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(54) MACHINE FOR PROCESSING HIDES

(57) A machine for processing hides, which comprises conveyance means (2) for the hide being processed along an advancement route and at least one processing station (3), which is positioned along the above said advancement route and is provided with at least one work cylinder (4) which can be actuated so as to rotate by an electric motor (5). There are also detection means for detecting the position of the hide at the processing station (3). According to the invention, the detection means comprise detector means (6) for at least one electromechanical parameter correlated with the operation of the electric motor (5).

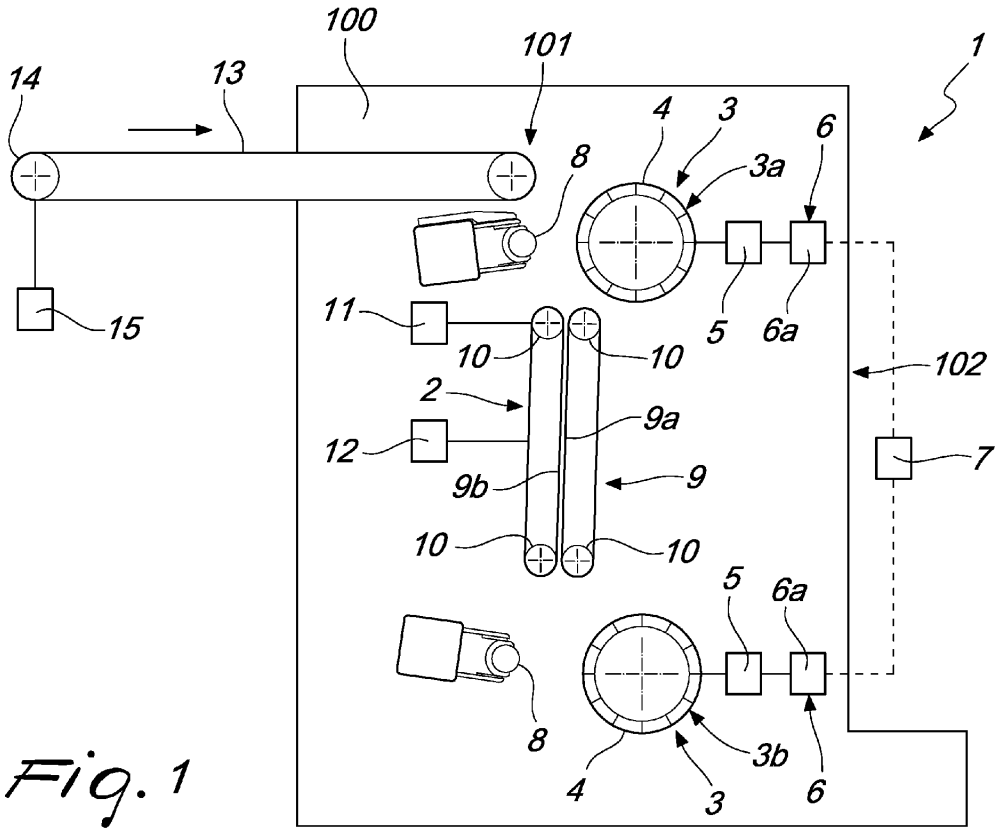

Fig. 1

EP 4 215 626 A1

Description

[0001] The present invention relates to a machine for processing hides.

[0002] Machines for processing hides are known which have, generally, conveyance means, which enable the advancement of the hide along an advancement route, and which are provided with at least one processing station, arranged along the advancement route of the hide and provided with elements that are designed to work on the hide to be processed.

[0003] In particular, the elements of the processing station that are designed to work on the hide can comprise a work cylinder which is rotated, about its own axis, by drive means, usually constituted by an electric motor, and which cooperates with a contrast element, arranged opposite thereto, the function of which is to keep the hide being processed held against the work cylinder.

[0004] In some types of machines, such as, for example, fleshing machines, the work cylinder is constituted by a scraper cylinder, which is provided with blades for removing superfluous surface portions or residues of previous processing from a face of the hide.

[0005] One problem with the machines described above is the problem of knowing the position of the hide being processed at the processing station and, in particular, of knowing the start time and end time of the processing executed on the hide in the processing station, so as to be able to activate or deactivate, on the basis of this knowledge, the movement of the hide made by the conveyance means therefor.

[0006] Currently, the command that enables the actuation of the conveyance means for the hide is imparted on the basis of signals originating from detector means of various types, such as photocells, vision systems, sensors, electromechanical switches or timers.

[0007] In particular, photocells, as is known, produce a beam of electromagnetic radiation, which can be luminous or non-luminous and which is positioned so as to transversely pass through the advancement route of the hide.

