateur (6) étant soulevé au niveau dudit poste d'ensachage (1-5), afin de transférer les groupes d'emballages empilés dans ledit poste d'ensachage (1-5), cependant qu'un lot successif de groupes d'emballages est empilé sur ledit premier élévateur (6', 24).

11. Machine d'ensachage de groupes d'emballages de produits conditionnés, de format variable, dans des sacs obtenus à partir d'un film ou d'un feuil thermoplastique dévidé d'une bobine, comprenant : un convoyeur d'avance (13) muni d'une extrémité d'admission et d'une extrémité de sortie, ledit convoyeur d'avance (13) étant pourvu de canaux adjacents (12), lesdits emballages formant des rangées adjacentes défilant dans lesdits canaux, le long dudit convoyeur d'avance ; un organe d'arrêt (22 ; 106) conçu pour immobiliser provisoirement les rangées d'emballages à l'extrémité dudit convoyeur d'avance (13) ; un premier élévateur (6 ; 6' ; 24) conçu pour collecter les rangées d'emballages à la sortie dudit convoyeur d'avance (13), et pour mouvoir lesdits emballages vers un poste d'ensachage (1-5) ; **caractérisée par le fait qu'**elle comprend, en outre :

- un convoyeur de distribution (11) qui pivote sur un axe oscillant (111), agencé pour recevoir lesdits emballages, ledit convoyeur d'avance étant installé en aval dudit convoyeur de distribution ;
- un dispositif de retenue (16, 17) implanté le long dudit convoyeur d'avance (13) à distance de ladite extrémité de sortie, afin de retenir cycliquement, sur ledit convoyeur d'avance (13), un emballage (C1 ; C2) de chaque rangée qui occupe une position située immédiatement en amont du ou des emballage(s) devant être déchargé(s), sur ledit premier élévateur (6 ; 6' ; 24), lorsque ledit organe d'arrêt (22 ; 106) est désactivé.

12. Machine selon la revendication 11, **caractérisée par le fait qu'**un alimentateur (10) est prévu pour délivrer des emballages, correctement orientés et espacés les uns des autres, à l'admission dudit convoyeur de distribution (11), ledit alimentateur pouvant être réglé en concordance avec le format desdits emballages ; **par le fait que** ledit convoyeur de distribution (11) peut être réglé en concordance avec le format desdits emballages ; **par le fait qu'**un dispositif d'orientation (8, 8') est prévu pour orienter correctement le flux d'emballages de manière que leurs axes soient orientés verticalement, ledit dispositif d'orientation pouvant être réglé en concordance avec le format desdits emballages ; **par le fait que** ledit axe oscillant (111) dudit convoyeur de distribution (11) est pour l'essentiel vertical ; et **par le fait que** lesdits canaux (12), situés sur ledit convoyeur d'avance (13), peuvent être réglés en concordance avec le format desdits emballages et desdits groupes d'emballages devant être ensachés.

13. Machine selon la revendication 11 ou 12, **caractérisée par** un poussoir (7) dévolu au transfert desdits groupes d'emballages dans ledit poste d'ensachage (1-5), ledit poussoir (7) se mouvant dans une direction sensiblement horizontale, parallèle à la direction d'avance des produits sur ledit convoyeur d'avance (13).

14. Machine selon la revendication 13, **caractérisée par le fait que** ledit dispositif d'orientation (8, 8') est conçu et agencé pour imprimer une rotation transversale de 90° auxdits emballages (C1 ; C2) lorsqu'ils avancent le long dudit dispositif d'orientation.

15. Machine selon l'une ou plusieurs des revendications 11 à 14, **caractérisée par le fait que** ledit alimentateur (10) offre une paire de dispositifs de convoyage à entraînement motorisé, placés l'un au-dessus de l'autre, qui délivrent lesdits emballages (C1, C2), mutuellement distants, au convoyeur de distribution (11) situé dans la continuité, la distance séparant lesdits dispositifs de convoyage à entraînement motorisé pouvant, de préférence, être réglée.

16. Machine selon l'une ou plusieurs des revendications 11 à 15, **caractérisée par** la faculté de réglage de la distance comprise entre ledit dispositif de retenue (16, 17) et l'extrémité dudit convoyeur d'avance (13).

17. Machine selon l'une ou plusieurs des revendications 11 à 16, **caractérisée par le fait que** ledit dispositif de retenue (16, 17) présente une pièce mobile (16) pouvant être déplacée depuis une position rétractée, dans laquelle elle n'interfère pas avec les emballages progressant le long dudit convoyeur d'avance (13), vers une position opérante dans laquelle elle interfère avec les emballages progressant le long dudit convoyeur d'avance (13) ; et **par le fait que** ladite pièce mobile peut être rétractée au-dessous d'un brin supérieur dudit convoyeur d'avance (13) et coopère avec une pièce fixe (17), lesdites pièces mobile et fixe (16, 17) retenant les emballages en pinçant lesdits emballages entre elles.

18. Machine selon l'une ou plusieurs des revendications 11 à 17, **caractérisée par le fait que** ledit dispositif de retenue est supporté par un chariot (18), la position dudit chariot (18) étant réglable le long dudit convoyeur d'avance (13).

19. Machine selon l'une ou plusieurs des revendications 11 à 18, **caractérisée par le fait qu'**une région intermédiaire d'au moins le brin supérieur dudit convoyeur d'avance (13) est guidée sur un ensemble

de galets fous parallèles (14, 15) en vue de former, dans le brin supérieur dudit convoyeur, un petit orifice transversal à travers lequel peut opérer une barrette de retenue (16) pouvant être soulevée et abaissée, par un élément d'actionnement, de manière à faire saillie ou à ne pas faire saillie au-delà dudit orifice ; **par le fait que** le brin inférieur dudit convoyeur d'avance est guidé sur un ensemble de galets fous parallèles (15) ; **par le fait que** ladite barrette de retenue coopère avec une barrette supérieure parallèle (17) ; et **par le fait que** ladite barrette supérieure (17) occupe une position de préférence réglable de façon telle que, lorsque le format des emballages (C1, C2) varie, ladite barrette supérieure (17) puisse être réglée quant à la distance la séparant d'avec le convoyeur d'avance (13), afin d'effleurer sensiblement les sommets des emballages (C1, C2) en mouvement sur ledit convoyeur d'avance (13) ; lorsque ladite barrette de retenue (16) est soulevée, ladite barrette de retenue pince, contre ladite barrette supérieure (17), un emballage placé au-dessus de ladite barrette de retenue, soulevant ainsi ledit emballage à l'écart du convoyeur (13) pouvant demeurer opérant pour décharger les emballages en aval de celui ayant été pincé, tandis que, lorsque ladite barrette inférieure (16) est abaissée, elle n'interfère pas avec le flux d'emballages en transit.

