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The present invention also relates to a line of production (20) of wrapped blocks of yeast.



Description

TECHNICAL FIELD

[0001] The present invention refers to the field of wrapping machines. More specifically it refers to the field of wrapping machines for wrapping blocks of compressed fresh yeast provided with means for allowing cleaning it from wasted yeast in an easy and reliable manner.

STATE OF THE ART

[0002] The fresh compressed bread baking yeast format is the type of yeast that is mostly used by the artisan baker. It is a product formed exclusively by living cells of a strain of *Saccharomyces Cerevisiae*, with a percentage of water that can vary between 73% and 66% and at a temperature that is recommended not to exceed 10 ° C.

[0003] The fresh compressed baking yeast for professional use is always presented as an orthohedron or block format, with variable dimensions and weight depending on the format. The format is given by the tradition of the product used by the baker, since it has adjusted the recipes of the mixture for the manufacture of bread and in this way, it can be dosed without the need to be weighed. The most commonly used formats are 225g, 453g (1Lb), 500g, 1Kg, 5Lb (2265g) or 2.5Kg.

[0004] Within these weights, there is a great diversity of measures, although normally, the formats are usually elongated, to facilitate extrusion.

[0005] The working principle of wrapping a product, placing the wrapping film or paper above it and making it ascend by means of an elevator to form the wrapping around the upper face of the product and the lateral faces, is a principle of operation widely used in the packaging industry when the product to be wrapped must have fold ends and the production speed must be high, that is, greater than 50 products per minute.

[0006] For compression, an extruder is used and the extruded yeast bar is cut into portions that must be packed immediately, to avoid heating and evaporation of water. Due to the fragility of the product, it must be handled very carefully, from the moment the block is cut until it is wrapped.

[0007] The state of the art discloses wrapping machines for wrapping individual blocks of compressed fresh yeast in a wrap, generally paper with folded ends to make its unwrapping easier. These individual blocks can be cut from an extruded yeast bar. For example, DE582371 discloses a machine for wrapping blocks of compressed fresh yeast. This wrapping machine comprises a plate under which there are drive devices and several eccentric shafts to move the various devices of the wrapping machine. This plate has traditionally been used to increase rigidity of the wrapping machine and to facilitate the design and assembly of the wrapping machine.

[0008] Typically, this plate has been used for support-

ing wrapping folders of the wrapping machine, a wrap feeder and a linear movement guide for lifting the blocks of compressed yeast. As an example, plate 100 of a known type of wrapping machine M is shown in figure 6.

5 As the wrapping folders and a shaft for lifting the blocks are subjected to high accelerations, the machine suffers from vibrations and the plate contributes to providing rigidity and minimizing these vibrations, which result in wear of the machine and a loss of precision in the wrapping process. Thus, a single plate provides the necessary
10 rigidity for the correct operation of the machine.

[0009] Traditionally, this plate has been used as a reference for positioning the structural components that are mounted on it as well as the mechanisms that cross it.
15 In this way, it is sufficient to determine the relative positions of the structural components and these mechanisms with respect to the plate in order to determine their location in the machine, which facilitates the design of the machine and the assembly of the components on the plate. Another advantage is that it is sufficient to process
20 a single plate, for example by cutting openings in the plate or marking the position of the components to be mounted on the plate. Another advantage is that it is sufficient to modify the thickness of the plate for adapting
25 the rigidity that it provides in order to meet the requirements of the other components of the device (e.g. the weight and design of the wrap folder, the accelerations of the lift and the folder, the location of the lift and the wrap folder...).

[0010] Following with DE582371, a cut block of compressed fresh yeast is conveyed on a flat belt to a lifting platform, on which the block is placed. This lifting platform is coupled to a shaft that crosses the plate. As indicated
30 above, traditionally this shaft is coupled to a linear guide. For the reasons mentioned above, this guide is fixed to the plate.
35

[0011] During the lifting of the yeast block, the block remains on the lifting platform. Over the lifting platform there is a tightly wound wrapping paper, so that when
40 the block reaches a certain height during its lifting, a top surface of the block presses the wrapping paper so that part of the paper covers and contacts the top surface of the block, sticking to it. Then, side plates of the wrapping machine press part of the rest of the wrapping paper
45 against the sides of the block, so that these sides are covered by and in contact with the paper. Finally, the wrapping machine folds and presses the wrapping paper to finish wrapping the block. Later, another device can process the already wrapped block, for example, a conveyor belt can transport the block to a container.