[0008] More specifically, photocells make it possible to send the above mentioned command to activate or deactivate the conveyance means for the hide, following the blocking by the hide of the beam produced by the photocells.

[0009] The use of photocells in machines for processing hides exhibits drawbacks, which are caused by the ease with which the lenses of the photocells can be soiled, rendering those photocells unusable, insofar as they are arranged by necessity in places very close to the operational areas of the machine, which normally are greatly fouled by vapors and fat particles.

[0010] Vision systems can be of various types and substantially they detect the presence of the hides and, once this condition is detected, they actuate the required device.

[0011] Vision systems also present drawbacks.

[0012] In particular, their main drawback is constituted by the difficulty to be positioned on the machine and in identifying the most suitable area for their installation and their correct operation.

[0013] As with photocells, vision systems are also subjected to soiling by the dirt present in the operational area of the machine.

[0014] Furthermore, vision systems have the drawback of being quite expensive.

[0015] Other known systems are based on the use of sensors, such as for example devices of the encoder type, which can identify a given position or the advancement of the conveyance means, by counting the number of displacement units executed by the conveyance means with respect to an initial position, and, as a function of this count, these encoder devices make it possible to determine the position of the hides arranged on the conveyance means.

[0016] These sensors, in machines for processing hides, can supply incorrect measurements of the position of the hide, in that the hide, being slippery, can slide with respect to the conveyance means, with the consequence that the sensors can perfectly detect the position of the conveyance means but not the actual position of the hide.

[0017] Other commonly-used systems, such as electromechanical switches and timers, also can not obtain the exact position of the hide during the processing.

[0018] The aim of the present invention is to provide a machine for processing hides that is capable of avoiding the drawbacks of the known art in one or more of the above mentioned aspects.

[0019] Within this aim, an object of the invention is to provide a machine for processing hides in which it is possible to detect with precision the position of the hide being processed.

[0020] Another object of the invention is to provide a machine for processing hides in which the detection of the position of the hide is not subject to the presence of fouling matter during the processing.

[0021] Another object of the invention is to provide a machine for processing hides, in which the detection of the position of the hides does not require a special positioning of sensors in order to be capable of operating correctly.

[0022] Another object of the present invention is to provide a machine for processing hides that is capable of offering the widest guarantees of reliability and safety in its operation.

[0023] A further object of the present invention is to overcome the drawbacks of the background art in a manner that is alternative to any existing solutions.

[0024] Another object of the invention is to provide a machine for processing hides that can be structurally simple to provide and which can be obtained using elements that are readily available on the market, so as to be competitive from a purely economic viewpoint as well.

[0025] This aim and these and other objects which will become more apparent hereinafter are achieved by a

machine for processing hides according to claim 1, optionally provided with one or more of the characteristics of the dependent claims.

[0026] Further characteristics and advantages of the invention will become better apparent from the detailed description that follows of a preferred, but not exclusive, embodiment of the machine for processing hides according to the invention, which is illustrated for the purposes of non-limiting example in the accompanying drawings wherein:

Figure 1 is a schematic view of a possible embodiment of the machine according to the invention;
Figures 2 to 4 show a sequence of operating steps of the embodiment of Figure 1.

[0027] With reference to the figures, the machine for processing hides according to the invention, generally designated by the reference numeral 1, comprises conveyance means 2 for the hide being processed along an advancement route and at least one processing station 3, which is positioned along the advancement route of the hide.

[0028] Conveniently, the conveyance means 2 and each processing station 3 are arranged on a supporting structure 100 for the machine.

[0029] In particular, each processing station 3 is provided with at least one work cylinder 4, which can be actuated to rotate by an electric motor 5.

[0030] The machine is provided with detection means for detecting the position of the hide at the processing station 3.

[0031] The above mentioned detection means comprise detector means 6 for at least one electromechanical parameter correlated with the operation of the electric motor 5.

[0032] Advantageously, the conveyance means 2 are controlled by the detector means 6, so that the operation of the conveyance means 2 depends on the signals coming from the detector means 6.

[0033] In particular, there are, conveniently, control means 7, which are constituted, for example, by an electronic control unit, and which are functionally connected to the detector means 6 and are adapted to drive the conveyance means 2.

[0034] More specifically, the cited control means 7 are configured to vary the operation of the conveyance means 2 as a function of the values of the electromechanical parameter detected by the detector means 6.

[0035] Preferably, the detector means 6 comprise a sensor 6a which is adapted to detect the electric current absorbed by the electric motor 5, which, as is known, varies as a function of the load acting on the motor itself.

