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(54) **CAPPING MACHINE WITH DOUBLE TUBULAR FILM HANDLING SYSTEM**

(57) A stretch hooding machine 1 for packaging pallets 200, comprising a warehouse 2 configured to hold at least one first spool 21 of first tubular film 100 and at least one second spool 22 of second tubular film 101, a film positioning cart 4, arranged to grasp a portion of first or second tubular film 100, 101 at an end and to fit said portion of first or second tubular film 100, 101 on the pallet 200, a film preparation cart 3 comprising a supplying head 5 arranged to withdraw the portion of first or second tubular film 100, 101 from the warehouse 2, characterized in that said supplying head 5 comprises a mo-

torized roller 51, a first idle roller 52 and at least second idle roller 53 free to rotate about their axis and suitable to be put in rotation by the contact with the motorized roller 51, said first idle roller 52 being configured to withdraw and hold a portion of first tubular film 100 interposed between the first idle roller 52 and the motorized roller 51 and said at least second idle roller 53 configured to withdraw and hold a portion of second tubular film 101 interposed between the second idle roller 53 and the motorized roller 51.

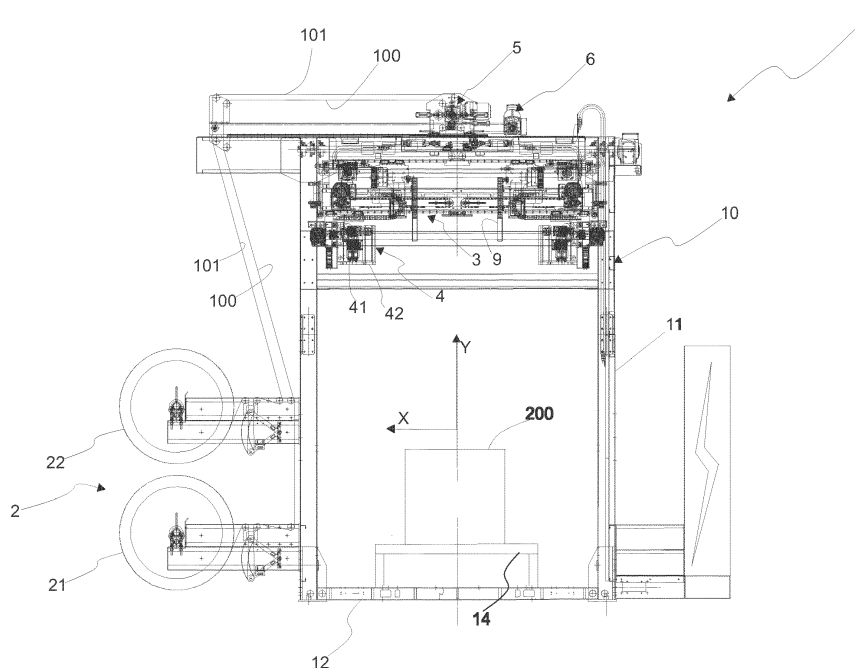


FIG. 1

Description

APPLICATION FIELD OF THE INVENTION

[0001] The present finding is in the field of machines for packaging pallets. In particular, it relates to a machine referred to as a stretch hooding machine, i.e., configured to cover a stack of articles arranged on pallets with a hood of a stretchable tubular film adapted to protect and stabilize said articles.

STATE OF THE ART

[0002] Stretch hooding machines for packaging pallets by a hood of stretchable tubular film are known from the state of the art.

[0003] Said film is fitted on products arranged on a pallet in order to stabilize the pallet, thus making it transportable, and in order to protect the products against external agents, especially during the transport and storage steps.

[0004] The products can be of various types, including food or beverage products, whether in bulk or packaged in packs or bundles, cement bags, bags of food products, bricks, or even household appliances, buckets, paint cans, etc.

[0005] The action of the machines is based on the use of an elastic stretchable tubular film shaped in spools where the film exhibits a planar surface on the two long side thereof, and a bellows-folded part on the short sides thereof.

[0006] The currently available machines for packaging pallets by a hood of stretchable tubular film comprise a frame, having a predominantly vertical extension, on which:

- a device to supply the film;
- a device to cut and weld the film;
- a suctioning device to open the film;
- a positioning device arranged to grasp the tubular film at an end and to fit it on the stack of articles are generally installed.

[0007] The film is withdrawn by unwinding from a warehouse that can be integrated in the frame or independent, and that generally comprises at least one stretchable film spool.

[0008] The film supplying device provides for withdrawing a length of stretchable tubular film from said warehouse.

[0009] The cutting and welding device is located below the supplying device, which cutting and welding device is arranged to cut and weld the film so as to obtain a hood that is closed at an end thereof; for some applications, the upper welding is not carried out, thus creating a tubular hood open at the two ends thereof.

[0010] The suctioning device, located below the cutting and welding device, is configured to open the lower flaps

of the stretchable tubular film so as to allow the insertion of the positioning device, which in turn grasps said lower flaps, spreading them apart beyond the size of the pallet, and it lowers the same hood, fitting it on the underlying stack of material to be protected.

[0011] The supplying device generally comprises a pair of rollers, at least one of which is motorized.

[0012] The rollers are arranged to hold therebetween a section of tubular film, which is in a flattened configuration in two overlapping layers. Thus, the rotation of the rollers causes a dragging of the film in the same direction as the rotation direction of the same rollers. Said length of film that is withdrawn by the rollers is obtained by unwinding from the film spool present in the warehouse.

[0013] Most of the stretch hooding machines provide for a single spool within the warehouse.

[0014] However, it is often necessary to use spools that are different both in thickness and in size in order to conform to the hooding needs of the pallets to be processed. For this reason, there are stretch hooding machines in which the warehouse is arranged to hold more than a spool, and more frequently two.

[0015] In this manner, whenever it is necessary to hood the pallets with different types of films, the machine can automatically perform the exchange from a spool to the other one, so that the film is unwound from the most suitable spool present in the warehouse.

[0016] In the case that it is not necessary to work with different spools, the possibility to have two spools in the warehouse makes the spool change operations that are carried out more rapid, to the advantage of the machine productivity.

[0017] In order to manage the film coming from two spools, the state of the art provides for a supplying device with two pairs of rollers, as described above, where each pair has at least one motorized roller.