20. Machine selon la revendication 19, **caractérisée par le fait que** ladite barrette de retenue (16) et lesdits galets fous (14, 15) sont montés sur un chariot (18) dont les côtés se meuvent sur des guides horizontaux (19), parallèlement au convoyeur d'avance (13) ; des moyens de réglage étant prévus pour régler la position dudit chariot vis-à-vis dudit convoyeur d'avance (13) de façon telle que, lorsque le format des emballages (C1, C2) varie, ladite barrette de retenue (16) soit placée en amont d'un groupe conduisant des emballages que chaque canal (12) du convoyeur d'avance (13) doit décharger cycliquement sur ledit premier élévateur ; sachant que ladite barrette supérieure est, de préférence, supportée par ledit chariot (18).

21. Machine selon l'une ou plusieurs des revendications 11 à 20, **caractérisée par le fait que** ledit premier élévateur (6 ; 6') est conçu et agencé de manière à prendre au moins une première position au niveau dudit convoyeur d'avance (13), afin de recevoir des emballages (C1 ; C2) provenant dudit convoyeur, et une seconde position au niveau dudit poste d'ensachage (1-5), afin de décharger lesdits emballages à partir dudit premier élévateur (6 ; 6'), en direction dudit poste d'ensachage (1-5) ; et **par le fait que** ledit premier élévateur est équipé d'un convoyeur (206) sensiblement horizontal.

22. Machine selon la revendication 21, **caractérisée par** une paroi de butée (20 ; 25') de préférence fixe, implantée du côté aval dudit premier élévateur (6 ; 6'), contre laquelle lesdits emballages (C1 ; C2) sont arrêtés et alignés lorsqu'ils sont transférés sur ledit premier élévateur (6 ; 6') ; et par le fait que ledit organe d'arrêt comprend une paroi de butée (106) faisant corps avec ledit premier élévateur (6), s'étendant vers le bas au-delà de ce dernier sur son côté amont, et pointant vers ledit convoyeur d'avance (13) ; ladite paroi de butée (106) immobilisant le flux d'emballages (C1), sur ledit convoyeur d'avance (13), lorsque ledit élévateur (6) se meut vers le haut pour amener les couches d'emballages (C1) à la hauteur du poste d'ensachage (1-5).

23. Machine selon l'une ou plusieurs des revendications 11 à 21, **caractérisée par le fait que** ledit organe d'arrêt comprend un dispositif mobile d'interception (22) installé à l'extrémité de sortie dudit convoyeur d'avance (13), un dispositif de progression (23) à entraînement motorisé étant, de préférence, implanté en aval dudit dispositif d'interception (22) et en amont dudit premier élévateur (6' ; 24), ledit dispositif de progression étant agencé et commandé de manière à transférer les emballages (C2) vers l'avant, à une vitesse suffisante pour les déposer correctement sur ledit premier élévateur (6', 24), ou sur une couche d'emballages antérieurement déposée sur ledit élévateur.

24. Machine selon la revendication 23, **caractérisée par le fait que** ledit dispositif de progression à entraînement motorisé offre une paire de rouleaux ou de convoyeurs courts (23) parallèles, placés l'un au-dessus de l'autre, la distance entre ces derniers étant réglable en concordance avec le format des emballages (C2) ; et **par le fait qu'**une butée (25 ; 25') est implantée en aval dudit premier élévateur afin d'immobiliser les emballages transférés, par ledit dispositif de progression (23), sur ledit premier élévateur (6' ; 24) à partir dudit convoyeur d'avance (13).

25. Machine selon l'une ou plusieurs des revendications 11 à 24, **caractérisée par le fait que** ledit premier élévateur (6', 24) présente un convoyeur constitué par des courroies parallèles (124, 306'), commandées afin de mouvoir les emballages (C1 ; C2) vers l'avant et s'achevant, en aval, par une configuration de type peigne, de façon telle que des dents verticales d'un peigne (25, 25') puissent être interposées entre lesdites courroies parallèles, pour immobiliser les emballages correctement empilés sur ledit élévateur ; **par le fait que** ledit peigne (25) est relié à des moyens de levage et d'abaissement ; **par le fait qu'**il est prévu un second élévateur (6) installé en aval dudit premier élévateur (6', 24), dans la direction d'avance desdits emballages (C1, C2) ; **par**

le fait que ledit convoyeur d'avance (13), ledit organe d'arrêt (22), ledit dispositif de retenue (16, 17), ledit premier élévateur (6', 24) et ledit second élévateur (6) sont agencés et commandés de façon telle que, lorsqu'un groupe requis d'emballages empilés (C2) a été formé sur le premier élévateur (6', 24), ledit premier élévateur (6', 24) soit placé à la même hauteur que le second élévateur (6), et que ledit groupe d'emballages empilés soit transféré audit second élévateur (6) à partir dudit premier élévateur (6', 24), si bien que, au cours du transfert du groupe d'emballages (C2) au poste d'ensachage (1-5), effectué par le second élévateur (6), le premier élévateur (6', 24) est amené au niveau de l'extrémité de sortie dudit convoyeur d'avance (13), de manière à recevoir un nouveau groupe d'emballages (C2) ; et **par le fait que** ledit peigne (25) est combiné audit premier élévateur (6', 24) et est mû en synchronisme avec ce dernier, de telle sorte que ledit peigne (25) soit abaissé pour autoriser un transfert desdits emballages (C2) audit second élévateur (6), à partir dudit premier élévateur (6', 24), et soit de nouveau soulevé lorsque ledit premier élévateur (6', 24) est ramené au niveau de la sortie dudit convoyeur d'avance (13).

26. Machine selon la revendication 25, **caractérisée par le fait que** ledit peigne (25') occupe une position fixe et le convoyeur d'avance (13) est placé de manière que sa sortie soit espacée, du poste d'ensachage (1-5), d'une distance égale ou légèrement supérieure à la hauteur de l'un des sacs devant être emballés, ledit convoyeur d'avance (13) étant placé, de préférence, dans une position décrivant une pente dans le sens longitudinal.

