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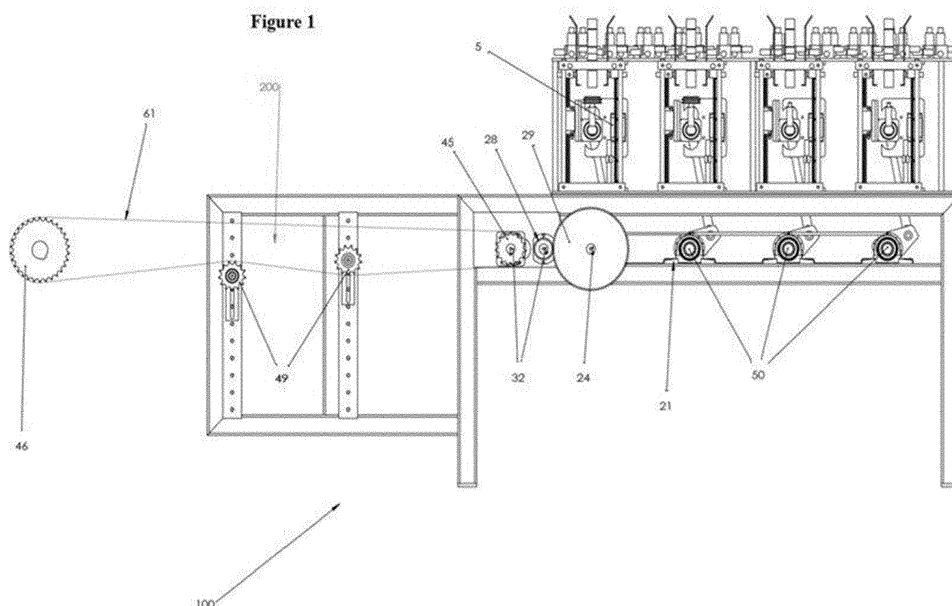
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(54) **DEVICE FOR AUTOMATIC PLACEMENT OF WOODEN LATHS ON THE PRODUCTION LINE**

(57) The essence of the present invention is based on the vacuum gripping of wooden laths, wherein the thickness, dimensions and surface flatness of the wooden laths are not critical to the operation of the device. Via the sprocket and gears, the device can be connected to an already existing wood packaging machine from which it is also drive supplied. When the piston rods (43) raise the gripper shafts (12) to the upper position and the vacuum grippers (54) grip the last lath from the container, the piston rods (43) then lower the gripper shaft (12) with the vacuum grippers (54) and the wooden lath. Via the

gear (13) and the toothed bar (15), the gripper shafts (12) with the vacuum grips (54) and the wooden lath rotate by 180 degrees and move to the lower position. The springs (52) also amortize sudden impacts and ensure slow lowering of the laths. When the piston rod (43) releases the shaft (12) with the vacuum grippers (54) and the lath, in the fully down position the inductive sensor is activated, giving the signal to the electromagnetic valves (53) to shut off the vacuum and to blow the pressurized air through the same hose.

Figure 1



Description

FIELD OF THE INVENTION

[0001] The present invention belongs to the field of mechanical engineering and electronics. It is intended for use in the wood industry, more precisely in the production of elements for wooden packaging.

TECHNICAL PROBLEM

[0002] In the process of making wooden packaging, a wooden lath should be precisely placed on the production line strip for the production of wooden packaging.

[0003] Existing devices for automatic placement of wooden laths on the production line are provided only for laths whose thickness is greater than 2.4 mm. If thinner laths would be used in the existing devices, especially those of 1.00 or 1.5 mm, because of their small weight, it would not be possible to place such laths on the production line, since they are too light and do not fit well into the slot on the production line.

[0004] The inventor has found a solution how to enable an automatic placement of wooden laths thinner than 2.4 mm on the production line. Therefore, it would be ensured that the laths are precisely placed in the foreseen position on the production line for the production of wooden packaging.

[0005] Another problem solved by the inventor is to reduce the number of workers on the machine for automatic placement of wooden laths on the production line, since this is a precise procedure, so fewer workers are required. Additionally, productivity has been increased, and the work of existing workers has been considerably facilitated, and this is now all made possible in the smaller space required for the device described in the present application.

PRIOR ART

[0006] The use of similar devices for automatic placement of wooden laths on the production line is already known. One solution is offered by the company "Sodeme" from France and another by the company "Coral" from Italy. The solution to the problem offered by "Sodeme" is based on the ejection of the wooden laths by using the small metal saws, whereby the lath falls freely into the existing mould on the production line. The solution to the problem offered by the company "Coral" is based on the ejection of the laths, where, first, it is ejected one side, and then the other side of the lath from the container by using the small air pistons. The disadvantage of the above described solutions is that they are only intended for the laths with a thickness above 2.4 mm, and the customer's current requirement is the thickness of the laths of 1.5 - 1.7 mm. The above mentioned solutions require exceptionally precise measurements of the laths as well as their ideally flat surfaces, which is very difficult

to achieve in the production of wooden packaging elements.

BRIEF SUMMARY OF THE INVENTION:

[0007] The essence of the present invention is based on the vacuum gripping of wooden laths, wherein the thickness, dimensions and surface flatness of the wooden laths are not critical to the operation of the device. After pulling out the wooden lath from the container, the device precisely and easily lowers the lath down on the conveyer belt in the intended spot (mould). The possibility of error is minimal. The advantage of this invention is the reduction in the number of workers by 50% (two workers less), the increase in production from 5% to 20% and the reduction of the space required for the operation of the machine.

[0008] The device for automatic placement of wooden laths on the production line usually comprises a device base and a device drive. The invention presented here essentially comprises at least one transmission assembly and at least one set of vacuum grippers, wherein, when the device for automatic placement of wooden laths is in operation, the transmission assembly controls the movement of the set of vacuum grippers, which grip the wooden lath, so that the transmission assembly moves the set of vacuum grippers together with the wooden lath and positions the wooden lath on the production line. At that moment, the set of vacuum grippers releases the wooden lath, and the whole process continuously repeats itself as the production line moves. The set of vacuum grippers comprises a gripper shaft, at least one vacuum gripper which is mounted on the gripper shaft, an air hose line and one or more valves, in such a way that the number of the vacuum grippers is equal to the number of the valves and wherein each of the vacuum grippers is connected to one valve via an air hose, so that the valve - when the vacuum gripper is in the position to grip the wooden lath - opens and allows the air suction from the space formed by the vacuum gripper and the wooden lath, so that the vacuum gripper firmly grips the lath. At the moment when the vacuum gripper needs to release the lath on the production line, the valve opens and, through the air hose line, the air is blown into the space formed by a vacuum gripper and a wooden lath, so that the vacuum gripper releases the wooden lath on the production line. Usually, the electromagnetic valves are used, especially when control is carried out through the electric power. Further, this device for automatic placement of wooden laths on the production line may also comprise a vacuum pump and an air turbine, which are connected to one or more electromagnetic valves by means of air hose line.