[0018] Therefore, said solution requires two distinct motorizations to process the film coming from the two spools. The cost of the second motorization, including the control and management members, makes this solution not very cost-effective and applicable only when the use of two spools in the warehouse is in fact necessary, involving the implementation of a machine that is less flexible and has a lower frequency.

DISCLOSURE AND ADVANTAGES OF THE FINDING

[0019] An object of the present invention is to provide to the art an improved stretch hooding machine for packaging pallets, which is structurally and functionally devised for overcoming one or more of the drawbacks set forth above with reference to the mentioned prior art.

[0020] Within the scope of the above-mentioned problem, a main object of the invention is to finalize a stretch hooding machine that maintains the characteristics of flexibility and high production, allowing the use of more than one stretchable film spool, without adding further motorizations, with respect to those already present in

the machine.

[0021] It is also the object of the present invention to provide a solution that allows changing quickly and automatically the type of film to be used, without the need to create a dedicated supplying device for each type of film to be processed.

[0022] A further object of the invention is also to provide to the art a machine for packaging pallets within the scope of a solution that is flexible and of a quite moderate cost.

[0023] Such and other objects are achieved by virtue of the characteristics of the invention set forth in the independent claim 1. The dependent claims outline preferred and/or particularly advantageous aspects of the invention.

[0024] In particular, an embodiment of the present invention provides a machine for packaging pallets comprising a warehouse film, a film positioning cart arranged to grasp a portion of tubular film at an end and to fit it on the pallet, a film preparation cart arranged to withdraw, by a supplying head, the portion of tubular film from the warehouse and to carry out the cutting and welding thereof at a certain section; the warehouse film is configured to hold at least two spools of tubular film and the supplying head is configured to work with the film coming from the first or the second spool. Preferably, said head comprises a motorized roller, a first idle roller and at least second idle roller free to rotate about their axis and suitable to be put in rotation by the contact with the motorized roller. The first idle roller is configured to withdraw and hold a portion of the tubular film of the first spool being interposed between the first idle roller and the motorized roller and said at least second idle roller is configured to withdraw and hold a portion of second tubular film interposed between the second roller and the motorized roller.

[0025] By virtue of this solution, it is possible to use alternately different types of films coming from at least two different spools, where the preparation of the film to be used occurs by a single motorized roller, which puts the first or second idle roller in rotation by contact, so as to unwrap and prearrange the film coming from the first or the second spool.

[0026] According to an aspect of the finding, the supplying head comprises an approaching device configured to put the first and the at least one second idle roller in contact, by the motorized roller, passing from a contact position to a detached position from the same motorized roller. Said change of position preferably occurs in an alternated manner, i.e., when the motorized roller is in rotation and the first idle roller is in the contact position, the at least second idle roller is in the detached position, and vice versa.

[0027] By virtue of this solution, only one type of film for each machine cycle is unwound, and in particular the type of film that is the most suitable for the given pallet to be processed; said selection is carried out as a function of the recipe intended for the type of pallet to be processed, said recipe being defined in the program of a control unit that manages the stretch hooding machine.

[0028] A further advantage is given by the fact of providing a mechanical construction of the supplying head which is simple and well integrated in the film preparation cart; in fact, the approaching device is preferably configured to translate said first and at least second idle rollers according to an axis parallel to the ground and in a direction orthogonal to the rotational axis thereof.

[0029] Another aspect of the invention is to provide a solution where the supplying head further comprises holding means configured to block the first tubular film and the second tubular film in place.

[0030] In particular, the moving means are configured to alternately bring a pad in contact with a first or second abutting member so that said pad exerts a force against the abutting members, thus blocking the first and/or the second tubular films that are interposed.

[0031] In such a manner, before one of the idle rollers detaches from the motorized roller, said holding means block the film, which would otherwise be released, with the risk that it unwinds falling to the ground.

[0032] Vice versa, when one of the idle rollers contacts the motorized roller, said holding means release the corresponding film to allow the unwrapping thereof to the aim of its preparation and use.

[0033] In addition, among the achieved advantages, it is pointed out that the film to be used is perfectly centred with the cutting and welding members as well as with the grasping members of the film preparation cart.

[0034] By virtue of this aspect, it is possible to ensure the proper hooding of the pallet when the film comes both from the first and the second spool.

[0035] In fact, in a preferred embodiment, the film preparation cart further comprises film centering members to translate the supplying head between at least two positions so that said supplying head is in a first position where the first film is centered with the film preparation cart when said first film is used and in the second position where the second film is centered with the film preparation cart when said second film is used.

[0036] Another aspect of the invention is to make the passage from a film to the other one automatic and rapid, due to the presence of the control unit configured to drive at least the approaching device, the moving means, and the film centering members, for the use of the first or at least second tubular film, as a function of the type of pallet to be processed.

[0037] Said objects and advantages are all achieved by the machine for packaging pallets, which is the subject matter of the present finding, which is characterized in what is provided for in the claims set forth herein below.

BRIEF DESCRIPTION OF THE FIGURES

[0038] This and other characteristics will be more clearly understood by the following description of some embodiments that are illustrated by way of non-limiting example only in the attached drawings.

- Fig. 1: illustrates a side view of the machine for packaging pallets.
- Fig. 2: illustrates a top view of the machine for packaging pallets.
- Fig. 3: illustrates in detail the supplying head of the film preparation cart.
- Figs. 4a and 4b: illustrate the two possible operative configurations of the stretch hooding machine with the first or the second film.

DESCRIPTION OF THE FINDING

[0039] With particular reference to Fig. 1, a stretch hooding machine 1 for packaging a stack of articles (not shown in the figure) is shown and more simply referred to as pallet 200 herein below; said stretch hooding machine 1 provides for a frame 10 on which all the devices required for the machine operativity are installed.

[0040] The stretch hooding machine 1 is supplied by a warehouse 2 generally located in the proximity of the frame 10.

[0041] According to a characteristic of the present finding, the warehouse 2 is configured to hold at least two spools of tubular film, including preferably at least one first spool 21 of first tubular film 100 and a second spool 22 of second tubular film 101.

[0042] Said first and second tubular films 100 and 101 are wound in the first spool 21 and the second spool 22 in a flattened configuration, respectively.