27. Machine selon la revendication 26, **caractérisée par le fait qu'**elle comprend des moyens de réglage propres à permettre, en cas de variation de la hauteur des emballages (C1, C2) à ensacher, une modification de l'inclinaison dudit convoyeur d'avance (13) en vue de soulever ou d'abaisser la sortie de ce dernier ; **par le fait que** ledit organe d'arrêt (22), associé à ladite sortie, est maintenu à une hauteur constante ; et **par le fait que** ledit dispositif de retenue comporte, de préférence, une barrette de contre-butée (17) qui est maintenue à une hauteur constante lorsque la hauteur desdits emballages varie.

28. Machine selon l'une quelconque ou plusieurs des revendications 11 à 27, **caractérisée par le fait que** des moyens sont prévus pour assigner une position fixe audit convoyeur de distribution (11), de manière à délivrer un flux de produits à seulement l'un des canaux (12) dudit convoyeur d'avance (13).

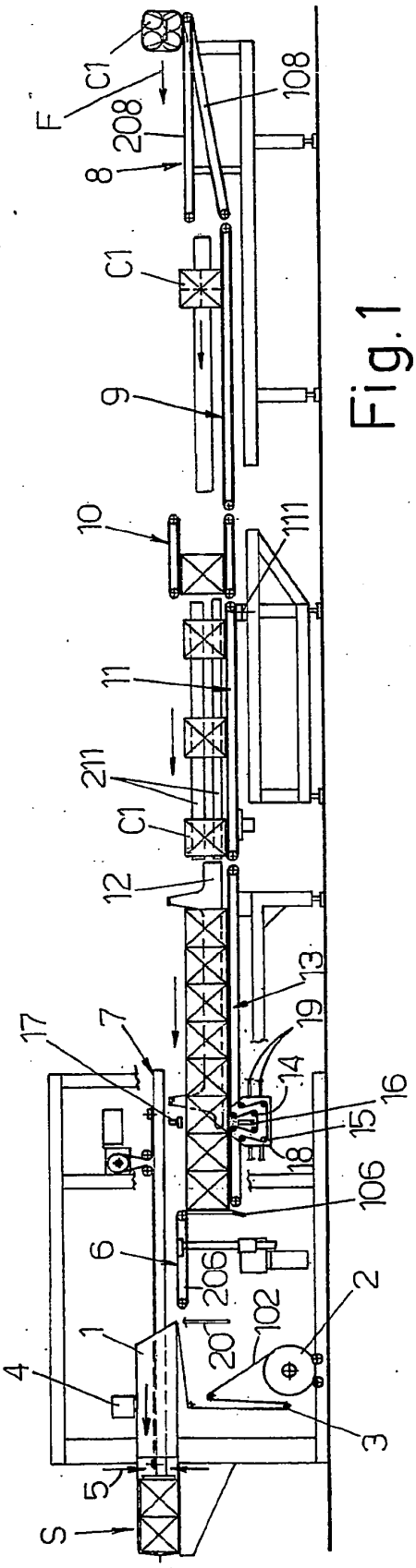

F
C1
208
8
108
C1