[0036] In particular, the control means 7 are configured to actuate the activation or the deactivation of the conveyance means 2 on the basis of the variation of the values of electric current absorbed by the electric motor 5, which are detected by the sensor 6a, with respect to at least one reference threshold value.

[0037] With reference to the embodiment illustrated, the machine can be provided, on the framework 100, with at least two processing stations 3 located along the advancement route of the hide which is defined by the conveyance means 2, between an entry zone 101 for the hide to be processed in the machine and an exit zone 102 for the processed hide from the same machine.

[0038] In particular, the processing stations 3 are arranged one above the other. Thus, for example, there can be a first processing station, positioned in the upper part of the framework 100 and specifically indicated with 3a, and a second processing station arranged below the first processing station and indicated with 3b.

[0039] The work cylinder 4 of each processing station 3 can be constituted, for example, by a scraper cylinder, i.e. by a cylinder that is fitted peripherally with blades designed to remove a surface layer of the hide being processed.

[0040] The working cylinders 4 of both processing stations 3 can be rotationally actuated by a single electric motor 5, which is connected to the working cylinders 4 via a mechanical transmission, constituted for example by a belt or a chain, or, as in the example shown in the figures, each one of the working cylinders 4 can be functionally connected to a respective electric motor 5 for actuating.

[0041] The detector means 6 are connected to the or to each electric motor 5 that actuates the working cylinders 4, and are in turn connected, advantageously, to the control means 7.

[0042] For example, the or each electric motor 5 is connected to a respective sensor 6a, and each sensor 6a is connected to the control means 7.

[0043] Conveniently, facing the work cylinder 4 of each processing station 3 is a respective abutment element 8, the function of which is to push the hide being processed against the work cylinder 4.

[0044] The abutment element 8 of each processing station 3 advantageously can move, with respect to the framework 100, between a closed or active position, in which it is held close to the corresponding work cylinder 4, so as to keep the hide in contact against the work cylinder 4, and an open or inactive position, in which it is kept away from the corresponding work cylinder 4, so as to allow the passage of the hide through the processing station 3, without the work cylinder 4 being able to act on the hide.

[0045] Conveniently, the conveyance means 2 comprise at least one entrainment assembly 9 for the hide, interposed between the processing stations 3.

[0046] As in the embodiment shown, the entrainment assembly 9 can be constituted by a pair of conveyor belts 9a, 9b, mutually opposite and rolling between at least one pair of transmission rollers 10, of which at least one is motorized, so as to define respective active entrainment portions, which face each other and each one of which is designed to engage a respective face of the hide

being processed.

[0047] Advantageously, the conveyor belts 9a and 9b can be movable on command, with respect to the framework 100, between an operative condition, in which the corresponding active entrainment portions are mutually close together so as to be able to stay in contact with the hide to be processed, and an inoperative condition, in which the corresponding active entrainment portions are mutually spaced apart in order to not engage the hide to be processed.

[0048] Conveniently, the entrainment assembly 9 can move in rotation, with respect to the framework 100, about an axis that is substantially transverse to the longitudinal extension of the active entrainment portions 9a, 9b, between at least one first operative position, in which the active entrainment portions of the conveyor belts 9a, 9b are arranged substantially vertically, in order to enable the entrainment of the hide between one of the processing stations 3 and the next, and at least one second operative position, in which the active entrainment portions of the conveyor belts 9a, 9b are arranged substantially horizontally, in order to enable the entrainment of the hide toward the exit zone 102 of the machine.

[0049] In particular, the entrainment assembly 9 is advantageously provided with a frame, not shown, that supports the conveyor belts 9a, 9b and which is, in turn, mounted so that it can rotate on the framework 100.

[0050] Purely for the purposes of example, second drive means 12 can comprise a motorized pinion, not shown, which is supported so that it can rotate by the frame of the entrainment assembly 9 and meshes with a toothed rack, also not shown, which is integral with the framework 100 and is contoured so that the rolling, along the toothed rack, of the pinion, by virtue of its rotary actuation, produces the movement of the entrainment assembly 9 with respect to the framework 100 between the first and the second operative position.

[0051] The actuation of the conveyor belts 9a, 9b is conveniently done using first drive means 11, while the rotary motion of the entrainment assembly 9 between the first and the second operative position is achieved using second drive means 12.

[0052] The first drive means 11, and also the second drive means 12, are controlled by the detector means 6 and, in particular, they can be controlled by the control unit 7.

[0053] Advantageously, substantially at the entry zone 101, the conveyance means 2 can further comprise at least one feeding mat 13 which enables the movement of the hide to be processed from a loading station 14, where the operators will arrange the hide to be processed on the feeding mat 13, in order to bring it inside the machine, through the entry zone 101.