[0043] In such a flattened configuration, the first and second tubular films 100 and 101 are substantially arranged in two layers overlapping and laterally joined by a length of film that is preferably bellows-folded.

[0044] The dimensions of the film perimeter vary as a function of the perimeter to be packaged, as well as the film thickness may generally range from 25 to 180 micrometres as a function of the characteristics of wrapping/stability that it is desired to achieve.

[0045] The function of the machine 1 is to generate a hood by the use of the elastic tubular film 100 or 101 and to fit it on the pallet 200, in order to ensure the stability thereof for the transport and protection against external agents.

[0046] The first and second tubular films 100 and 101 can be of the same type or of a type that is different, for example, in their thickness or dimensions. In fact, as the size of the perimeter of the pallet 200 change, it may be necessary to use tubular films having different dimensions, as well as according to the type of product stored on the pallet 200, it may be necessary to use films with a thickness that is more suitable to ensure the proper packaging thereof.

[0047] If the first and second tubular films 100 and 101 are of a different type, the stretch hooding machine 1 will automatically withdraw from the warehouse 2 the first tubular film 100 or the second tubular film 101 as a function of the recipe intended for the type of pallet 200 to be processed, said recipe being defined in the program of

a control unit that manages the stretch hooding machine 1.

[0048] If the first and second tubular films 100 and 101 are of the same type, the presence of a first and a second spools 21 and 22 in the warehouse 2 will ensure a higher efficiency of the machine 1, thus optimizing the times for changing the spool.

[0049] According to an aspect of the finding, the stretch hooding machine 1 comprises two carts, i.e., a film preparation cart 3 and a film positioning cart 4.

[0050] Said film preparation 3 and film positioning 4 carts are installed on the frame 10, which preferably comprises at least two posts 11.

[0051] In a preferred embodiment shown in Fig. 1, the frame 10 comprises four posts 11 extending vertically according to a vertical direction that is orthogonal to the ground.

[0052] The four posts 11 are connected to the ground by a pedestal 12 on which a conveyor 14 rests, which is configured to receive and transfer a pallet 200 according to a forward direction Z.

[0053] In particular, the film positioning cart 4 is arranged to grasp the length of first tubular film 100, or the second tubular film 101 at an end and to fit said length of film 100 or 101 on the pallet 200; on the other hand, the film preparation cart 3 is arranged to withdraw a portion of first tubular film 100, or second tubular film 101 from the warehouse 2, to carry out the cutting and welding thereof at a certain section of said tubular film 100 or 101, besides being arranged to open the lower flaps thereof.

[0054] In the standard duty cycle of the stretch hooding machine 1, the film positioning cart 4 translates vertically, while the film preparation cart 3 remains in a stationary position, preferably at the top of the frame 10.

[0055] The film preparation cart 3 comprises a supplying head 5, welding and cutting members 8, and suctioning devices 9.

[0056] Preferably, below the supplying head 5, the welding and cutting members 8 are arranged to cut the portion of tubular film 100 or 101 above the welding, thus separating it from the rest of the spool 21 or 22.

[0057] According to an aspect of the invention, the film preparation cart 3 provides for, below the welding and cutting members 8, the suctioning devices 9.

[0058] Such suctioning devices 9 are arranged opposite in order to be able to contact the two sides of the tubular film 100 or 101 and they are configured to grasp the lower flaps of said tubular film 100 or 101.

[0059] Said suctioning devices 9 perform a first approaching to the tubular film 100 or 101, followed by a moving away; said moving away is aimed to open the lower flaps of the tubular film 100 or 101.

[0060] Preferably, the film positioning cart 4 is located below the film preparation cart 3.

[0061] In an embodiment, said film positioning cart 4 comprises grasping pliers 41, preferably four pliers, and film collecting members 42.

[0062] According to an embodiment the film position-

ing cart 4 provides for lifting in a vertical direction approaching to the film preparation cart 3, so that said pliers 41 can enter the lower flaps of the tubular film 100 or 101, kept open by the suctioning devices 9.

[0063] The film collecting members 42 contact the tubular film 100 or 101 to retrieve all the hood withdrawn from the supplying head 5 and already cut and welded in the film preparation cart 3.

[0064] Then an extension step begins, in which the pliers 41 spread apart, moving on a horizontal plane parallel to the ground, so as to extend the hood to be able to fit it on the underlying products.

[0065] The extension step continues until obtaining a film having a size larger than the perimeter of the pallet 200 to be processed. Thereafter, the descent of the film positioning cart 4 begins, during which the film collecting members 42 release the hood on the pallet 200.

[0066] At the end of its vertical stroke, the hood is completely released by the pliers 41 and fitted on the stack of articles.

[0067] The lower cart 4 rises vertically to be able to allow the exit of the hooded pallet 200 and to carry out a subsequent working cycle.

[0068] In a formulation of the present finding, the supplying head 5 provides for withdrawing a length of first tubular film 100, or second tubular film 101 by unwinding from the warehouse 2 as best detailed herein below.

[0069] As shown in Fig. 3, a preferred embodiment provides that said supplying head 5 comprises a motorized roller 51 and at least a pair of idle rollers 52 and 53.

[0070] In particular, a first idle roller 52 and a second idle roller 53 that are free to rotate about their axis and suitable to be put in rotation by the contact with the motorized roller 51 are defined.

[0071] Said first and second idle rollers 52 and 53 are configured to withdraw and hold a portion of first and second tubular films 100 and 101; in fact, the tubular film 100 of the first spool 21 is interposed between the first idle roller 52 and the motorized roller 51, while the tubular film 101 of the second spool 22 is interposed between the second idle roller 53 and the motorized roller 51.

[0072] Further embodiments can provide also more than two idle rollers, such as, for example, three, provided that there is enough space to make them contact the motorized roller 51; in such a case, the warehouse 2 will hold three spools the films of which will be interposed between the corresponding idle rollers and the motorized roller 51.

[0073] In accordance with an aspect of the invention, the supplying head 5 comprises an approaching device 54 configured to bring said first and second idle rollers 52, 53 in contact with the motorized roller 51 passing from a contact position C to a detached position D from the motorized roller 51.

[0074] According to an aspect of the invention, when the motorized roller 51 is in rotation, the two idle rollers 52 and 53 are never simultaneously in contact with the motorized roller 51 to avoid the concomitant unwrapping

of the first and second tubular films 100 and 101; in the case that on the supplying head 5 more than two idle rollers are installed, during an operative step, just one idle roller will always be the only contact with the motorized roller 51.