[0009] The vacuum grippers assembly may comprise 4 vacuum gripper brackets, each fitted with one rubber vacuum gripper. Furthermore, the set of vacuum grippers may also comprise 4 electromagnetic valves which are connected to the vacuum pump by means of a flexible

rubber hose which branches into four outputs, wherein each output is connected to one electromagnetic valve, while the air turbine is connected via the flexible rubber air hose which branches at the end into four outputs and where each output is connected to one electromagnetic valve. For more demanding processes, especially when the laths are longer or significantly wider, the set of vacuum grippers may comprise 6 vacuum gripper brackets, each fitted with one rubber vacuum gripper, and it further comprises 6 electromagnetic valves which are connected to the vacuum pump by means of a flexible rubber hose which branches into six outputs, wherein each output is connected to one electromagnetic valve, while the air turbine is connected via the flexible rubber air hose which branches into 6 outputs and where each output is connected to one electromagnetic valve.

[0010] The transmission assembly may comprise a shaft of transmission assembly drive which is driven by a specific drive that may be a drive of the whole production line for the production of packaging, but it can also be an independent drive. Furthermore, it comprises an eccentric lever and a piston rod which are connected to a hinge joint with one end of the piston rod, while at the other end, the piston rod is mounted on the gripper shaft, and wherein the piston rod, when the device is in operation, turns the circular motion of the transmission assembly shaft into the linear motion of the gripper shaft. In addition, it may also comprise a bottom plate and a top plate, wherein the transmission assembly further comprises a distance plate, a linear guide and a linear bearing, while the set of vacuum grippers also comprises a housing with bearings, wherein the gripper shaft passes through the housing, in such a way that the gripper shaft in the device's drive rotates inside the housing with bearings, wherein the linear guide is wedged between the bottom plate and the top plate, wherein the housing with bearings is fixed to a distance plate which is placed on the linear bearing that slides along the linear guide.

[0011] The transmission assembly may further comprise a gear and a toothed bar, wherein the gear is meshed with the toothed bar and mounted on the gripper shaft, and wherein the gripper shaft rotates by 180° when the device is in operation, which is caused by the passing gear over the toothed bar. The transmission assembly may also comprise a toothed bar plate and a linear bearing of the toothed bar which is wedged between the bottom plate and the top plate, wherein the toothed bar is screwed on the toothed bar plate, and wherein when the drive is in operation, the toothed bar plate slides along the linear bearing of the toothed bar so that it follows the vertical rectilinear movement of the gripper shaft and the gear.

[0012] The transmission assembly may further comprise a distance ring fixed to the toothed bar plate, a distance ring guide and two springs which are placed on the upper and the lower side of the said distance ring guide, while between these springs, a distance ring is placed, which distance ring presses one of the two springs every

time, depending on whether the distance ring moves downwards or upwards, wherein the distance ring guide is wedged between the bottom plate and the top plate, so that when the device is in operation, the springs precisely stop the toothed bar plate and thereby ensure precise rotation of the gripper shaft. The springs also amortize sudden impacts and ensure slow lowering of the laths.

[0013] The drive may comprise a sprocket wheel which can be driven by an existing machine for the production of wooden elements or by any other external drive. Besides, it also comprises a drive chain, a sprocket, a sprocket shaft and a gear of the sprocket of the device, wherein the sprocket wheel drives the drive chain which transmits movement to the sprocket, which is mounted on the sprocket shaft of the device, on which the gear of the sprocket wheel of the device is also rigidly mounted. Furthermore, the drive may comprise a transmission shaft to which the transmission gears and the intermediate drive gear are rigidly mounted. Furthermore, the drive may comprise a gear of the transmission shaft which is mounted on the drive shaft of transmission assembly in such a way that it can rotate around that gear, wherein the gear of the sprocket of the device transmits movement to the drive transmission gears, which - when device is in operation - causes the transmission shaft to rotate together with the intermediate drive gear, which transmits movement to the gear of the transmission shaft, wherein the said gear rotates the drive shaft of the transmission assembly. The drive may comprise a drive chain tensioning system.

[0014] In one embodiment of the present invention, it is possible that the device for automatic placement of wooden laths comprises four transmission assemblies and four sets of vacuum grippers so that each transmission assembly is connected to one set of vacuum grippers.

[0015] In another embodiment, the device for automatic placement of wooden laths on the production line may comprise four transmission assemblies and four sets of vacuum grippers so that each transmission assembly is connected to one set of vacuum grippers, wherein the drive further comprises four intermediate drive sprockets of the transmission assembly and intermediate drive chain, wherein on each of the four transmission assembly shafts there is one intermediate drive sprocket of transmission assembly, wherein the sprockets are driven by intermediate drive intermediate chain, which - when the device is in operation - starts the first intermediate drive sprocket of the transmission assembly which is placed on the first transmission assembly shaft which is driven by the sprocket of transmission shaft. In such embodiment, a device for automatic placement of wooden laths on the production line may comprise at least eight self-adjustable bearings so that each drive shaft of the assembly leans on two self-adjusting bearings.

[0016] In one embodiment of this invention, each transmission assembly comprises a coupling providing an ad-

justable connection between the transmission assembly shaft and the eccentric lever.

[0017] It is possible that this device for automatic placement of wooden laths on the production line also comprises a container for wooden laths from which the vacuum gripper takes the wooden laths.

[0018] Control of the device for automatic placement of wooden laths on the production line may be provided by the control system, wherein the control system comprises an inductive sensor and multifunctional timer, whereby, when the device is in operation, the inductive sensor sends the impulse into the multifunctional timer to delay the operation of the electromagnetic valve.