[0054] The feeding mat 13 is functionally connected for its actuation to third drive means 15.

[0055] The third drive means 15 are also controlled by the detector means 6 and, more specifically, they are controlled by the control means 7.

[0056] The operation of the machine according to the invention is the following.

[0057] With reference to the illustrated embodiment, with the abutment elements 8 of the processing stations 3 in the disengaged position, the entrainment assembly 9 in the first operative position and the conveyor belts 9a, 9b preferably in the inoperative condition, the operators arrange the hide to be processed on the feeding mat 13, at the loading station 14.

[0058] The third drive means 15 actuate the feeding mat 14 so that the hide is brought inside the machine through the entry zone 101.

[0059] When the hide to be processed reaches the end of the feeding mat 14 that is opposite to the end where the loading station 13 is located, the hide to be processed begins to fall from the feeding mat 13, thus getting inserted between the abutment element 8 and the work cylinder 4 of the first processing station 3a and between the two conveyor belts 9a and 9b.

[0060] Once substantially a first, front half of the hide to be processed has in its advancement thus passed the abutment element 8 and the work cylinder 4 of the first processing station 3, the abutment element 8 of the first processing station 9 is transitioned to the engaged position and the conveyor belts 9a, 9b are transitioned to the operative condition, as in the situation shown in Figure 2.

[0061] At this point, with the first drive means 11 activated so that the active entrainment portions of the conveyor belts 9a, 9b can slide in the direction that produces the advancement of the hide being processed in the direction of the second processing station 3, the work cylinder 4 of the first processing station 3a goes to work on the hide being processed, in cooperation with the abutment element 8, working on the second, rear half of the hide.

[0062] In such condition, the sensor 6a connected to the electric motor 5 that actuates the work cylinder 4 of the first processing station 3a detects an increase in the electric current absorbed by the electric motor 5, at least with respect to a reference threshold value, for example an upper threshold value, owing to the increase in the contrasting torque acting on the work cylinder 4, by virtue of the action exerted by the latter on the hide being processed.

[0063] The signals coming from the sensor 6a that detects the absorption of electric current of the electric motor 5 that actuates the work cylinder 4 of the first processing station 3a therefore indicate to the control means 7 that the work cylinder 4 of the first processing station 3 is executing the processing on the hide introduced into the machine.

[0064] The control means 7 can then intervene to deactivate the third drive means 15 in order to prevent the introduction of another hide to be processed into the machine, at least for as long as the hide inserted previously is being processed at the first processing station 3, or they can activate the signaling means for the operators, to alert them that the hide is being processed at the first

processing station 3a.

[0065] Simultaneously, the hide being processed, entrained by the conveyor belts 9a, 9b, steadily proceeds toward the second processing station 3b, where it will be inserted between the corresponding work cylinder 4 and the corresponding abutment element 8.

[0066] When all of the hide being processed has passed the work cylinder 4 of the first processing station 3a, the sensor 6a connected to the electric motor 5 that actuates the work cylinder 4 of the first processing station 3 detects a decrease in the electric current absorbed by the electric motor 5, with respect to a reference threshold value, for example a lower threshold value, by virtue of the reduction in the contrasting torque acting on the work cylinder 4.

[0067] At this point, the signals coming from the sensor 6a that detects the absorption of electric current of the electric motor 5 that actuates the work cylinder 4 of the first processing station 3a indicate to the control means 7 that the processing of the hide at the first processing station 3a is finished and, as a consequence, the control means 7 give the go-ahead for the second processing station 3b to begin the processing on the hide.

[0068] In particular, when the first, front half of the hide, not yet processed, has passed the work cylinder 4 of the second processing station 3b, the control means 7 command the transition of the abutment element 8 of the second processing station 3b from the disengaged position to the engaged position and command the first drive means 11 to invert the direction of sliding of the active entrainment portions of the conveyor belts 9a, 9b, so that the processing of the first, front half of the hide may begin at the second processing station 3b.

[0069] The signals coming from the sensor 6a that detects the absorption of electric current by the electric motor 5 that actuates the work cylinder 4 of the second processing station 3b will therefore indicate to the control means 7 an increase in absorption of the electric current, with respect to the upper reference threshold value, due to the increase in the contrasting torque acting on the work cylinder 4 of the second processing station 3b. Simultaneously, the control means 7 activate the second drive means 12 in order to actuate the steady transition of the entrainment assembly 9 from the first angular position to the second angular position, so that the hide can be sent toward the exit zone 102, as shown in Figures 3 and 4.