[0075] Therefore, in an operative step, when the first idle roller 52 is in a contact position C with the motorized roller 51, the second idle roller 53 is in the detached position D from the motorized roller 51, and vice versa.

[0076] For example, in the case that the first idle roller 52 is in a contact position C with the motorized roller 51, the first film 100 is held between said rollers; by virtue of this solution, when the motorized roller 51 is put in rotation, it transmits by friction said rotation to the first idle roller 52; in such a manner, the first tubular film 100, which is interposed, is towed, withdrawing it from the first spool 21, and it is collected below said rollers.

[0077] The same occurs on the second tubular film 101, when the second idle roller 53 is in a contact position C with the motorized roller 51.

[0078] In a preferred embodiment, the motorized roller 51 and/or the pair of idle rollers 52 and 53 are preferably rubberized.

[0079] The friction exerted by the rubber on the tubular film 100 or 101, allows the rollers performing the towing function of the tubular film 100 or 101 in the same direction as the direction of rotation of the rollers themselves; in such a manner, the amount of film 100 or 101 that is necessary to package the stack of articles is unwound.

[0080] The passage of the first and second idle rollers 52 and 53 from the contact position C to the detached position D occurs automatically by the drive of the control unit, which manages the stretch hooding machine 1, and as a function of the set recipe for the type of pallet 200 to be processed.

[0081] According to a preferred embodiment, the approaching device 54 comprises at least one pneumatic cylinder mechanically associated to the first idle roller 52 and the second idle roller 53.

[0082] In particular, an embodiment providing for a pair of pneumatic cylinders for each idle roller 52 and 53 is shown in Fig. 3. However, in the present finding alternative embodiments are also included, such as, for example, a single pair of cylinders mechanically associated to both the idle rollers 52, 53 so that they are moved together, i.e., while a roller abuts, the other one detaches from the motorized roller 51.

[0083] Anyhow, it is intended that what has been described above has an exemplary, non-limiting value; therefore, possible detail variations that are required due to technical and/or functional reasons, such as, for example, an approaching device 54 comprising hydraulic or electrical actuators, are to be intended as included in the present finding.

[0084] A further possible embodiment provides that the approaching means 54 are configured to move the motorized roller 51, putting it in contact alternately with the first idle roller 52 or the second idle roller 53.

[0085] In una formulation of the present finding, the approaching device 54 is configured to translate said first and second idle rollers 52, 53 according to an axis X parallel to the ground, which is directed orthogonal to the rotational axis of said rollers.

[0086] By virtue of this solution the mechanical construction of the supplying head 5 is simplified.

[0087] According to a further aspect of the invention, the supplying head 5 further comprises holding means 7 configured to block the first tubular film 100 in place when the first roller 52 is in the detached position D from the motorized roller 51, and vice versa, to block the second tubular film 101 in place when the second roller 53 is in the detached position D from the motorized roller 51.

[0088] In fact, when the idle rollers 52 and 53 detach from the motorized roller 51, the tubular film 100 or 101, which is not held anymore, would tend to unwind towards the spool, thereby causing the film to fall to the ground.

[0089] In order to obviate this drawback, which would prevent the alternated use of the two or more tubular films 100 and 101, said holding means 7 are used. In particular, in the passage from the use of the first tubular film 100 to the second tubular film 101, and vice versa, the holding means 7 block the film that has not to be used, before the corresponding idle roller 52 or 53 detaches from the motorized roller 51; furthermore, said holding means 7 release the film to be used only after the corresponding idle roller 52 or 53 has contacted the motorized roller 51.

[0090] According to an aspect of the invention, the holding means 7 comprise abutting members 72 and 73, at least one pad 71 related moving means 74, where between the abutting member 72 and the pad 71 the first tubular film 100 interposes, and where between the abutting member 73 and the pad 71 the second tubular film 101 interposes; said pad 71 is configured to exert a force against the abutting members 72 and 73, blocking the first or second tubular film 100, 101 in place.

[0091] As shown in Fig. 3, in order to simplify the mechanical construction without interfering with the tubular films 100 and 101, the holding means 7 are advantageously arranged below the first and second idle rollers 52 and 53.

[0092] According to an aspect of the finding, the abutting members 72 and 73 are shaped as a roller, and the pad 71 is a dish that is preferably rubberized on the two sides that abut against the abutting members 71 and 72. The moving means 74 can be formed by a pneumatic cylinder mechanically associated to the pad 71.

[0093] The moving means 74 are configured to move said pad 71 between a first position, in which it pushes and blocks the film 100 against the corresponding abutting member 72, while at the same time it detaches from the abutting member 73, thus releasing the film 101, and a second position, in which it pushes and blocks the film 101 against the corresponding abutting member 73 by detaching from the abutting member 72 to release the film 100.

[0094] In Fig. 3 the abutting members 72 are preferably rollers, but any type of abutting surface is meant to be encompassed in the protection scope of the present finding; instead, the pad 71 is represented as a rubberized dish configured to be positioned by a pneumatic cylinder. Neither this solution has to be meant as limiting, but only as a possible embodiment.

[0095] Also a further solution is to be meant as a part of the finding, which provides for keeping the pad 71 stationary and to move the abutting members 72 and 73 to block the films 100 and 101.

[0096] In order to be able to work in an optimal way, it is necessary that the tubular film 100 or 101, in use, is located substantially at the centre of the cart 3, i.e., as much centered with the welding and cutting members 8 and with the suctioning devices 9 as possible, on an axis that will be referred to as the central operative axis Y; in such a manner, it is possible to ensure the proper insertion of the tubular film 100 or 101 on the pallet 200.

[0097] Therefore, a preferred embodiment provides that the film preparation cart 3 further comprises film centering members 6 configured to translate the supplying head 5 according to the direction X, between at least one first position A and a second position B.

[0098] The first position A makes so that the point of contact between the motorized roller 51 and the first idle roller 52 is located substantially at the central operative axis Y, so that the first stretchable film 100 is substantially centered with the film preparation cart 3.

[0099] The second position B makes so that the point of contact between the motorized roller 51 and the second idle roller 53 is located substantially at the central operative axis Y, so that the second stretchable film 101 is substantially centered with the film preparation cart 3.