[0012] The block of recently extruded fresh yeast has certain peculiarities. It flakes easily, so that fragments are easily detached when the block is subjected to stress.
50 In addition, the dimensions of the yeast block can vary by 5% in all dimensions, which makes it easier for the block to collide or rub against other parts (for example, during transport of the block or while the block is being wrapped). In addition, in order to wrap a high quantity of

blocks of fresh yeast per unit of time, there is a tendency to increase the speed at which both wrapped and unwrapped yeast blocks are transported. For example, the speed at which the block is transported to the lifting platform, the speed at which the block is elevated and the speed at which the block is moved after being elevated are all increased. This results in high accelerations and decelerations of the block (i.e. high inertia forces) and increases the forces to which the block is subjected when it comes into contact with other parts of the wrapping machine.

[0013] All of this causes fragments of the block to be detached during its transportation in the wrapping machine and during the wrapping process until the block is completely wrapped.

[0014] In addition, the accelerations and decelerations of the block of compressed yeast are particularly high in a region adjacent to the lifting platform because the block undergoes a horizontal deceleration just before it arrives at the lifting platform, as it has to change from a high horizontal transportation speed to a null horizontal speed when on the lifting platform, and because the block undergoes a high vertical acceleration, as it has to move from a null vertical speed to an elevation speed. Furthermore, in the final length of the elevation of the block this is subjected to a high deceleration, as the block has to pass from a high vertical speed to a null vertical speed. In addition, the block contacts different parts of the wrapping machine while it is on the lifting platform, which causes stresses in the block that can cause the detachment of yeast fragments from the block. Therefore, a high amount of yeast fragments fall into the portion of the plate 100 that is under the lifting platform and adjacent to the lifting platform.

[0015] In addition, yeast comprises single-unicellular microorganisms that make it susceptible to infection and decay.

[0016] Therefore, it is required to clean, with high frequency, the plate 100, and more particularly the portion of the plate adjacent to the lifting platform, in order to remove the fragments of fresh yeast that have been detached from the blocks of yeast. In addition, it is advantageous to minimize the duration of the cleaning process as well as the cleaning frequency and the surfaces to be cleaned since the wrapping machine must be stopped during the cleaning process.

DESCRIPTION OF THE INVENTION

[0017] For solving the aforementioned drawbacks herein a novel wrapping machine is disclosed. The wrapping machine for wrapping blocks of compressed fresh yeast, the machine comprising a wrap feeder, a wrapping mechanism, a first support placed under the wrapping mechanism, a linear vertical actuator and lifting platform assembly arranged to push a block of yeast upwards against the wrap, it comprises a second support of the wrap feeder, the first support and the second support

being spaced such that a horizontal separation is defined therebetween, a well being arranged below the horizontal separation, the linear vertical actuator being arranged in the well.

[0018] In other words, according to the present invention, it is expected that there will be a discontinuity between the feeding supports on one side and the wrapping train, so that the entrance mouth of a well is defined there, wherein the linear actuator is placed. The linear actuator is arranged so that the yeast debris can fall into the well, that is, the linear actuator is separated from the limits or edges of the support structures.

[0019] This arrangement is very advantageous because the fragments that inevitably come off in the process of first contact (which implies an impact) between the wrapping paper and the yeast fall into a well, the bottom of which is located much lower than a continuous plate that exists in the machines of the state of the technique, like the machine shown in figure 6.

[0020] The advantages of the invention with respect to prior art are clearly appreciable.

[0021] Firstly, the fragments do not fall close to the yeast being wrapped and therefore do not scatter near the components involved in the wrap. Let us remember, as we have indicated in the background section, that fresh yeast is a living being capable of infecting and dirtying.

[0022] Secondly, the fragments are collected in a better defined area, that is, the well. Regardless of the size of the well, this allows for better control of cleanliness.

[0023] Finally, the well allows containers, such as trays to collect the fragments, to be placed at the bottom.

[0024] Although it is true that it is essential to clean the entire machine, with the invention it is possible to clean throughout the day without the need to stop production. This means that when periodical cleaning is carried out thoroughly, it can be done much faster. So it will not only be possible to clean the machine while it is in operation, but also the thorough cleaning can be carried out much faster.

[0025] One effect of the presence of the well is that all the areas to be cleaned are much more accessible. In the areas near the tape that brings the paper and in the area where the wrapping is done, hardly any yeast debris arrive.

[0026] In some embodiments, the first support is a plate. It is an embodiment that has a continuity with the known machines, that is to say that it is not necessary to redesign that side of the machine. Obviously, it can be envisaged that the first support is a set of profiles.

[0027] In some embodiments, the first support and the second support are supported by a common structure. This structure must ensure a stable relative position between the first and second supports.