[0070] When all of the hide has passed the work cylinder 4 of the second processing station 3, there will be a lowering of the contrasting torque acting on the work cylinder 4 of the second processing station 3, so that the sensor 6a that detects the absorption of electric current by the electric motor 5 that actuates the work cylinder 4 of the second processing station 3, detecting lower absorbed electric current values than the lower reference threshold value, will indicate to the control means 7 that the processing of the hide is finished at the second station 3b as well.

[0071] As a consequence, when the hide is completely extracted from the machine through the exit zone 102, the control means 7 will send the go-ahead to the first, second and third drive means 11, 12, and 15 to actuate the conveyor belts 9a, 9b, the entrainment assembly 9, and the feeding mat 14, so as to be able to begin processing on another hide to be processed.

[0072] In practice it has been found that the invention fully achieves the intended aim and objects, and in particular attention is drawn to the fact that the machine according to the invention makes it possible to detect with precision the position of the hide at its processing stations, and to know in particular the start time and end time of processing of the hide at its processing stations, this information being not influenced by dirt or other factors and without needing to resort to complex detection systems.

[0073] The invention, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0074] Thus, for example, the detector means 6 can also be provided by a torque transducer associated with the shaft of the electric motors 5 that actuate the working cylinders 4 or with the working cylinders themselves.

[0075] Moreover, all the details may be substituted by other, technically equivalent elements.

[0076] In practice the materials employed, provided they are compatible with the specific use, and the contingent dimensions and shapes, may be any according to requirements and to the state of the art.

[0077] The disclosures in Italian Patent Application No. 102022000000782 from which this application claims priority are incorporated herein by reference.

[0078] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A machine for processing hides, which comprises conveyance means (2) for the hide being processed along an advancement route and at least one processing station (3), which is positioned along said advancement route and is provided with at least one work cylinder (4) which can be actuated so as to rotate by an electric motor (5), detection means for detecting the position of the hide at said processing station (3) being provided, **characterized in that** said detection means comprise detector means (6) for at least one electromechanical parameter correlated with the operation of said electric motor (5).

2. The machine according to claim 1, **characterized in**

that said conveyance means (2) are controlled by said detector means (6).

3. The machine according to one or more of the preceding claims, **characterized in that** it comprises control means (7) which are functionally connected to said detector means (6) and which drive said conveyance means (2), said control means (7) being configured to vary the operation of said conveyance means (2) as a function of the values of said electromechanical parameter that are detected by said detector means (6).

4. The machine according to claim 1, **characterized in that** said detector means (6) comprise at least one sensor (6a) that is adapted to detect the electric current absorbed by said electric motor (5).

5. The machine according to claim 3, **characterized in that** said control means (7) are adapted to actuate the activation or deactivation of said conveyance means (2) on the basis of the variation of the values of the electric current absorbed by said electric motor (5), which are detected by said sensor (6a), with respect to at least one reference threshold value.