[0100] In accordance with the invention, said film centering members 6 comprise actuating members 63 and sliding members 62 to translate the supplying head 5 on the film preparation cart 3.

[0101] In particular, the actuating members 63 preferably comprise at least one gearmotor 67 and at least one transmitting member 68 to translate the supplying head 5.

[0102] This solution is preferable where a system for the translation of the supplying head 5 is already provided for, for example, used to facilitate maintenance operations. In such a case, said translation system will also act as film centering members 6.

[0103] Alternatively, a further possible solution instead provides for actuating members 63 of the pneumatic type, comprising at least one pneumatic cylinder 66 or possibly also actuation members of the hydraulic type.

[0104] Said film centering members 6 are preferably located on the film preparation cart 3 above the welding 8 and cutting 9 members, as shown in Fig. 3.

[0105] In Figs. 4a and 4b two possible working configurations of the stretch hooding machine 1 are shown, which are arranged to an operation with two spools 21 and 22, where in Fig. 4a the machine is configured to use the first film 100 of the first spool 21, while in Fig. 4b

it is configured to use the second film 101 of the second spool 22.

[0106] The passage from the configuration shown in Fig. 4a to that of Fig. 4b is best described herein below.

[0107] When, during the working cycle of the stretch hooding machine 1 that is the subject matter of the present finding, it is necessary to change the film which is being used, for example passing from the first tubular film 100 to the second tubular film 101, as a function of the recipe intended for the type of pallet 200 to be processed, the control unit automatically performs the change of format.

[0108] Said control unit controls several devices, among which the approaching device 54, the moving means 74, and the film centering members 6.

[0109] In order to pass from the use of the first tubular film 100 to the second tubular film 101, the above-mentioned devices are preferably controlled according to the following operative sequence:

- The control unit sends a command signal to the approaching device 54 to bring the second idle roller 53 in a contact position C with the motorized roller 51;
- The control unit sends a command signal to the moving means 74 to bring the abutting members 72 in contact with the pad 71 by blocking the first tubular film 100; at the same time, the film 101 is released by detaching the abutting members 73 from the pad 71;
- The control unit sends a command signal to the approaching device 54 to bring the first idle roller 52 in a detached position D from the motorized roller 51;
- The control unit sends a command signal to the film centering members 6 to bring the supplying head 5 to the position B so that the second stretchable film 101 is substantially centered with the film preparation cart 3.
- Preferably, the steps are carried out in the order as described above.

[0110] In order to pass from the use of the second tubular film 101 to the first tubular film 100, the sequence will be the same, but with the devices inverted.

[0111] Anyhow, it is intended that what has been described above has an exemplary, non-limiting value; therefore, possible detail variations that are required due to technical and/or functional reasons are as of now encompassed in the same protection scope defined by the claims set forth herein below.

Claims

1. A stretch hooding machine (1) for packaging pallets (200), comprising a warehouse (2) configured to hold at least one first spool (21) of first tubular film (100) and at least one second spool (22) of second tubular film (101), a film positioning cart (4), arranged to

grasp a portion of first or second tubular film (100, 101) at an end and to fit said portion of first or second tubular film (100, 101) on the pallet (200), a film preparation cart (3) comprising a supplying head (5) arranged to withdraw the portion of first or second tubular film (100, 101) from the warehouse (2) and to carry out the cutting and welding thereof at a certain section of said first or second tubular film (100, 101), **characterized in that** said supplying head (5) comprises a motorized roller (51), a first idle roller (52) and at least second idle roller (53) that are free to rotate about their axis and suitable to be put in rotation by the contact with the motorized roller (51), said first idle roller (52) being configured to withdraw and hold a portion of first tubular film (100) interposed between the first idle roller (52) and the motorized roller (51) and said at least second idle roller (53) configured to withdraw and hold a portion of second tubular film (101) interposed between the second idle roller (53) and the motorized roller (51).

2. The stretch hooding machine (1) according to claim 1, wherein the supplying head (5) comprises an approaching device (54) configured to put said first and said at least second idle roller (52, 53) in contact with the motorized roller (51) passing from a contact position (C) to a detached position (D) with respect to the motorized roller (51).

3. The stretch hooding machine (1) according to claim 2, wherein when the motorized roller (51) is in rotation and the first idle roller (52) is in the contact position (C), the at least second idle roller (53) is in the detached position (D), and vice versa.

4. The stretch hooding machine (1) according to one of the claims 2 or 3, wherein the approaching device (54) is configured to translate said first and at least second idle roller (52, 53) according to an axis (X) that is parallel to the ground and in a direction orthogonal to their rotational axis.

5. The stretch hooding machine (1) according to one of the preceding claims, wherein the supplying head (5) further comprises holding means (7) configured to block the first tubular film (100) and the second tubular film (101) in place, where said holding means (7) comprise abutting members (72, 73) and at least one pad (71) arranged so that the first tubular film (100) is interposed between the abutting member (72) and the pad (71), and the second tubular film (101) is interposed between the abutting member (73) and the pad (71).

6. The stretch hooding machine (1) according to claim 5, wherein the holding means (7) further comprise moving means (74) configured to bring the pad (71) in contact with the abutting member (72) and with

the abutting member (73), so that said pad (71) exerts a force against the abutting members (72, 73), blocking the first and/or the second tubular films (100, 101) in place.