9
10
111
11
211
C1
12
13
19
14
16
15
18
17
7
106
6
206
102
201
2
1
4
3
5
S

Fig.1

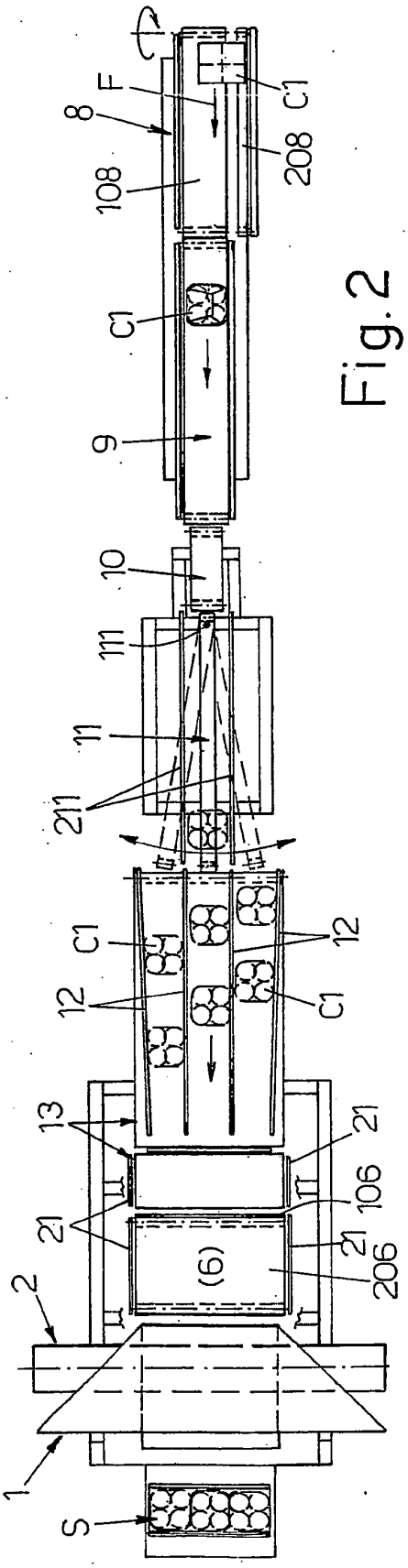

F
C1
8
208
108
C1
9
10
111
11
211
C1
12
12
C1
13
21
106
21
21
(6)
21
206
2
1
S

Fig.2

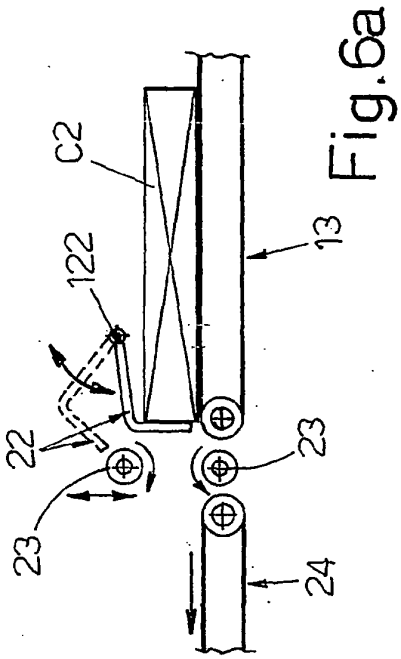


Fig.6a

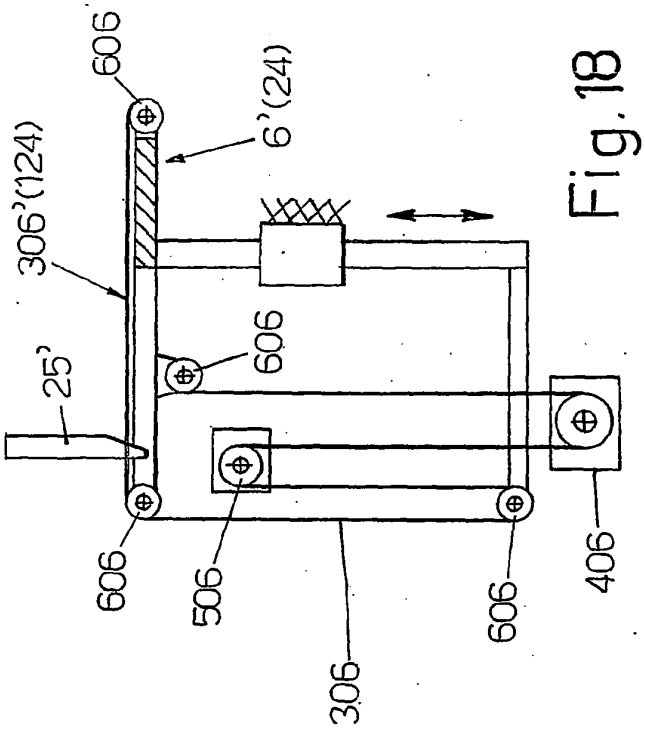


Fig.18

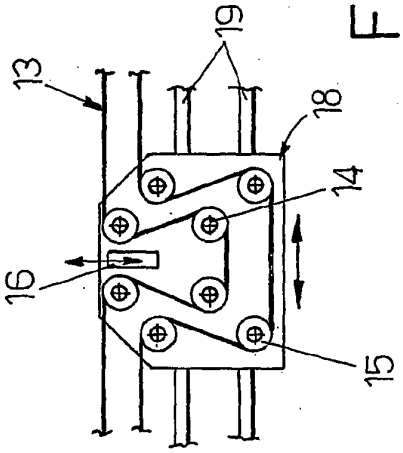


Fig.1a

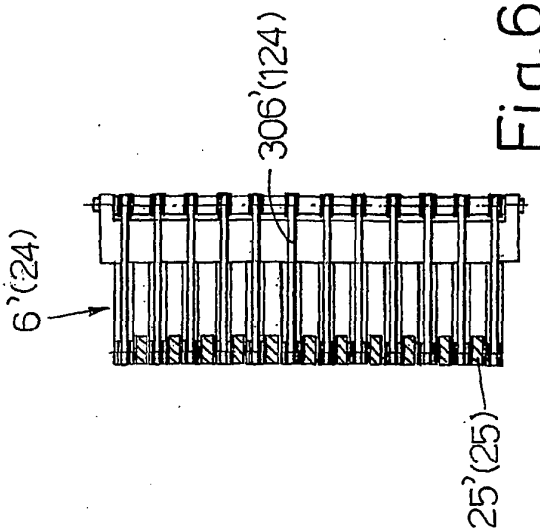


Fig.6b

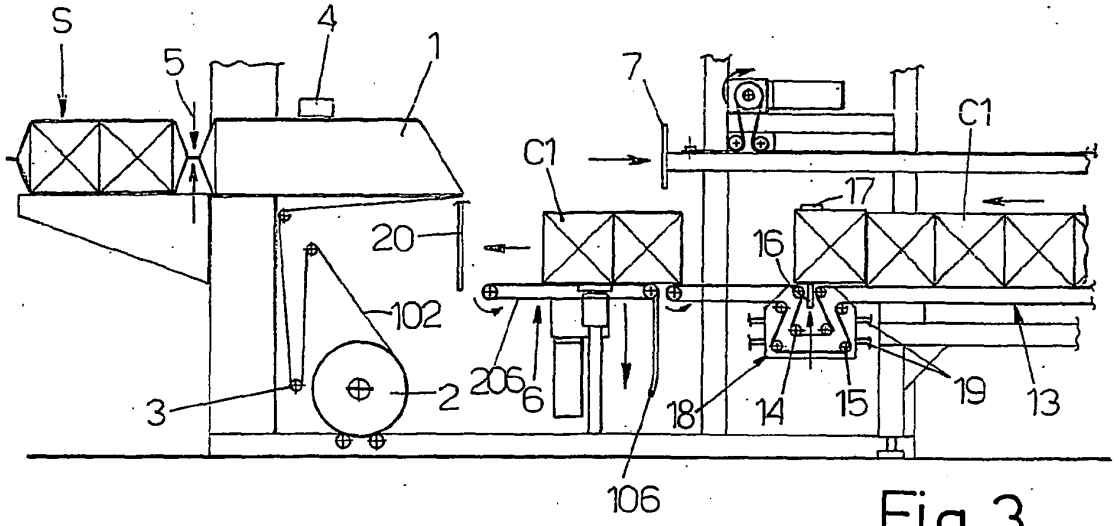


Fig.3

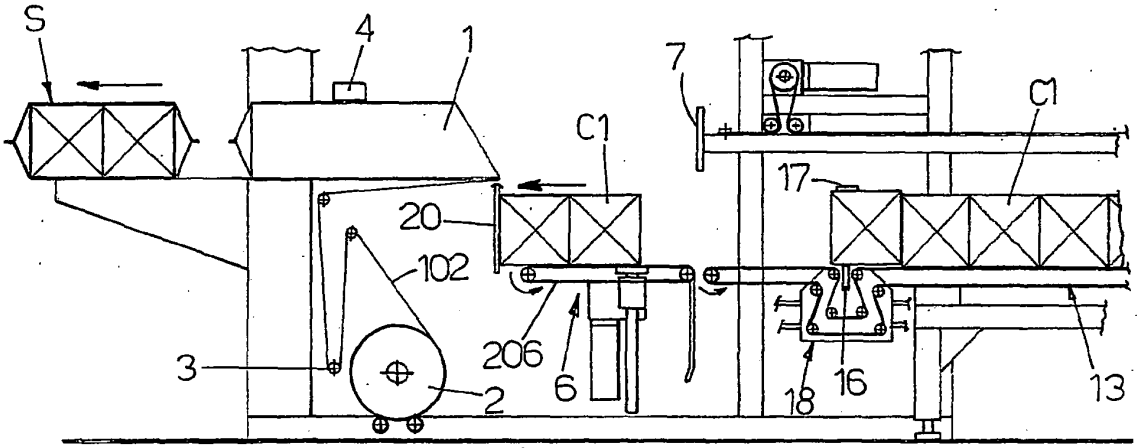