[0019] When the piston rod releases the shaft with the vacuum grippers and the lath, in the fully down position the inductive sensor is activated, giving the signal to the electromagnetic valves to shut off the vacuum and to blow the pressurized air through the same hose. This enables fast and precise release of the laths to the intended spot into existing moulds. By releasing the pressurized air into plastic hoses we also provide cleaning and blowing out extraction of the wooden sawdust that can get into the hoses and valves during the vacuum gripping.

[0020] The present invention also proposes a line for the production of wooden packaging comprising any version of the device for automatic placement of wooden laths on the production line as described above.

DESCRIPTION OF THE DRAWINGS:

[0021] The figures describe the system and parts of the system in accordance with the essence of the invention and serve as an example, but not as a limitation. The reference signs on the figures denote the parts described or the similar parts. For the parts or sets of the parts that are not denoted by the reference signs on certain figures, they are deemed to be marked by a reference sign corresponding to the one by which the identical part is marked.

[0022] The invention is described in more detail in the accompanying drawings showing:

Figure 1 - shows device for automatic placement of wooden laths on the production line with the sprocket wheel (rear view)

Figure 2 - shows device for automatic placement of wooden laths on the production line with the sprocket wheel (front view)

Figure 3 - shows the detail "A" of the device for automatic placement of wooden laths on the production line with the sprocket wheel (front view)

Figure 4 - shows the device for automatic placement of wooden laths on the production line with the sprocket wheel connected to the vacuum, pressure and electric current

Figure 5 - shows a lateral view of the device for automatic placement of wooden laths on the production

line with the sprocket wheel

A LIST OF REFERENCE SIGNS USED IN THE DRAWINGS

[0023]

- 1-base
- 2-bottom plate
- 3-linear guide
- 4-linear bearing
- 8- distance plate
- 10- housing with bearings
- 12-gripper shaft
- 13-gear
- 14-toothed bar plate
- 15-toothed bar
- 18-vacuum gripper bracket
- 21-self-adjusting bearing
- 24,50-transmission assembly shaft
- 25- eccentric lever
- 27-gear of the sprocket
- 28-intermediate drive gear
- 29-gear of the transmission shaft
- 30-drive transmission gear
- 32-sprocket shaft
- 33-transmission shaft
- 35,37,39,41,42-container for wooden laths
- 43-piston rod
- 44-intermediate drive sprockets of the transmission assembly
- 45-sprocket
- 46- sprocket wheel
- 49- drive chain tensioning system
- 51-upper plate
- 52-push spring
- 53-valve
- 54-vacuum gripper
- 55,56-air hose
- 57-electric cable
- 58- vacuum pump
- 59-air turbine
- 60-distribution cabinet
- 61-drive chain
- 62- intermediate drive chain
- 63- coupling
- 5-linear bearing of the toothed bar
- 16-distance ring
- 17-distance ring guide
- 100-device for automatic placement of wooden laths on the production line
- 200-drive
- 300-transmission assembly
- 400- vacuum grippers assembly

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0024] The embodiments disclosed herein are not intended to be limiting in any way.

[0025] The description of this invention represents one possible embodiment of the device 100 for automatic placement of wooden laths on the production line. The given description does not in any way limit the other possible embodiments of such a device, particularly related to the use of different drives and transmission assemblies and devices. Elements: base 1, bottom plate 2 and upper plate 51 are typically performed as welded steel structure; these elements are then interconnected and constitute the construction of the device as shown in Figure 2. If the entire device 100 for automatic placement of wooden laths on the production line is mounted on the existing line for the production of wooden packaging, the sprocket wheel 46 shall be mounted on the drive shaft of the already existing machine for the production of wooden elements.

[0026] Via the drive chain 61, the movement is transmitted to the sprocket 45 of the device. The sprocket 45 of the device is mounted on the sprocket shaft 32, with which it is rigidly mounted by means of a metal wedge as shown in Figure 1. On the other side of the sprocket shaft 32 of the device, a gear of the sprocket 27 is mounted and is rigidly connected to the shaft. The gear of the sprocket 27 further transmits movement to a drive transmission gear 30 which is rigidly mounted to the sprocket shaft of the device 32. Furthermore, on the other side of the sprocket shaft 32, an intermediate drive gear 28 is rigidly mounted to that shaft 32. It further transmits the movement to the gear of the transmission shaft 29 which is mounted on the transmission assembly shaft 24 as shown in Figure 1. Transmission assembly shaft 24, 50 leans on the housing with self-adjusting bearings 21, which provide easy adjustment of the mentioned shafts. In the middle of the first transmission assembly shaft 24, there is an intermediate drive sprockets of the transmission assembly 44 which is rigidly mounted to that shaft. On the front side of the transmission assembly shaft 24, there is a coupling 63 (trade name of the type KLHH 30/52), which provides an adjustable connection to the eccentric lever 25 as shown in Figure 2. The intermediate drive sprockets of the transmission assembly 44 which are rigidly mounted to the transmission assembly shaft 50 via the intermediate drive chain 62, are interconnected and ensure the identical movement of the whole assembly. The eccentric lever 25 is connected to a hinge joint with the piston rod 43, which turns the circular motion of the transmission assembly shafts 24, 50 into the linear motion. Linear guides 3 and linear bearings 4 ensure the precise vertical rectilinear movement, as well as the device stability and long life span. On the linear bearings 4, by means of the hexagonal screws, a distance plate 8 is screwed. On the distance plate 8, the housing with the bearings 10 is screwed, through which the gripper

shaft 12 passes. On the front part of the gripper shaft 12, the other side of the piston rod 43 is mounted. The gear 13, which is mounted on the gripper shaft 12 and is meshed with the toothed bar 15 serves to rotate the gripper shaft 12 by 180 degrees. The toothed bar 15 is screwed onto the toothed bar plate 14, which has a linear bearing of the toothed bar 5 on the rear, and follows the vertical rectilinear movement of the gripper shaft 12 and gears 13. On the front side of the toothed bar plate 14, there is a distance ring 16 which pushes the springs 52. The springs 52 serve for precise stopping of the toothed bar plate 14 and thereby ensure precise rotation of the gripper shaft 12 in the exactly chosen moment. Described here is the operation of one section, wherein the whole device comprises a total of four sections in a row, one next to another, which are interconnected and work synchronized.