7. The stretch hooding machine (1) according to one of the preceding claims, wherein the film preparation cart (3) further comprises film centering members (6) to translate the supplying head (5) according to the axis (X), between a first position (A) and a second position (B), where said supplying head (5) is in the first position (A) when the point of contact between the motorized roller (51) and the first idle roller (52) is located substantially at a central operative axis (Y) of the film preparation cart (3), while it is in the second position (B) when the point of contact between the motorized roller (51) and the at least second idle roller (53) is located substantially at said central operative axis (Y).
8. The stretch hooding machine (1) according to claim 7, wherein the film centering members (6) comprise actuating members (63) and sliding members (62) to translate the supplying head (5) on the film preparation cart (3).
9. The stretch hooding machine (1) according to one of the preceding claims, wherein the moving means (6) are located above welding and cutting members (8), which are suitable to cut and weld a certain section of first or at least second tubular film (100, 101) withdrawn from the supplying head (5).
10. The stretch hooding machine (1) according to one of the preceding claims, when dependent at least from the claims 2, 6 and 7, which further comprises a control unit configured to drive at least the approaching device (54), the moving means (74) and the film centering members (6), for the use of the first or at least second tubular film (100, 101), as a function of the type of pallet (200) to be processed.
11. The stretch hooding machine (1) according to claim 10, wherein the control unit that, in order to pass from the use of the first tubular film (100) to the second tubular film (101), is programmed to:
 - send a command signal to the approaching device (54) to bring the second idle roller (53) in a contact position (C) with the motorized roller (51);
 - send a command signal to the moving means (74) to bring the abutting members (72) in contact with the pad (71) blocking the first tubular film (100); at the same time the film (101) is released by detaching the abutting members (73) from the pad (71);
 - send a command signal to the approaching

device (54) to bring the first idle roller (52) in a detached position (D) from the motorized roller (51);

- send a command signal to the film centering members (6) to bring the supplying head (5) in the position (B) so that the second stretchable film (101) is substantially at the central operative axis (Y) of the film preparation cart (3).

12. A method to carry out a passage from the first tubular film to the second tubular film in a stretch hooding machine (1) according to one of the preceding claims, said stretch hooding machine (1) further comprising a control unit configured to send command signals at least to the approaching device (54), the moving means (74), and the film centering members (6), which method provides for:

- sending a command signal to the approaching device (54) to bring the second idle roller (53) in a contact position (C) with the motorized roller (51);

- sending a command signal to the moving means (74) to bring the abutting members (72) in contact with the pad (71) blocking the first tubular film (100); at the same time the film (101) is released detaching the abutting members (73) from the pad (71);

- sending a command signal to the approaching device (54) to bring the first idle roller (52) in a detached position (D) from the motorized roller (51);

- sending a command signal to the film centering members (6) to bring the supplying head (5) in the position (B) so that the second stretchable film (101) is substantially at the central operative axis (Y) of the film preparation cart (3).