Fig.4

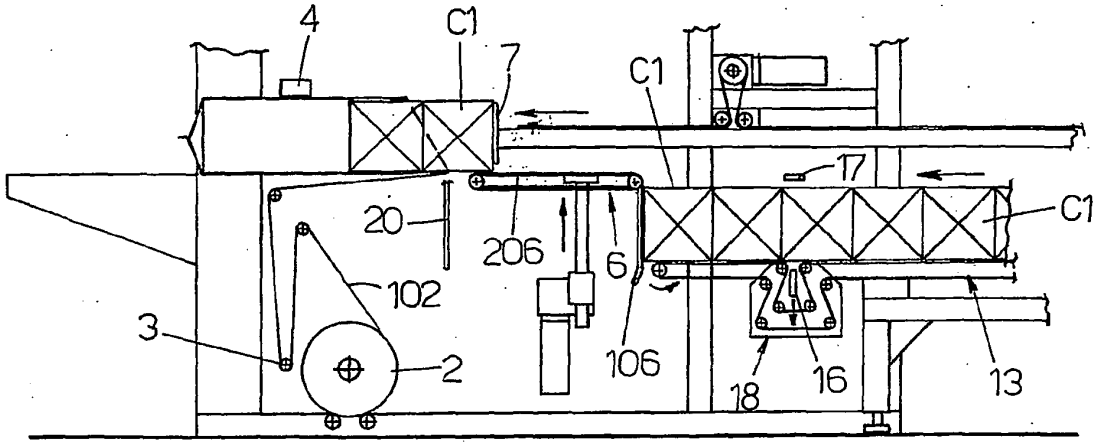


Fig.5

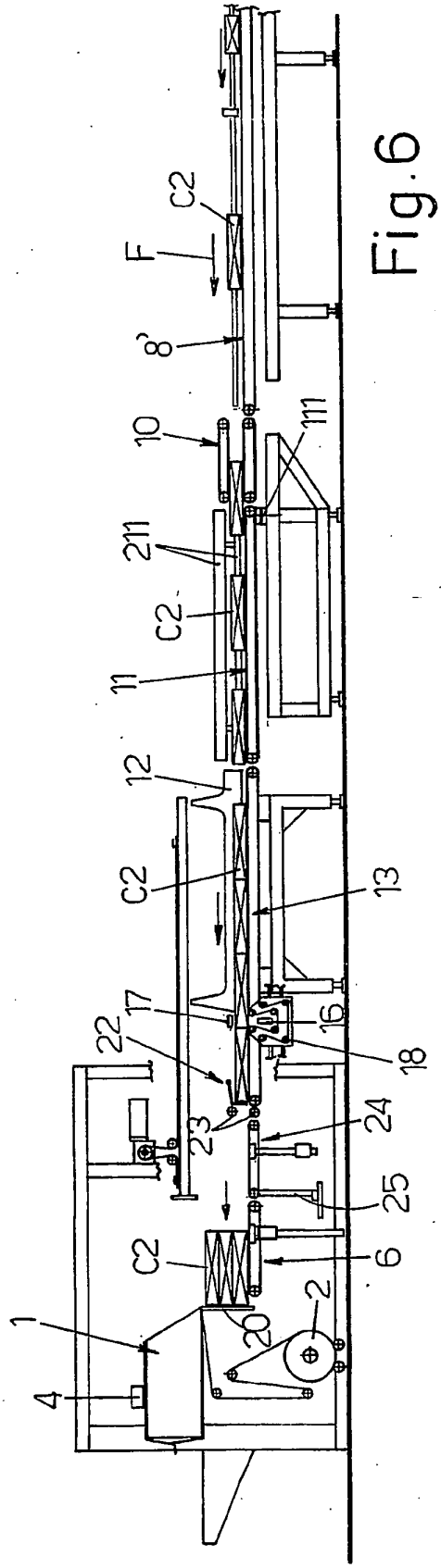

C2
F
8'
10
111
211
C2
11
12
C2
13
17
16
22
18
23
24
25
C2
6
20
2
1
4

Fig.6

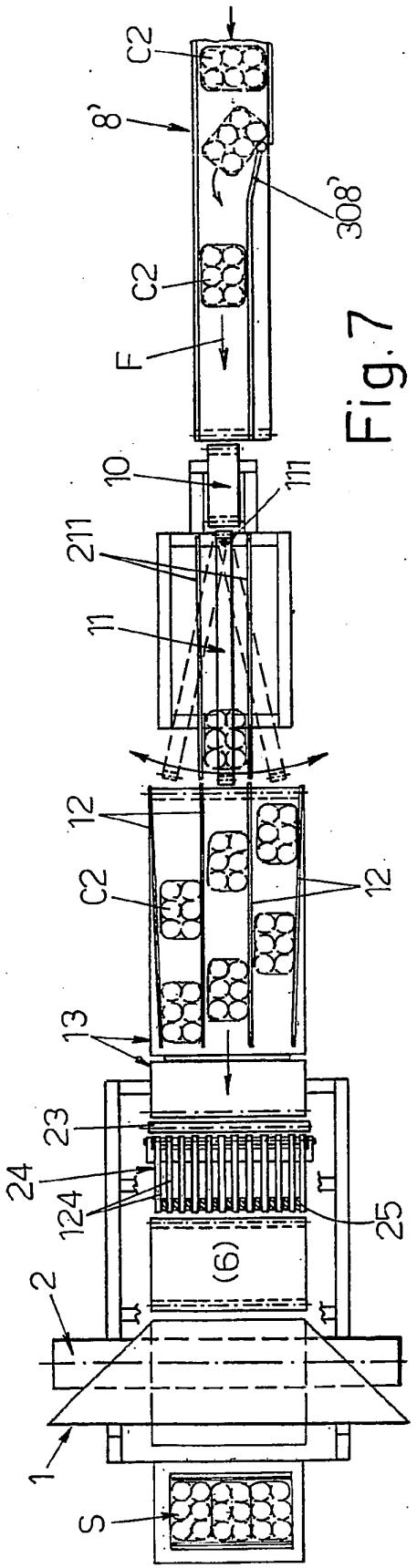

C2
8'
308'
C2
F
10
111
211
11
12
C2
12
13
23
24
124
25
(6)
2
1
S

Fig.7

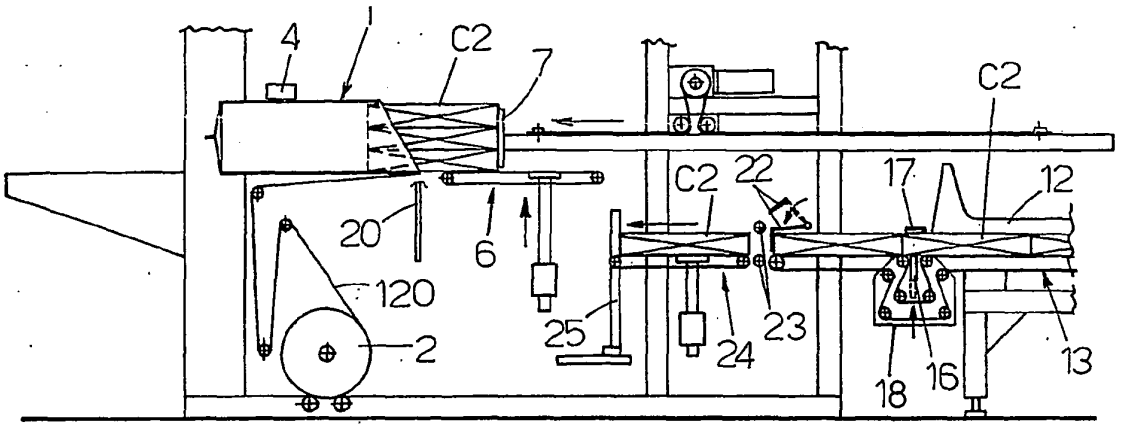


Fig.8

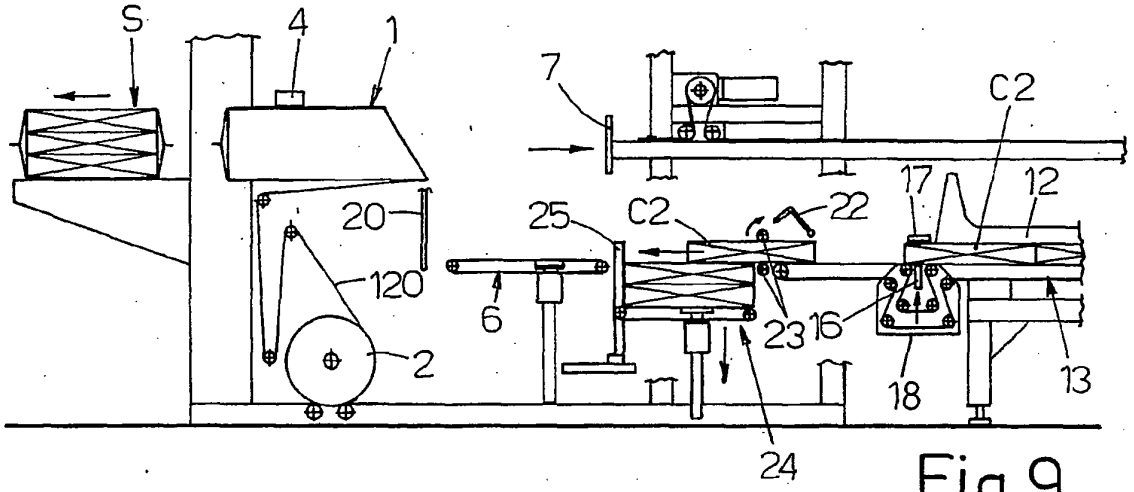


Fig.9

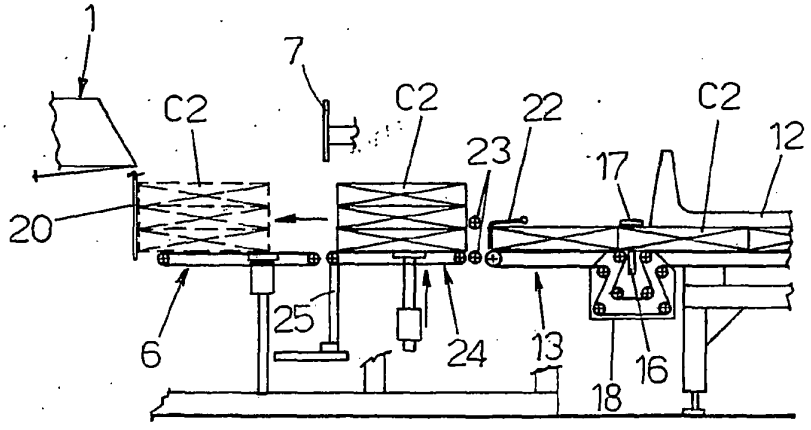


Fig.10

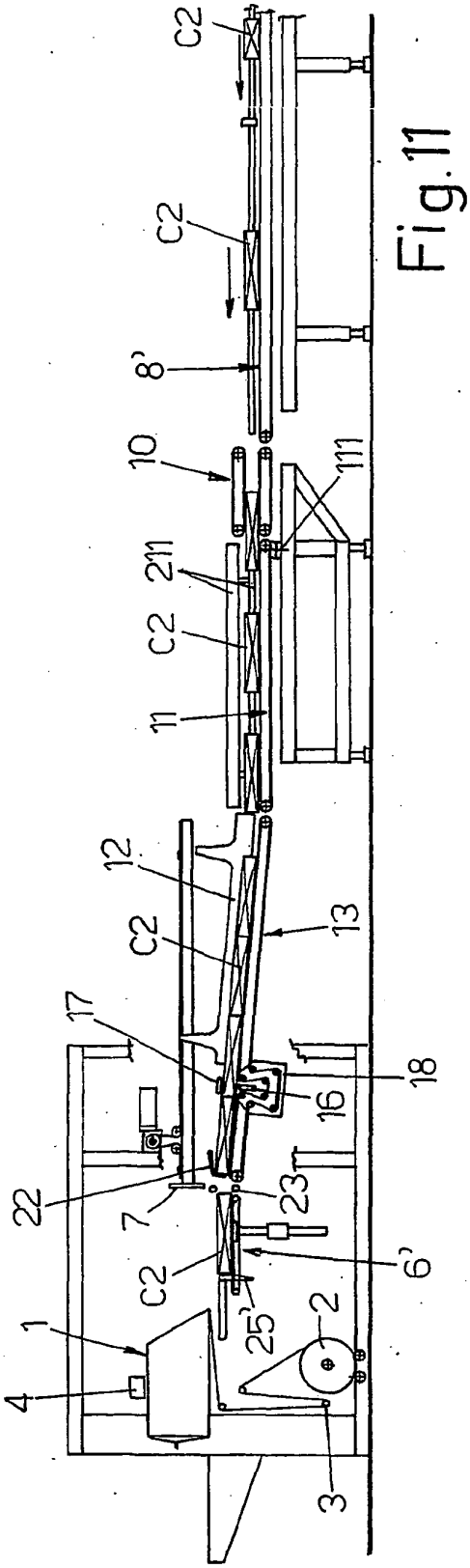

C2
C2