[0027] On the gripper shaft 12, depending on the need, from 4 to 6 vacuum gripper brackets 18 are mounted, to which the rubber vacuum grippers 54 are attached. They provide a vacuum gripping of wooden laths. Elements 35, 37, 39, 41 and 42 are interconnected and constitute a container for wooden laths. They can be adjusted depending on the dimensions of the laths. The drive chain tensioning system 49 comprises two sprockets, which are shown in Figure 1, and serve for tightening the chain 61. On the upper plate 51, there are 24 electromagnetic valves 53 installed - six for each section. The vacuum pump 58 is a starting point for the rubber flexible hose 55 which at the end branches into 24 outputs, each of which is connected with one electromagnetic valve 53. The air turbine 59 is, via the flexible rubber hose 56, which at the end branches into 24 outputs, connected with electromagnetic valves 53. Each electromagnetic valve 53 is connected by a thin plastic hose to one vacuum gripper 54.

[0028] The process is initiated by turning the control switch (trade sign HB2-BD41) with one normally open contact (protection IP65) whereby the control switch is located on the distribution cabinet 60.

[0029] The power supply of the distribution cabinet has built-in overvoltage protection, overload and short circuit, and is realized with a 3x2.5 mm² cable from the existing machine. Furthermore, via an inductive sensor (trade sign LM12-3002NA) which sends the impulse to a multifunctional timer (trade sign DHC 19M) for delaying the operation of the electromagnetic valve with an auxiliary relay. The process endlessly repeats with each new impulse of the inductive sensor. Each electromagnetic valve 53 is connected by an electric cable 57 of a thickness of 2x0.75 mm² with a distribution cabinet 60. In one further embodiment the device (100) for automatic placement of wooden laths on the production line comprises four transmission assemblies (300) and four vacuum grippers assemblies (400) so that each transmission assembly (300) is connected to one vacuum grippers assembly (400). Further, in one of this embodiments the drive (200) further comprises four intermediate drive

sprockets of the transmission assembly (44) and intermediate drive chain (62), wherein on each of the four transmission assembly shafts (24,50) there is one intermediate drive sprocket of transmission assembly (44) wherein the sprockets are driven by intermediate drive chain (62), which - when the device (100) is in operation - starts the first intermediate drive sprocket of the transmission assembly (44) which is placed on the first transmission assembly shaft (24) which is driven by the sprocket of transmission shaft (29).

[0030] In another embodiment the device (100) for automatic placement of wooden laths on the production line comprises at least eight self-adjustable bearings (21) so that each drive shaft of the assembly (24, 50) leans on two self-adjusting bearings (21). Usually each transmission assembly (300) comprises a coupling (63) providing an adjustable connection between the transmission assembly shaft (24, 50) and the eccentric lever (25).

[0031] As an integral part of the device (100) for automatic placement of wooden laths on the production line could be comprised a container for wooden laths from which the vacuum gripper takes the wooden laths (35, 37, 39, 41, 42).

[0032] Also, the device (100) for automatic placement of wooden laths on the production line could comprise the control system, wherein the said control system comprises an inductive sensor and multifunctional timer, whereby, when the device (100) is in operation, the inductive sensor sends the impulse into the multifunctional timer to delay the operation of the electromagnetic valve (53). Also, in one such an embodiment it is realized that when the piston rod (43) releases the shaft (12) with the vacuum grippers (54) and the lath, in the fully down position the inductive sensor is activated, giving the signal to the electromagnetic valves (53) to shut off the vacuum and to blow the pressurized air through the same hose.

Claims

1. The device (100) for automatic placement of wooden laths on the production line which comprises a base (1) and a drive system (200), **characterized in that** it further comprises at least one transmission assembly (300) and at least one vacuum grippers assembly (400), wherein, when the device (100) is in operation, the transmission assembly (300) controls the movement of the vacuum grippers assembly (400), which grips the wooden lath, so that the transmission assembly (300) moves the vacuum grippers assembly (400) together with the wooden lath and positions the wooden lath on the production line, in which moment, the vacuum grippers assembly (400) releases the wooden lath, wherein the whole process continuously repeats itself as the production line moves.
2. The device for automatic placement of wooden laths on the production line, as claimed in claim 1, **characterized in that** the vacuum grippers assembly (400) comprises a gripper shaft (12), at least one vacuum gripper (54) which is mounted on the gripper shaft (12), one or more air hoses and one or more valves (53), wherein the number of the vacuum grippers (54) is equal to the number of valves (53) and the number of air hoses and wherein each of the vacuum grippers (54) is connected to one valve (53) via an air hose, so that the valve (53) opens - when the vacuum gripper (54) is in position to grip the wooden lath - and herewith allows the air suction from the space formed by the vacuum gripper (54) and the wooden lath, and then the vacuum gripper (54) firmly grips the lath, and at the moment when the vacuum gripper (54) needs to release the lath on the production line, the valve (53) opens and, through the air hose line (55), the air is blown into the space formed by a vacuum gripper (54) and a wooden lath, so that the vacuum gripper (54) releases the wooden lath on the production line.

acterized in that the vacuum grippers assembly (400) comprises a gripper shaft (12), at least one vacuum gripper (54) which is mounted on the gripper shaft (12), one or more air hoses and one or more valves (53), wherein the number of the vacuum grippers (54) is equal to the number of valves (53) and the number of air hoses and wherein each of the vacuum grippers (54) is connected to one valve (53) via an air hose, so that the valve (53) opens - when the vacuum gripper (54) is in position to grip the wooden lath - and herewith allows the air suction from the space formed by the vacuum gripper (54) and the wooden lath, and then the vacuum gripper (54) firmly grips the lath, and at the moment when the vacuum gripper (54) needs to release the lath on the production line, the valve (53) opens and, through the air hose line (55), the air is blown into the space formed by a vacuum gripper (54) and a wooden lath, so that the vacuum gripper (54) releases the wooden lath on the production line.