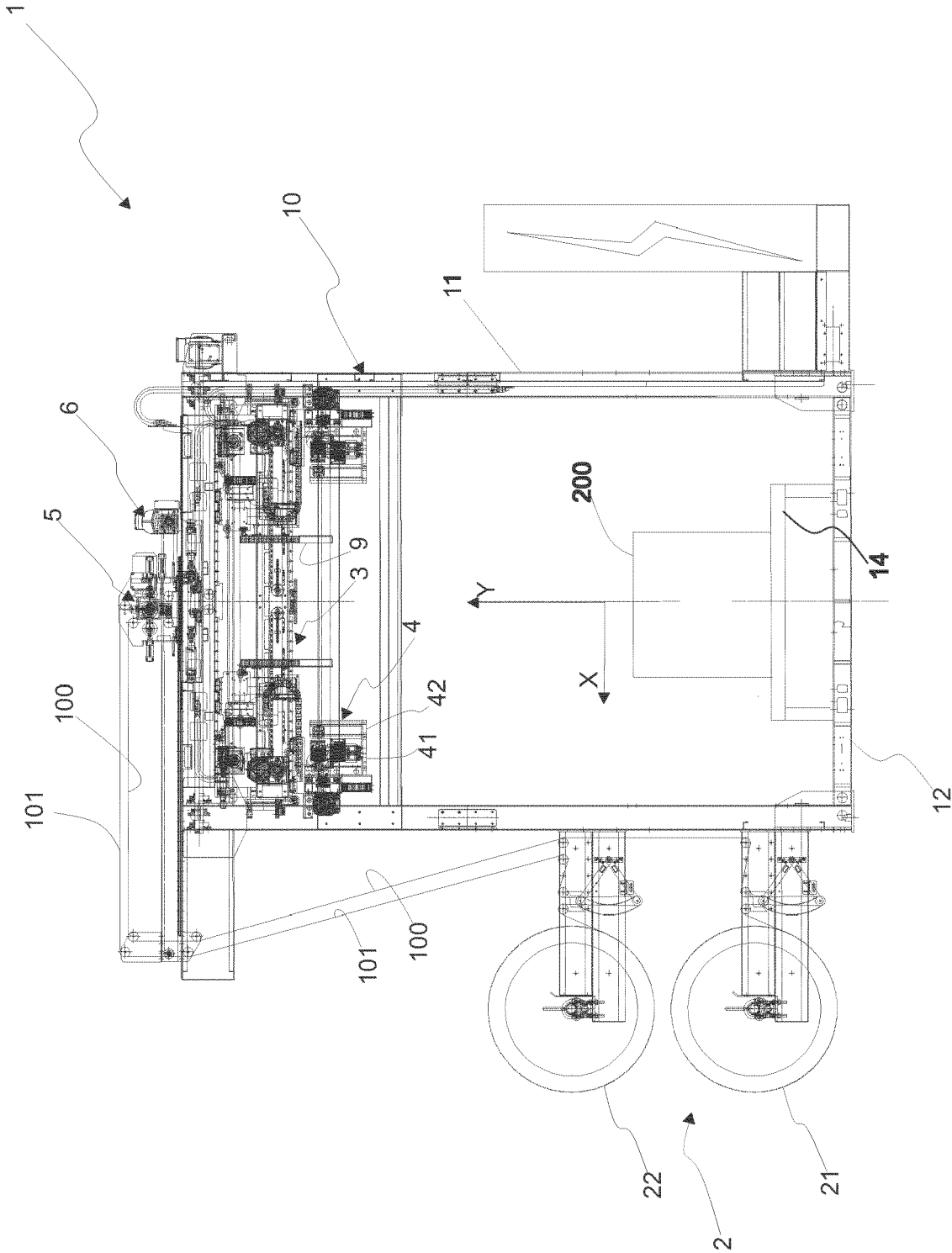


FIG. 1

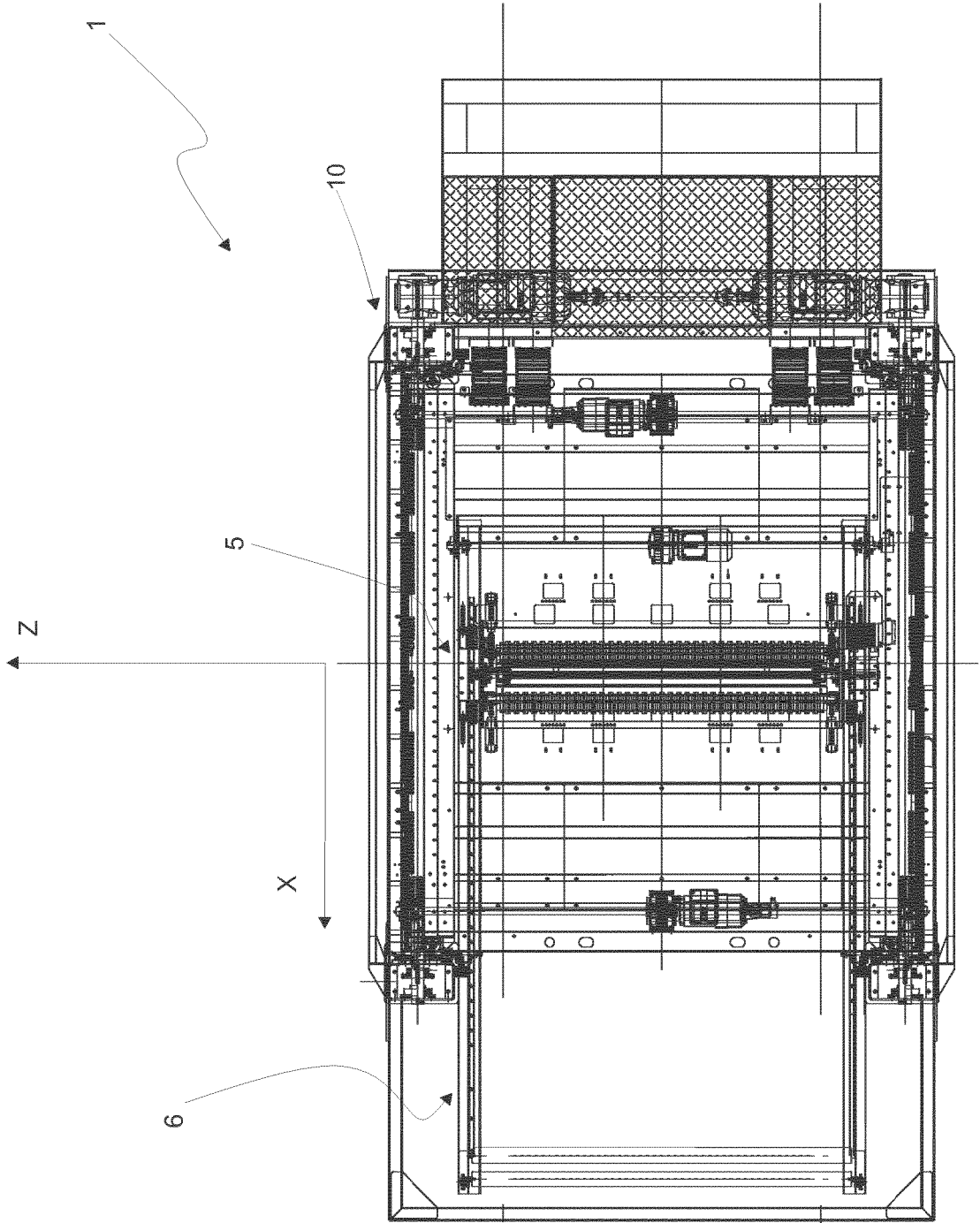


FIG. 2

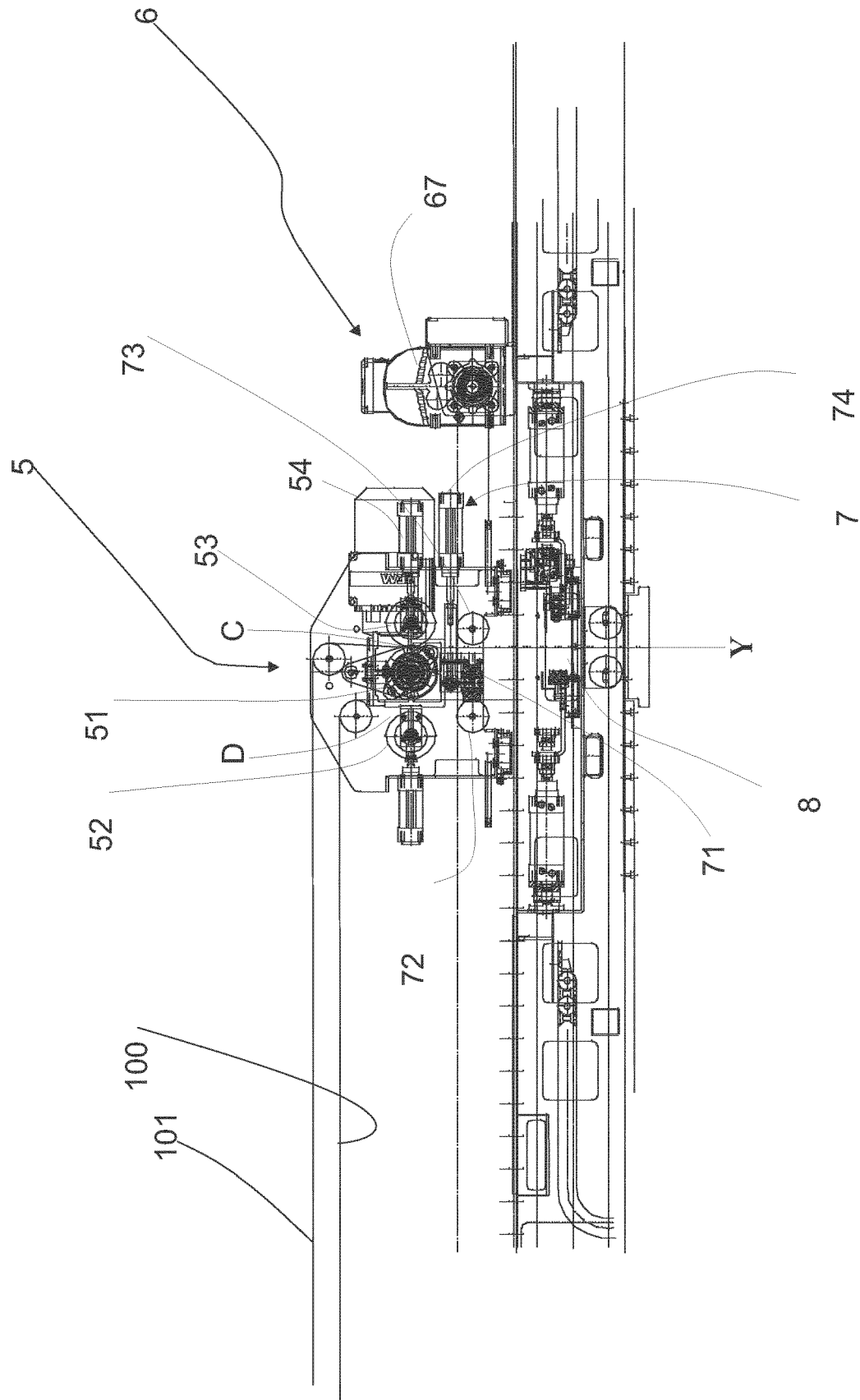
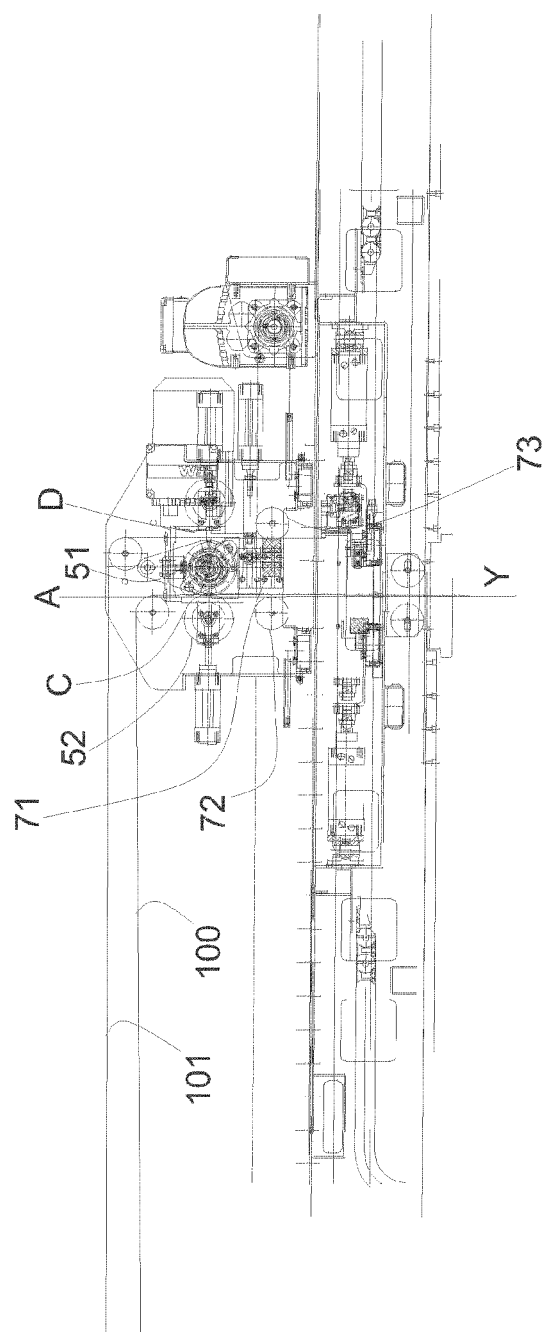