[0028] One way to implement this common structure is through vertical and horizontal profiles, which is a versatile and inexpensive way to ensure correct positioning between components.

[0029] In some embodiments, the profiles have a square section and having a side comprised between 3 and 7 cm. Preferably, the profiles have a square section and having a side of 5 cm.

[0030] As mentioned, the profiles must ensure that the preset position is maintained between the first and second supports. Remember that one of the advantages of the structures of the state of the art is that the metallic support plate guarantees the correct relative positioning of the components of the wrapping machine. The present invention is in a way to 'cut' this common support. Therefore, for a correct wrapping, it is necessary to give an alternative of stable relative positioning.

[0031] One way to achieve this is through profiles. Now, if you want to increase the speed of the machine, this leads to vibrations and that the lack of correct relative positioning is more likely. To guarantee said positioning, the inventors have found that the claimed section measurements are adequate.

[0032] In some embodiments, the wrapping machine has a well extension that lies under the second support. In this way, the debris that have an oblique path can be directly collected below, without colliding and being hooked on elevated surfaces, which is what would happen if there was a protection plate under the edge of the second support. It is also allowed to spread the debris without reaching the linear actuator by rebound.

[0033] In some embodiments, the wrapping machine comprises a support of the linear the linear vertical actuator, the support having a trapezoidal section such that an upper face thereof is tilted to avoid retaining yeast.

[0034] In this type of machines, for reasons of precision and synchronization, it is common for the actuators to be mechanically actuated by means of mechanical elements driven by a single motor, that is, the wrapping mechanism has a single degree of freedom. This implies having space to house the transmission mechanism of the linear actuator movement, which is this trapezoidal box. The support of the linear the linear vertical actuator is placed such that its upper face channels the yeast towards the well extension.

[0035] Said in other words, the upper inclined face of the trapezoidal box is inclined to channel the fragments to the bottom of the well, thus avoiding their accumulation at higher heights. It is reminded that the lower the fragments end, the farther from the area where it is wrapped and the easier it is to clean them when the machine is operational.

[0036] In some embodiments, an edge of the first support that delimits the well extends downwards by means of a vertical plate that partially encloses the well.

[0037] Finally, the wrapping machine comprises at least a bottom tray for collecting yeast debris.

[0038] The invention also relates to a line of production of wrapped blocks of yeast, wherein the line of production comprises the wrapping machine according to any one of the previous claims and preferably further comprises a cutter for cutting a block of yeast into smaller blocks of

yeast and more preferably further comprises conveying means for conveying blocks of yeast to the lifting platform.

[0039] Additional advantages and features of the invention will become apparent from the detail description that follows and will be particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0040] To complete the description and in order to provide a better understanding of the invention, a set of drawings is provided. Said drawings form an integral part of the description and illustrate embodiments of the invention, which should not be interpreted as restricting the scope of the invention, but just as an example of how the invention can be carried out. The drawings comprise the following figures:

Figure 1 is a side view of the machine according to the invention, showing the relative arrangement of its basic components.

Figure 2 is a view similar to Figure 2 but in perspective.

Figure 3 is a detailed view of a production line in which a cutter, the machine of the invention and a conveyor for transporting the yeast blocks from one station to another appear partially.

Figure 4 shows a preferred embodiment of the well intended to receive the fragments detached from the blocks and the linear actuator arranged therein.

Figure 5 shows a detail of the area in which the vertical thrust of the yeast blocks is carried out for their first packaging phase.

Figure 6 shows a machine of the state of the art.

DETAILED DESCRIPTION OF EMBODIMENTS

[0041] The following description is not to be taken in a limiting sense but is given solely for the purpose of describing the broad principles of the invention. Embodiments of the invention will be described by way of example, with reference to the above-mentioned drawings.

[0042] As shown in the figures, the present invention relates to a machine destined to wrap blocks of compressed fresh yeast.

[0043] On one side, the machine comprises a wrap feeder 2, that provides the paper where the yeast blocks will be wrapped.

[0044] On the other side, the machine comprises a wrapping mechanism 3, which comprises many wrapping stages where the folds are carried on.

[0045] A first support 4 is placed under the wrapping mechanism 3. This support 4 is intended to support part

of the visible components. Others components, like those movable, are linked to the general wrapping mechanism and just pass through the first support 4.

[0046] A linear vertical actuator 10 and lifting platform 6 assembly is arranged to push a block 9 of yeast upwards against the wrap. This first stage of the wrapping is responsible for most part of the fragments.

[0047] The machine comprises a second support 5 of the wrap feeder 2, as shown for example in detail in figure 3.