8'
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111
211
C2
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C2
13
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22
7
23
C2
6'
25'
1
2
4
3

Fig.11

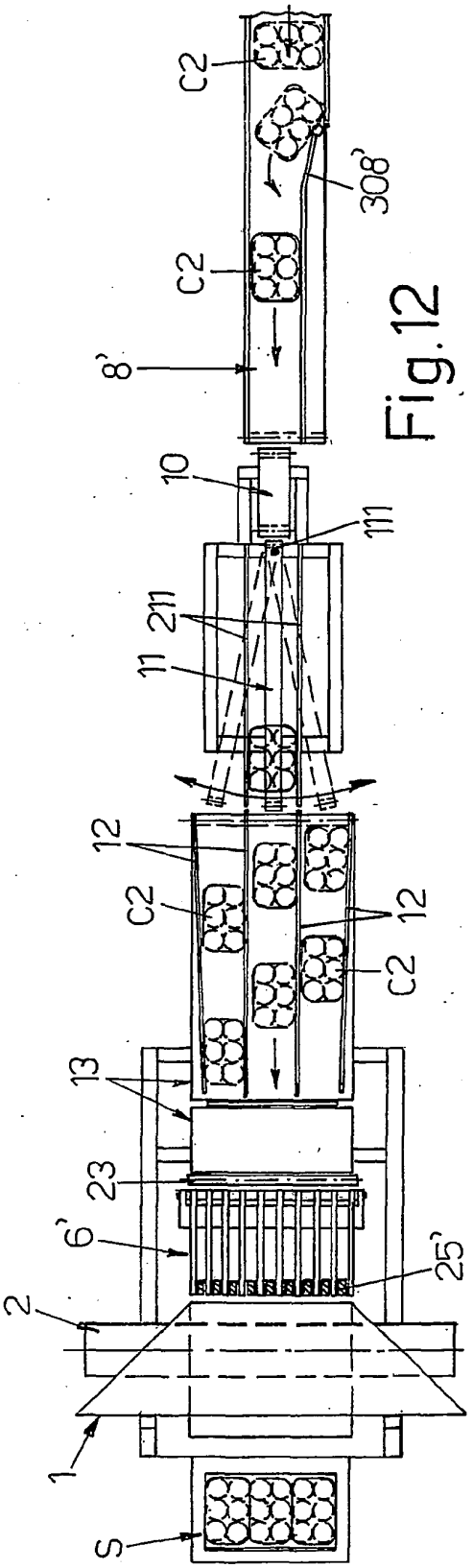

C2
308'
C2
8'
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C2
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C2
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6'
25'
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S