3. The device for automatic placement of wooden laths on the production line, as claimed in claim 2, **characterized in that** the valve (53) is an electromagnetic valve.
4. The device for automatic placement of wooden laths on the production line, as claimed in claims 2 or 3, **characterized in that** it comprises a vacuum pump (58) and an air turbine (59), which are connected to one or more electromagnetic valves (53) by means of air hose line (55,56).
5. The device for automatic placement of wooden laths on the production line, as claimed in claim 4, **characterized in that** the vacuum grippers assembly (400) comprises four vacuum gripper brackets (18), each fitted with one rubber vacuum gripper (54), wherein it further comprises four electromagnetic valves (53) which are connected to the vacuum pump (58) by means of a flexible rubber hose (55) which branches into four outputs, wherein each output is connected to one electromagnetic valve (53), while the air turbine (59) is connected via the flexible rubber air hose (56) which branches into four outputs and where each output is connected to one electromagnetic valve (53).
6. The device for automatic placement of wooden laths on the production line, as claimed in claim 4, **characterized in that** the vacuum grippers assembly (400) comprises six vacuum gripper brackets (18), each fitted with one rubber vacuum gripper (54), and it further comprises six electromagnetic valves (53) which are connected to the vacuum pump (58) by means of a flexible rubber hose (55) which branches into six outputs, wherein each output is connected to one electromagnetic valve (53), while the air turbine (59) is connected via the flexible rubber air hose (56) which branches into six outputs and where each output is connected to one electromagnetic valve (53).

bine (59) is connected via the flexible rubber air hose (56) which at the end branches into six outputs and where each output is connected to one electromagnetic valve (53).

7. The device (100), as claimed in any of claims from 2 to 6, **characterized in that** the transmission assembly (300) comprises a shaft of transmission assembly (24) driven by a drive (100); it further comprises an eccentric lever (25) and a piston rod (43) which are connected to a hinge joint with one end of the piston rod (43), while at the other end, the piston rod (43) is mounted on the gripper shaft (12), and wherein the piston rod (43), when the device (100) is in operation, turns the circular motion of the transmission assembly shaft (24) into the linear motion of the shaft (12).
8. The device (100) for automatic placement of wooden laths on the production line, as claimed in claim 7, **characterized in that** it comprises a bottom plate (2) and an upper plate (51), wherein the transmission assembly (300) further comprises a distance plate (8), a linear guide (3) and a linear bearing (4), while the vacuum grippers assembly (400) also comprises a housing with bearings (10), wherein the gripper shaft (12) passes through the housing, in such a way that the gripper shaft (12) in the device's drive (100) rotates inside the housing with bearings (10), wherein the linear guide (3) is wedged between the bottom plate (2) and the upper plate (51), wherein the housing with bearings (10) is fixed to a distance plate (8) which is placed on the linear bearing (4) that slides along the linear guide (3).
9. The device (100) for automatic placement of wooden laths on the production line, as claimed in claim 8, **characterized in that** the transmission assembly (300) may further comprise a gear (13) and a toothed bar (15), wherein the gear (13) is meshed with the toothed bar (15) and mounted on the gripper shaft (12), and wherein the gripper shaft (12) rotates by 180° when the device (100) is in operation, which is caused by the passing gear (13) over the toothed bar (15).
10. The device (100) for automatic placement of wooden laths on the production line, as claimed in claim 9, **characterized in that** the transmission assembly (300) also comprises a toothed bar plate (14) and a linear bearing of the toothed bar (5) which is wedged between the bottom plate (2) and the upper plate (51), wherein the toothed bar (15) is screwed on the toothed bar plate (14), and wherein when the drive (100) is in operation, the toothed bar plate (14) slides along the linear bearing of the toothed bar (5) so that it follows the vertical rectilinear movement of the gripper shaft (12) and the gear (13).

11. The device (100) for automatic placement of wooden laths on the production line, as claimed in claim 10, **characterized in that** the transmission assembly (300) further comprises a distance ring (16) fixed to the toothed bar plate (14), a distance ring guide (17) and two springs (52) which are placed on the upper and the lower side of the said distance ring guide (17), while between these springs, a distance ring (16) is placed, which distance ring (16) presses one of the two springs (52) every time, depending on whether the distance ring (16) moves downwards or upwards, wherein the distance ring guide (17) is wedged between the bottom plate (2) and the upper plate (51), so that when the device (100) is in operation, the springs (52) precisely stop the toothed bar plate (14) and thereby ensure precise rotation of the gripper shaft (12).

12. The device (100) for automatic placement of wooden laths on the production line, as claimed in any of claims from 7 to 11, **characterized in that** the drive (200) comprises a sprocket wheel (46) which can be driven by an existing machine for the production of wooden elements or by any other external drive, which further comprises a drive chain (61), a sprocket (45), a sprocket shaft (32) and a gear of the sprocket of the device (27), wherein the sprocket wheel (46) drives the drive chain (61) which transmits movement to the sprocket (45), which is mounted on the sprocket shaft (32) of the device, on which the gear of the sprocket wheel of the device (27) is also rigidly mounted, wherein the drive (200) further comprises a transmission shaft (33) to which the transmission gears (30) and the intermediate drive gear (28) are rigidly mounted; furthermore, the drive (200) comprises a gear of the transmission shaft (29) which is mounted on the drive shaft of transmission assembly (24) in such a way that it can rotate around that gear, wherein the gear of the sprocket of the device (27) transmits movement to the drive transmission gears (30), which - when device (100) is in operation - causes the transmission shaft (33) to rotate together with the intermediate drive gear (28), which transmits movement to the gear of the transmission shaft (29), wherein the said gear (29) rotates the drive shaft of the transmission assembly (24).

13. The device (100) for automatic placement of wooden laths on the production line, as claimed in claim 12, **characterized in that** the drive (200) comprises a chain tensioning system (61) (49).

14. The device (100) for automatic placement of wooden laths on the production line, as claimed in any of the previous claims, **characterized in that** comprises four transmission assemblies (300) and four vacuum grippers assemblies (400) so that each transmission assembly (300) is connected to one vacuum grippers

assembly (400).

15. A line for production of wooden packaging, **characterized in that** it comprises the device (100) for automatic placement of wooden laths on the production line, as claimed in any of the previous patent claims.