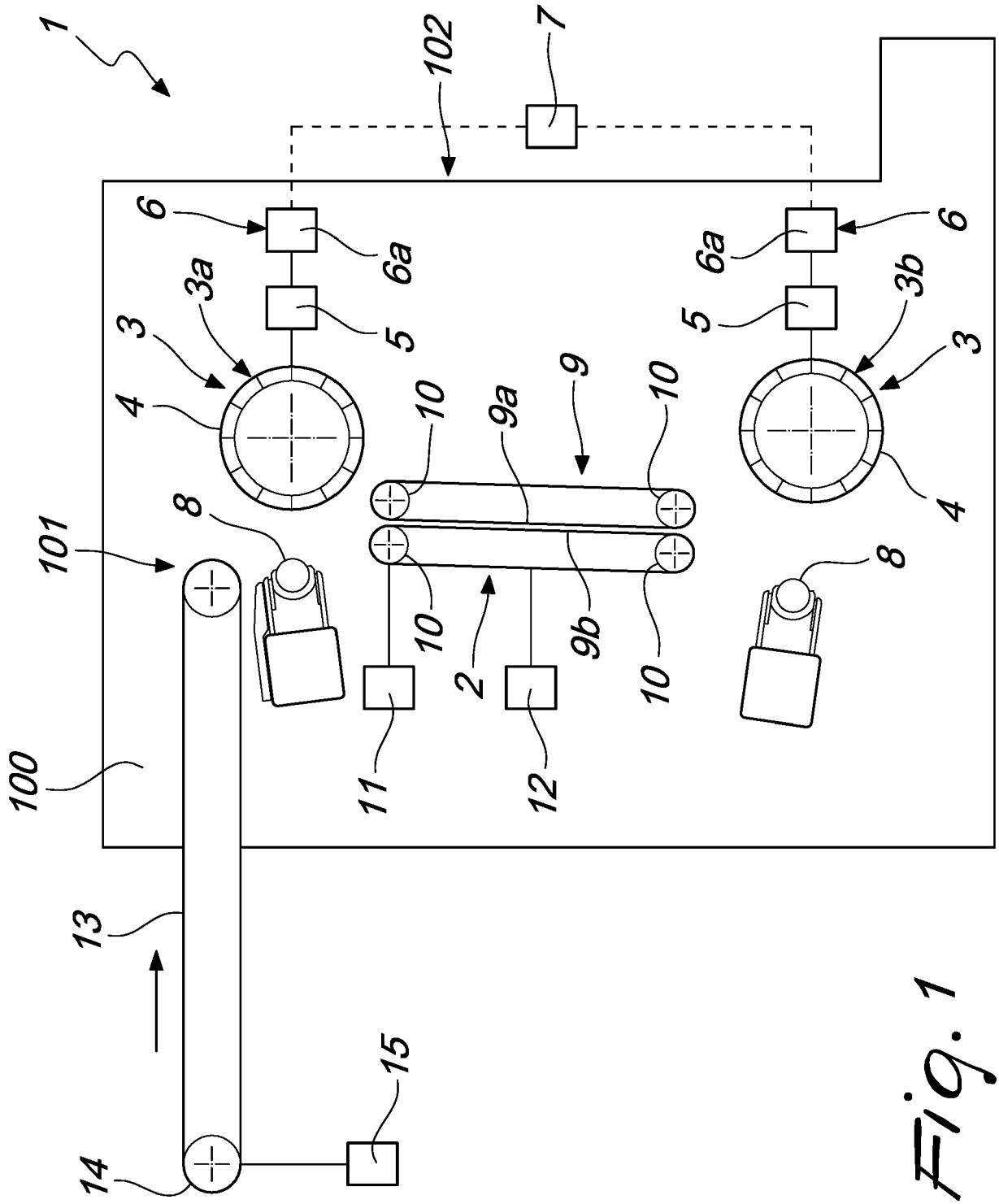
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Fig. 1

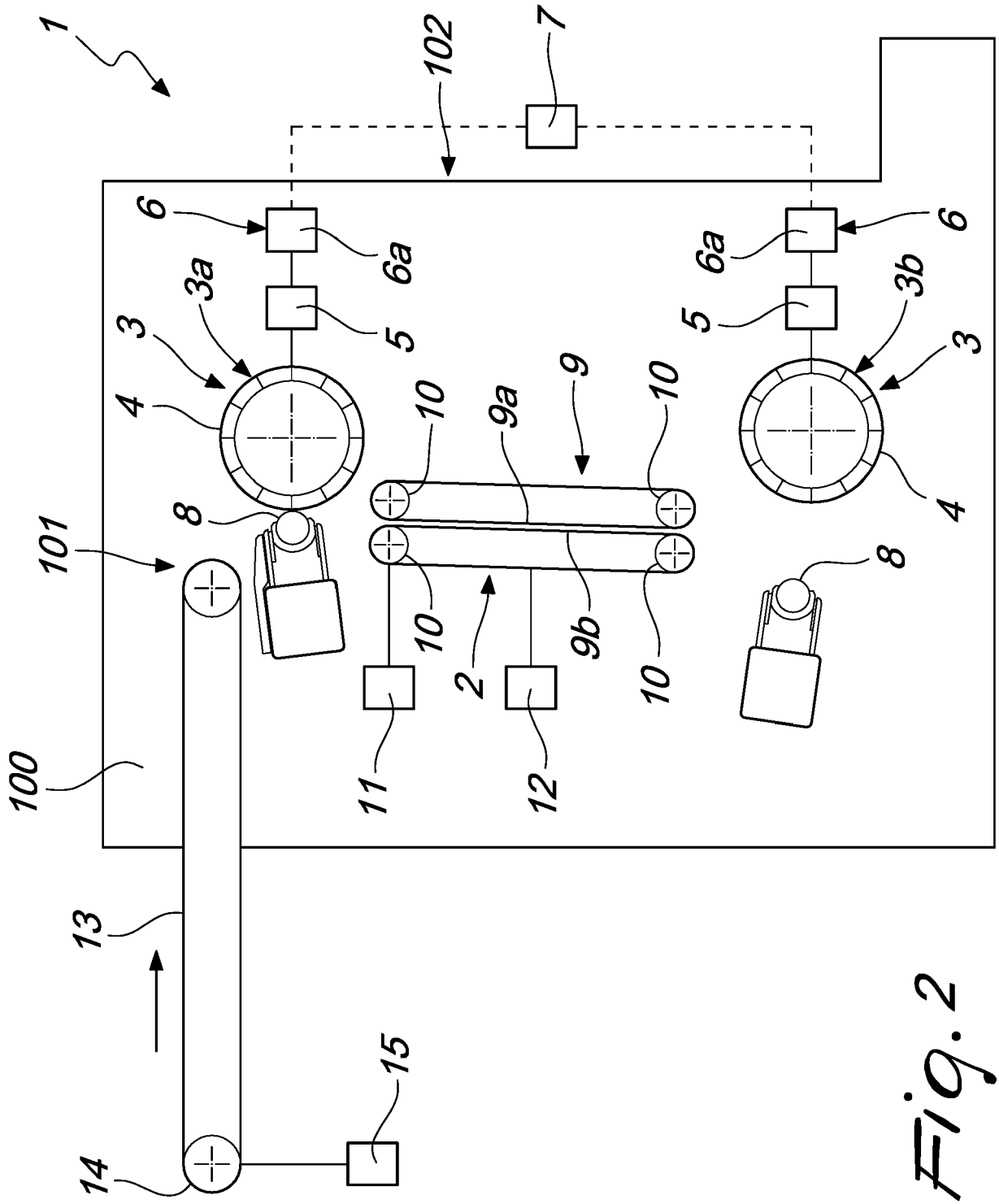
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Fig. 2