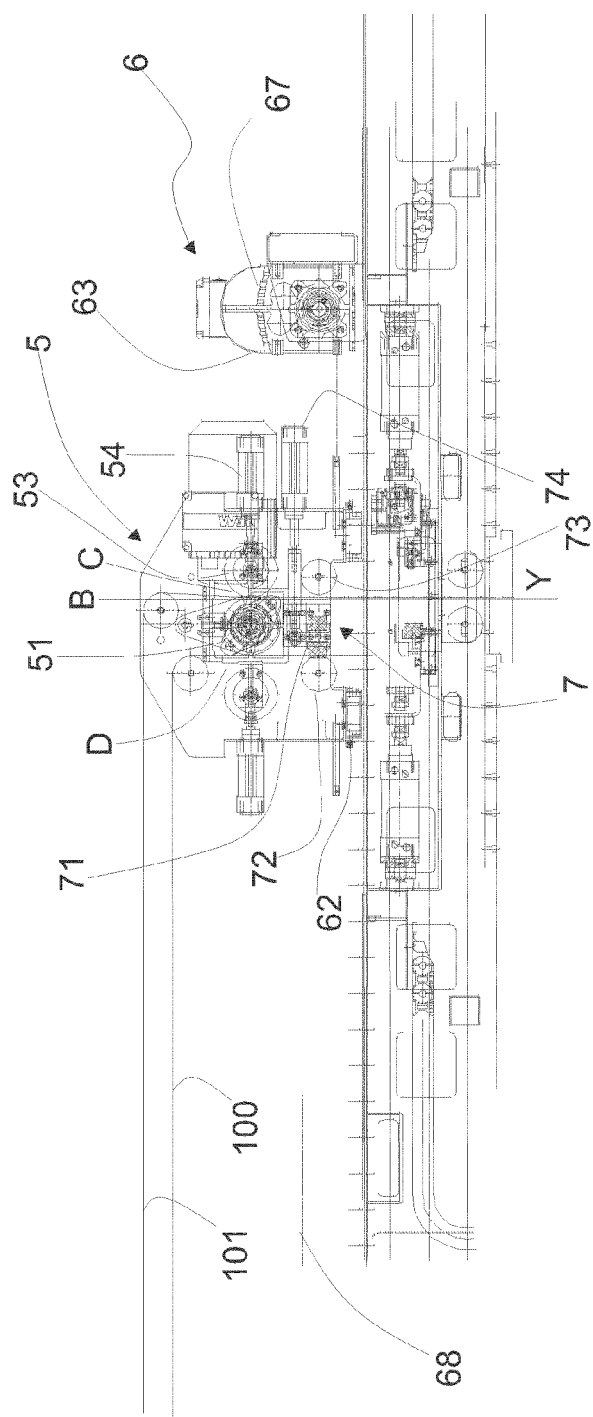


FIG. 3





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Application Number
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