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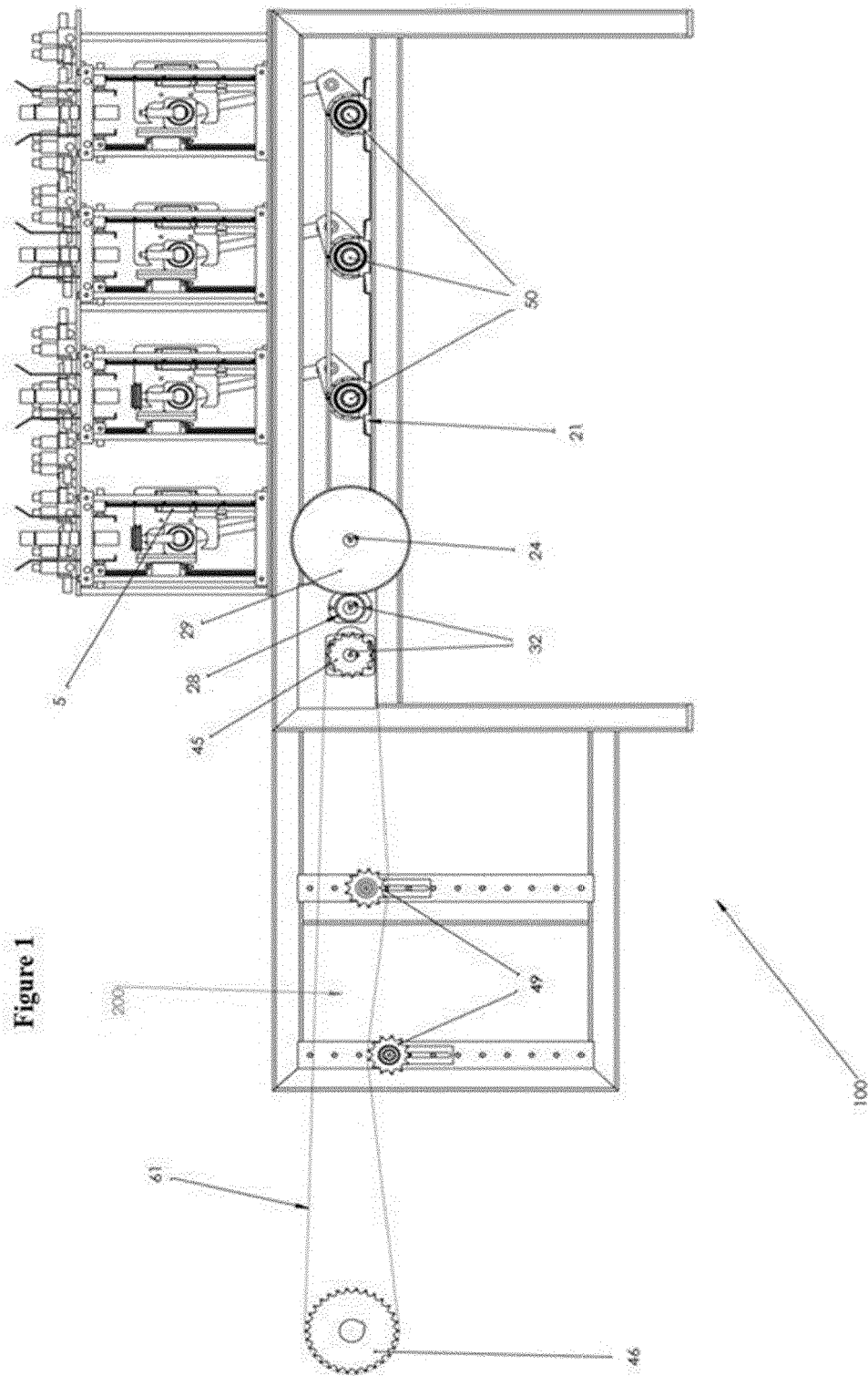
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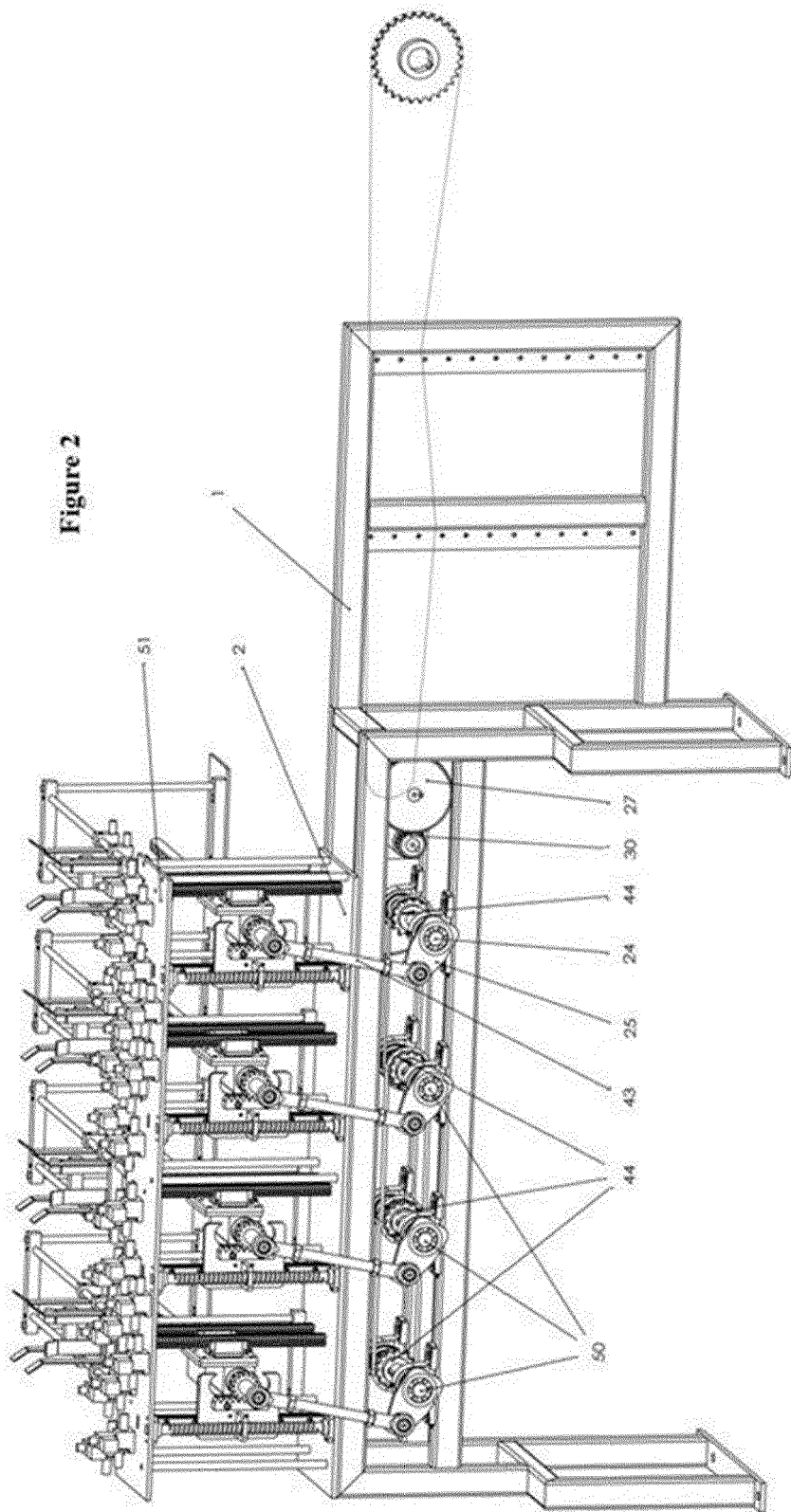
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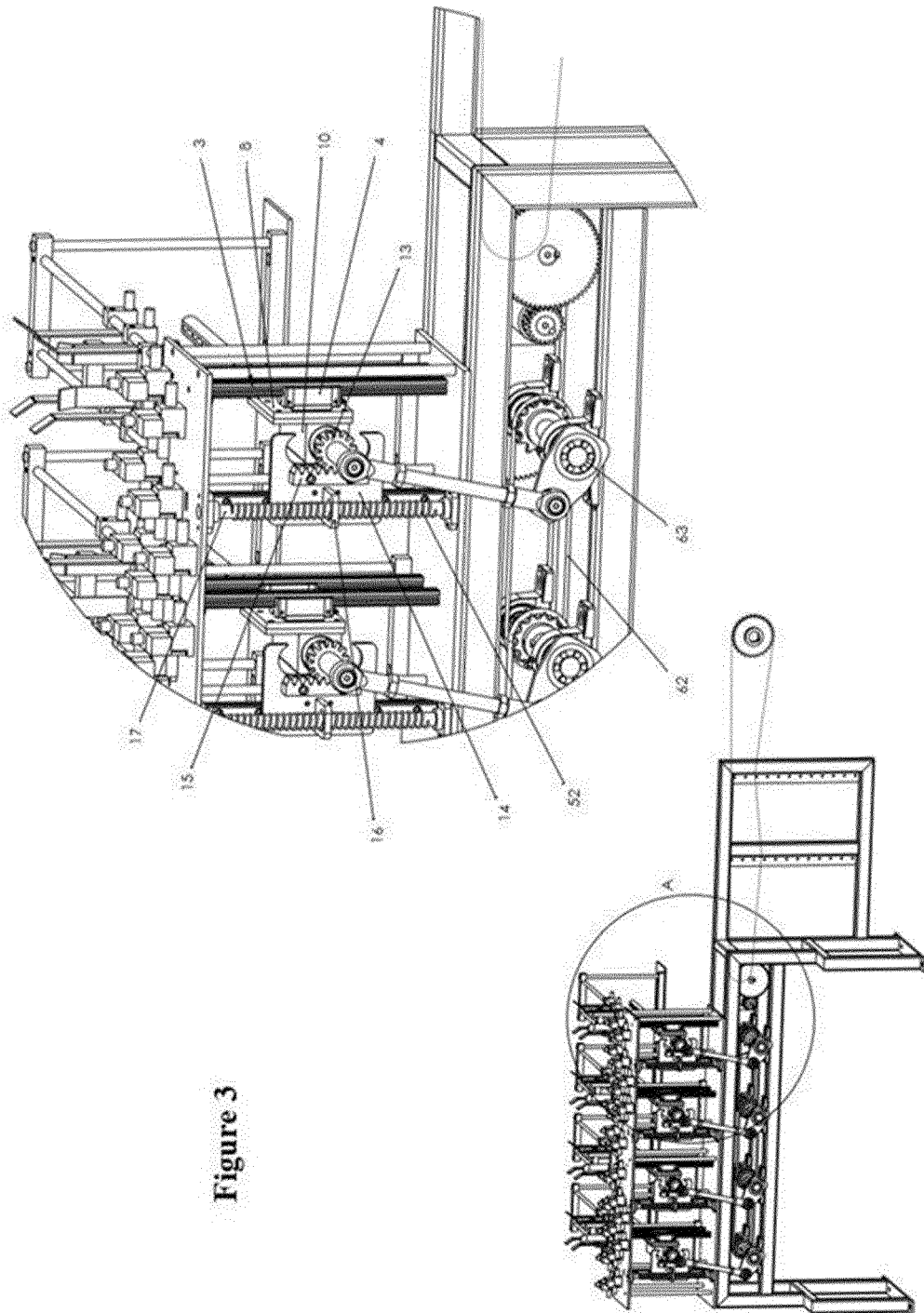