[0048] According to the present invention, the first support 4 (in the preferred embodiment is a plate 4) and the second support 5 are spaced such that a horizontal separation 7 is defined therebetween. This separation or gap is shown in figure 1. As shown, this gap is large enough for the linear actuator 10 to be some distance from the edges of the first and second supports. In other words, it is not an opening intended to leave a passage just to the moving part of the linear actuator, but rather it is intended to leave space for most of the fragments to fall into the lower trays 83.

[0049] As shown in all the figures, the linear vertical actuator 10 is arranged in the well 8.

[0050] As shown in the figures, the first support 4 and the second support 5 are supported by a common structure, which in a preferred embodiment are vertical and horizontal profiles 12, 13, having a square section and having a side comprised between 3 and 7 cm, and more preferably having a square section and having a side of 5 cm.

[0051] Another feature of the machine consists in a well extension 81 that lies under the second support.

[0052] The machine comprises a support 26 of the linear the linear vertical actuator 10, the support 26 having a trapezoidal section such that an upper face 11 thereof is tilted to avoid retaining yeast.

[0053] As shown in figure 2, an edge 41 of the first support 4 that delimits the well 8 extends downwards by means of a vertical plate 25 that delimits the well 8.

[0054] The machine comprises at least a bottom tray 83 for collecting yeast debris.

[0055] As a conclusion, we can visualize the principal effect of the invention by comparing the yeast fragment storage areas YFSA. In figure 6, which corresponds to a known machine, this area YFSA is just below where the impact occurs between the lifting platform and wrapping paper.

[0056] With the machine of the invention, as shown in figure 4 this area YFSA is brought to a place away from the wrapping area, which also turns out to be a much more affordable and much larger area.

[0057] In summary, the invention allows a fresh yeast packaging line to be maintained in a much cleaner and more hygienic state, and also to reduce cleaning time and therefore improve its productivity.

[0058] As shown in figure 3, the invention relates to a line of production 20 of wrapped blocks of fresh yeast, wherein the line of production 20 comprises the wrapping

machine 1 according to any one of the previous variants and preferably further comprises a cutter 21 for cutting the extruded yeast bar into smaller blocks of yeast and more preferably further comprises conveying means 22 for conveying blocks of yeast to the lifting platform 6.

[0059] Going back to figures 1 and 2, both figures show a block of yeast on a platform 6 extending in a horizontal direction. The platform 6 is joined to a linear vertical actuator 10 which may comprise a double acting cylinder 14 for moving the platform 6 up and down.

[0060] Figures 1, 2 and 4 show that the support 26 of the linear vertical actuator 10 may be supported on a horizontal profile 12. In addition, the support 26 may also be attached to a supporting profile extending in a vertical direction. As shown in the figures, preferably these profiles are part of the common structure supporting the first support 4 and the second support 5.

[0061] As shown in figures 2 and 4, the bottom of the well 8 is at a lower height than the lowest portion of the vertical actuator 10 and, preferably, at a lower height than the lowest portion of the support 26 of the vertical linear actuator 10.

[0062] As shown in figures 1 to 5, the wrap feeder 2 is spaced from the support 26 of the linear vertical actuator 10, such that there is a free vertical space between them through which yeast debris, coming from yeast block 9 while being lifted, can fall.

[0063] As shown in figure 3, the conveying means 22 convey yeast blocks 9 to the platform 6 and hence end adjacent to the platform 6, thus entering the well 8.

[0064] It stands out that in the context of the line, the bottleneck, for the reasons explained above, lies in the wrapping machine or station, and precisely in the area where the piston is located, whose modification is precisely the object of the present invention.

[0065] In this text, the term "comprises" and its derivations (such as "comprising", etc.) should not be understood in an excluding sense, that is, these terms should not be interpreted as excluding the possibility that what is described and defined may include further elements, steps, etc.

[0066] On the other hand, the invention is obviously not limited to the specific embodiment(s) described herein, but also encompasses any variations that may be considered by any person skilled in the art (for example, as regards the choice of materials, dimensions, components, configuration, etc.), within the general scope of the invention as defined in the claims.

Claims

1. Wrapping machine (1) for wrapping blocks (9) of compressed fresh yeast, the machine (1) comprising a wrap feeder (2), a wrapping mechanism (3), a first support (4) placed under the wrapping mechanism (3), a linear vertical actuator (10) and lifting platform (6) assembly arranged to push a block (9) of yeast

upwards against the wrap, it comprises a second support (5) of the wrap feeder (2), the first support (4) and the second support (5) being spaced such that a horizontal separation (7) is defined therebetween, **characterised in that** a well (8) is arranged below the horizontal separation (7), the linear vertical actuator (10) being arranged in the well (8) such that fragments of yeast can fall into the well (8).

cutter (21) for cutting a block of yeast into smaller blocks of yeast and more preferably further comprises conveying means (22) for conveying blocks of yeast to the lifting platform (6).