Fig.12

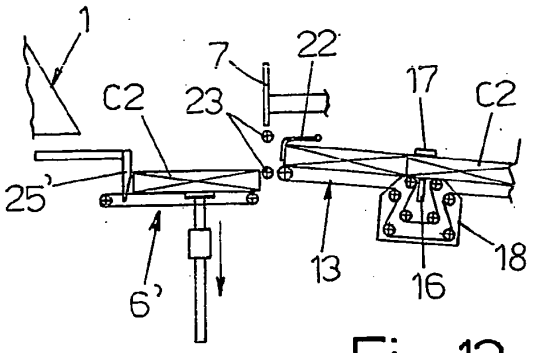


Fig.13

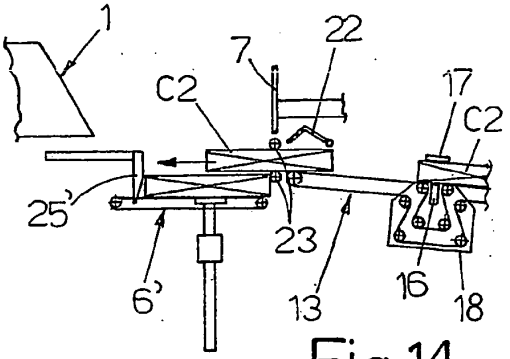


Fig.14

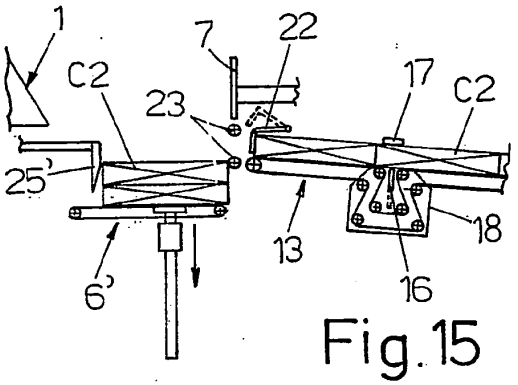


Fig.15

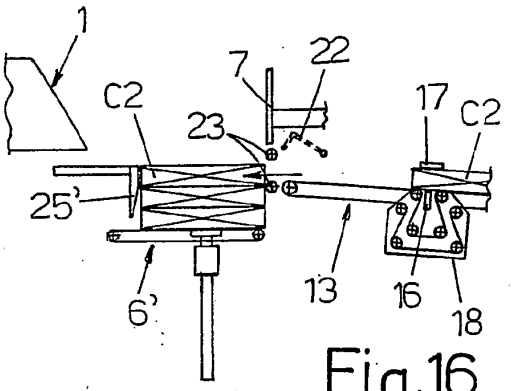


Fig.16

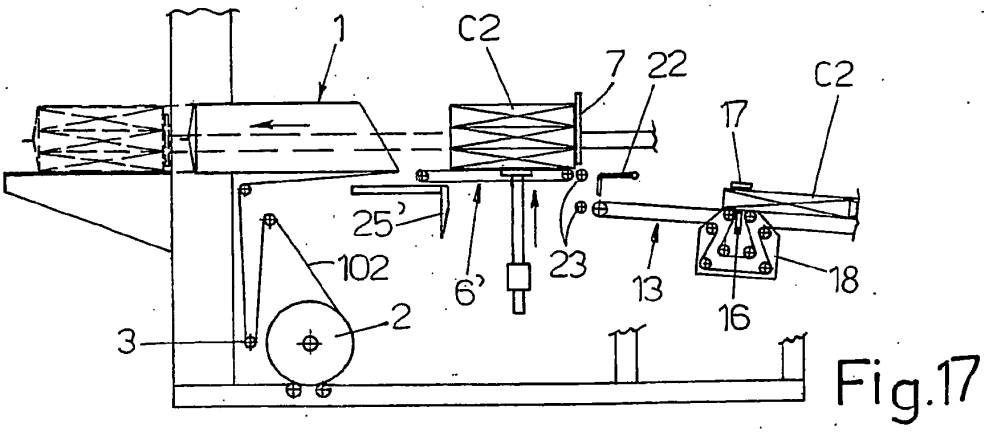


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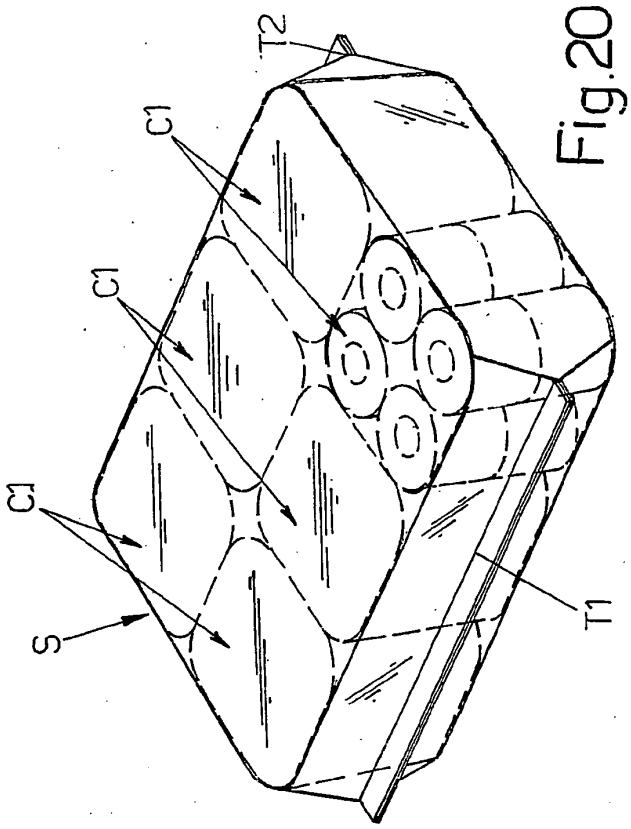


Fig.20

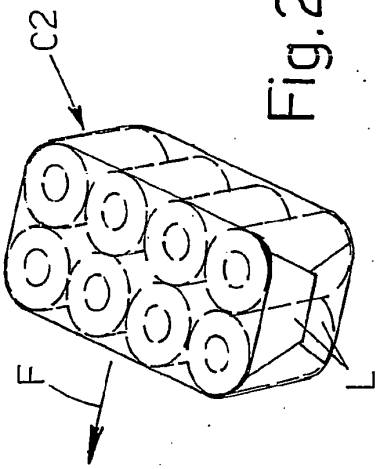


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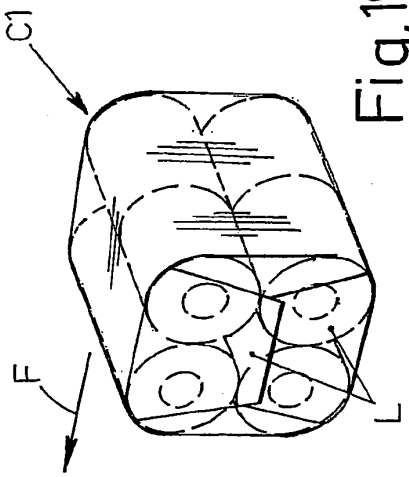


Fig.19

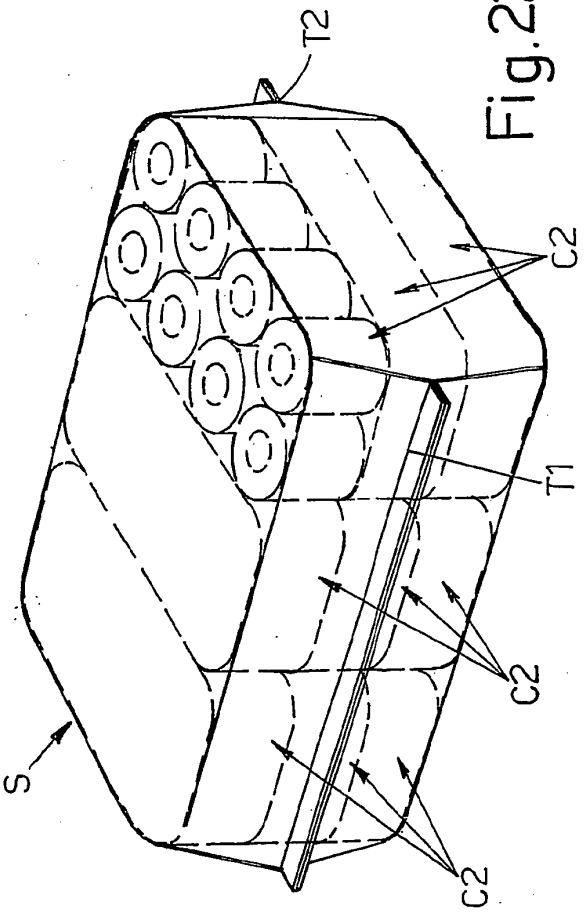


Fig.22

REFERENCES CITED IN THE DESCRIPTION

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- WO 0005138 A **[0006]**
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