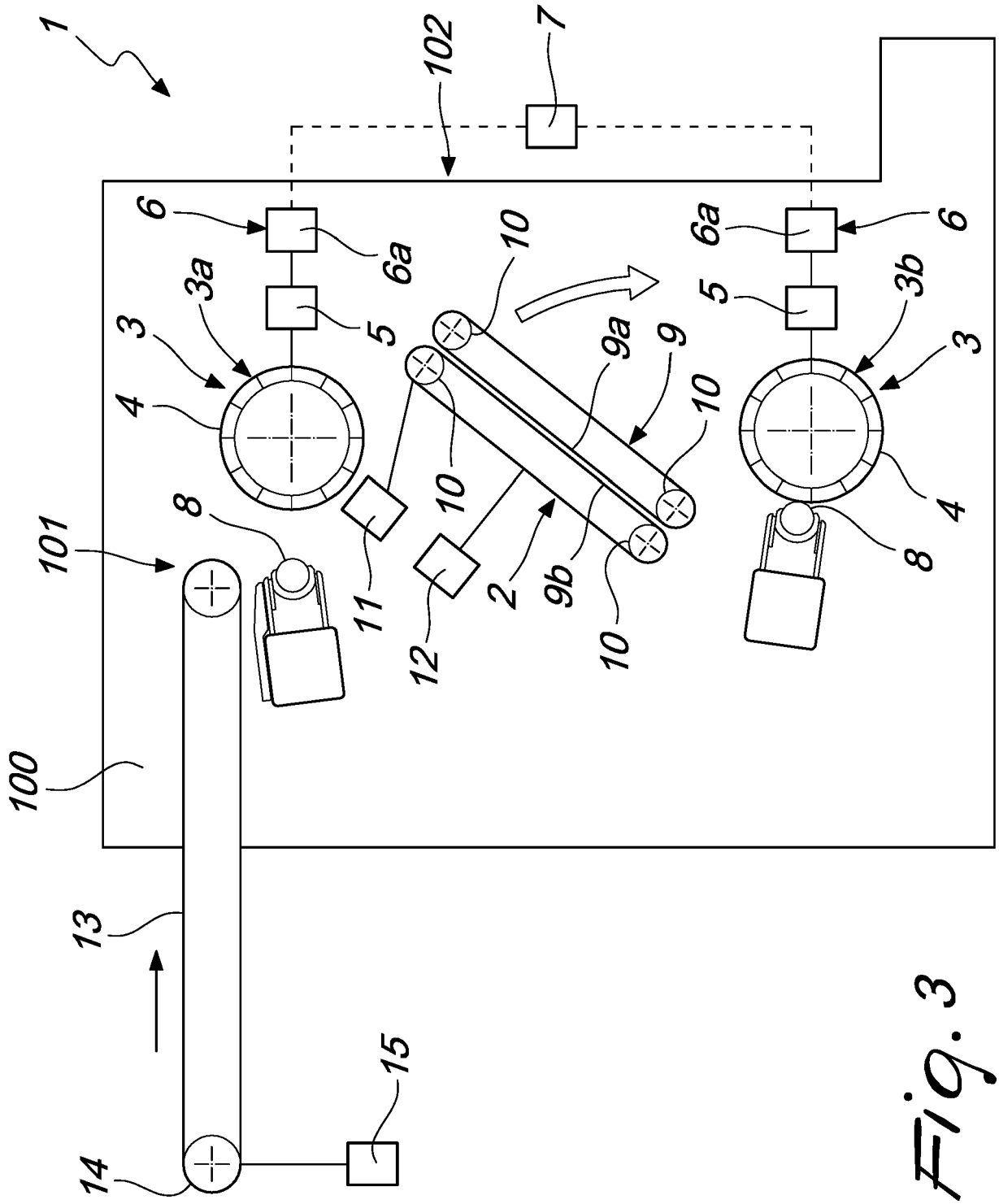
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Fig. 3