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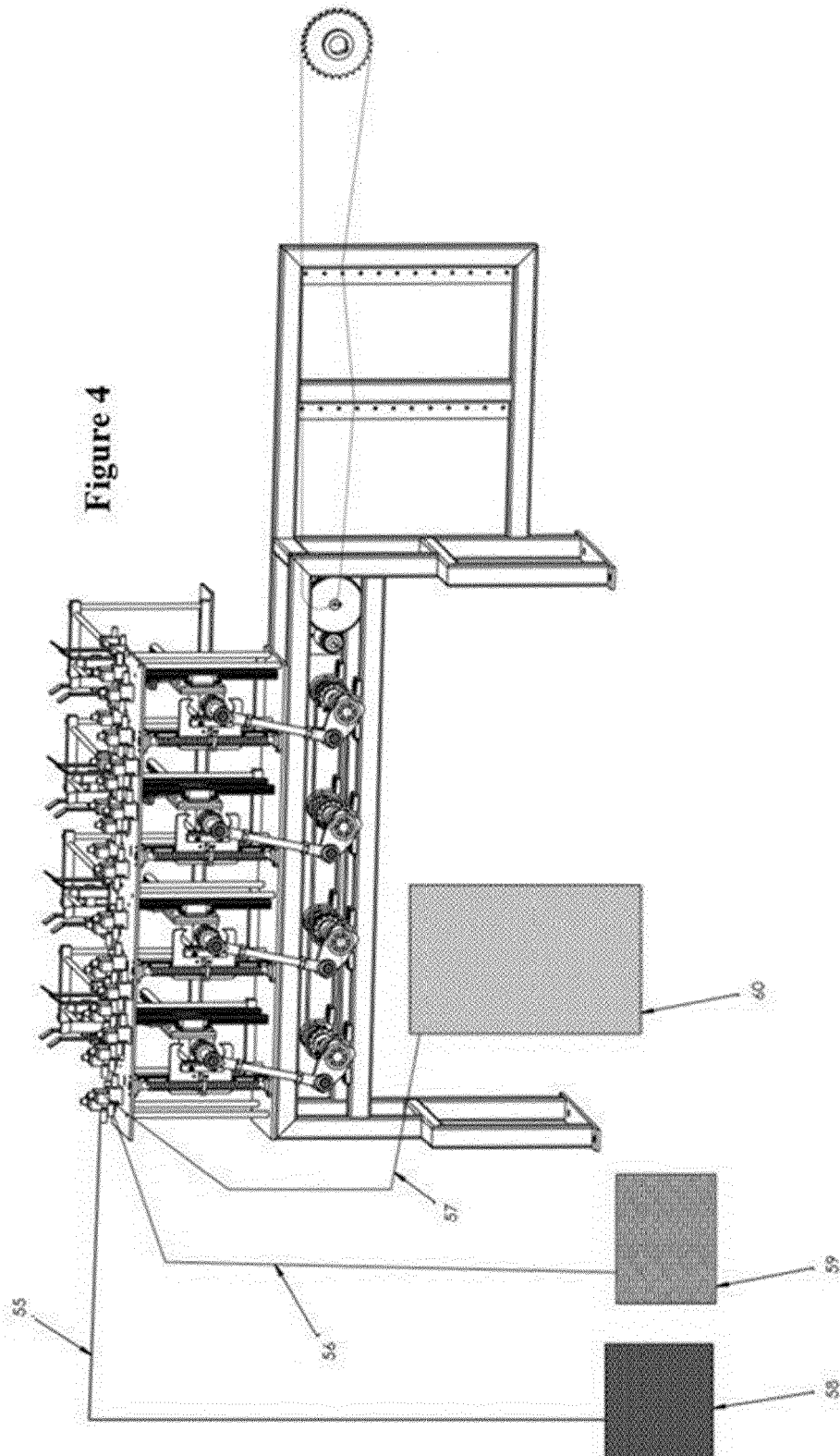
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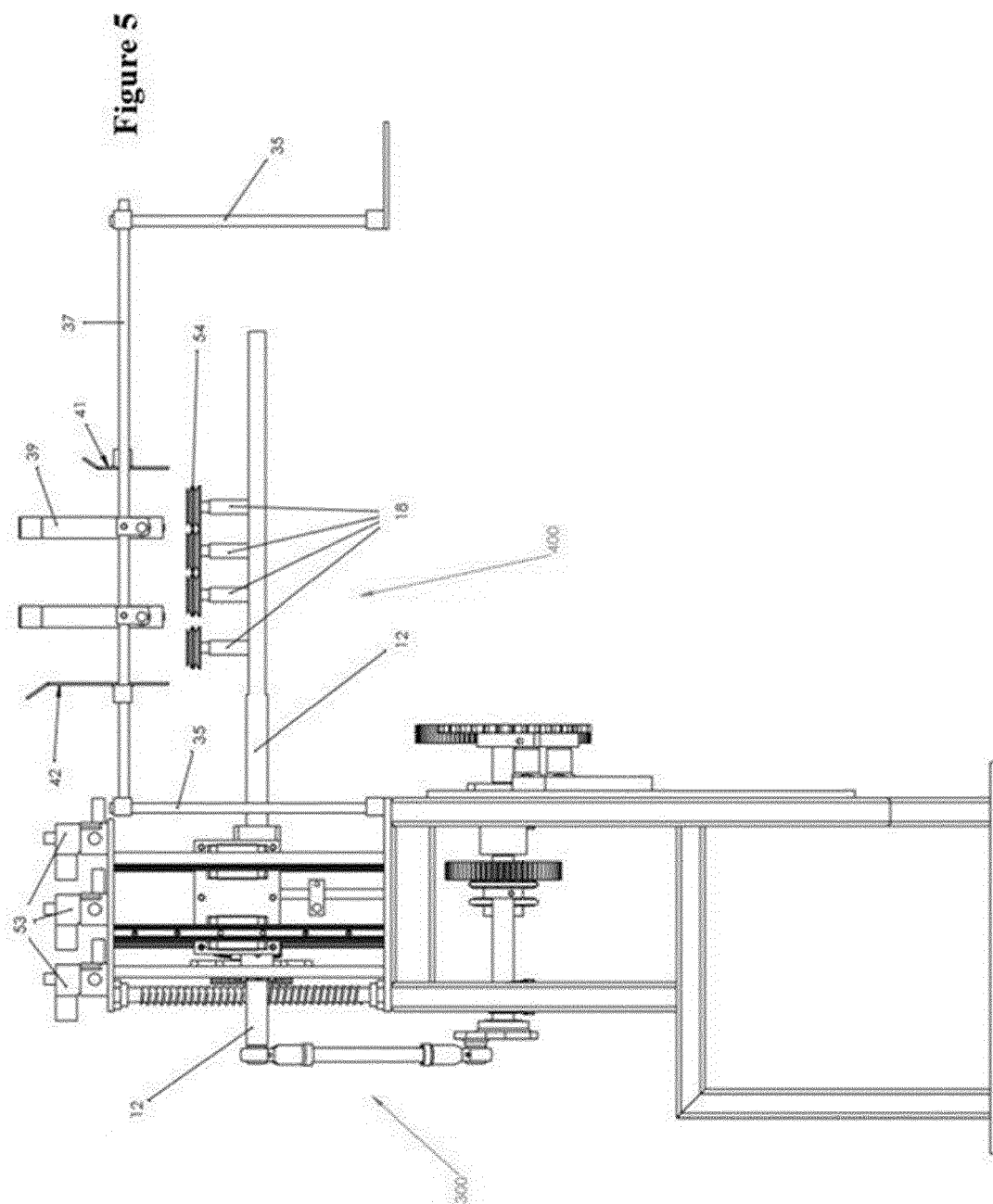
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EUROPEAN SEARCH REPORT

Application Number
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A	EP 2 444 215 A1 (CORALI SPA [IT]) 25 April 2012 (2012-04-25)	1,15	
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			TECHNICAL FIELDS SEARCHED (IPC)
			B65H B27L B27M
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 March 2019	Examiner Henningsen, Olle
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82