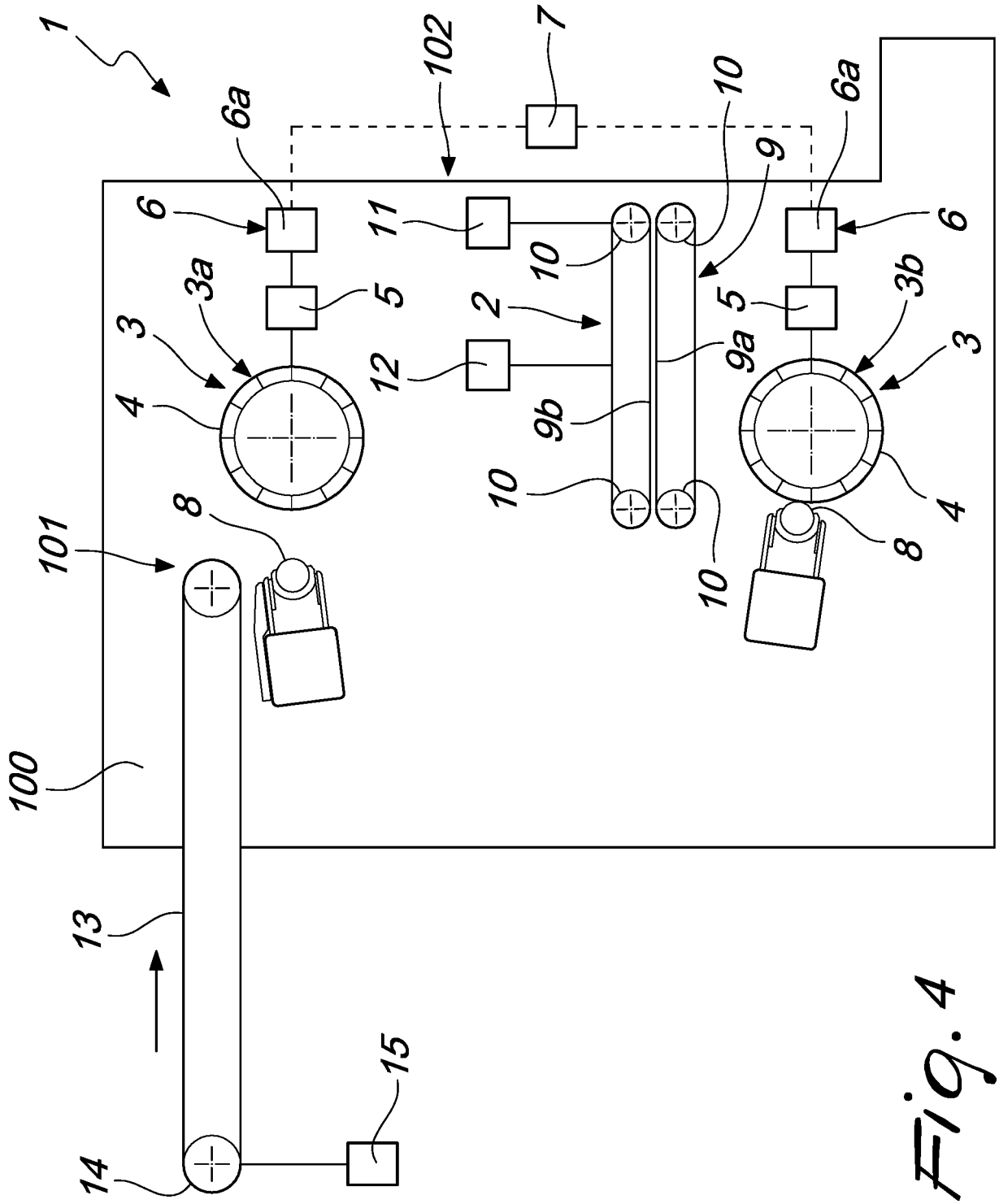
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Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 23 15 1875

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	9 June 2023	Iamandi, Daniela

CATEGORY OF CITED DOCUMENTS

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