2. Wrapping machine (1) according to claim 1, wherein the first support (4) is a plate. 10
3. Wrapping machine (1) according to any one of the previous claims, wherein the first support (4) and the second support (5) are supported by a common structure. 15
4. Wrapping machine (1) according to claim 3, wherein the common structure is made of vertical and horizontal profiles (12, 13). 20
5. Wrapping machine (1) according to claim 4, the profiles (12, 13) having a square section and having a side comprised between 3 and 7 cm. 25
6. Wrapping machine (1) according to claim 5, the profiles (12, 13) having a square section and having a side of 5 cm.
7. Wrapping machine according to any of the previous claims, wherein the well (8) has a well extension (81) that lies under the second support (5). 30
8. Wrapping machine according to any one of the previous claims, which comprises a support (11) of the linear the linear vertical actuator (10), the support (26) having a trapezoidal section such that an upper face (11a) thereof is tilted to avoid retaining yeast. 35
9. Wrapping machine according to claims 7 and 8, wherein the support (26) of the linear the linear vertical actuator (10) is placed such that its upper face (11a) channels the yeast towards the well extension (81). 40
10. Wrapping machine according to claim 1, wherein an edge of the first support (4) that delimits the well (8) extends downwards by means of a vertical plate (25) that delimits the well (8). 45
11. Wrapping machine (1) according to any one of the previous claims, comprising at least a bottom tray (83) for collecting yeast debris. 50
12. A line of production (20) of wrapped blocks of yeast, wherein the line of production (20) comprises the wrapping machine (1) according to any one of the previous claims and preferably further comprises a 55

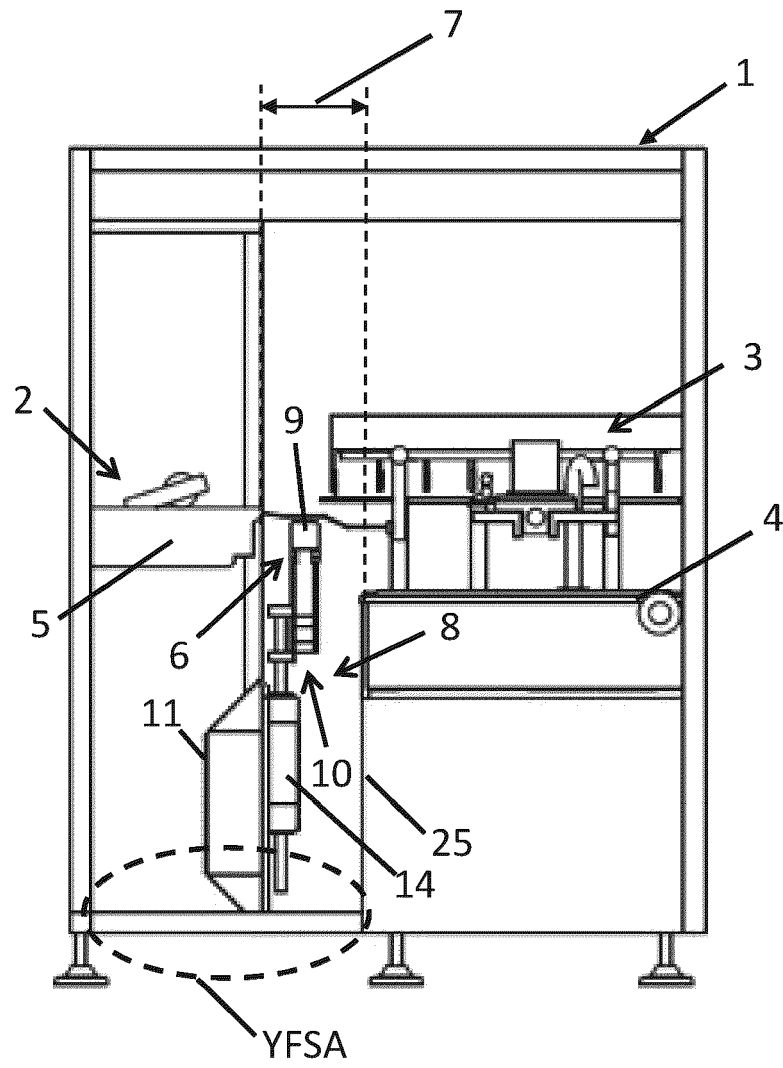


FIG. 1

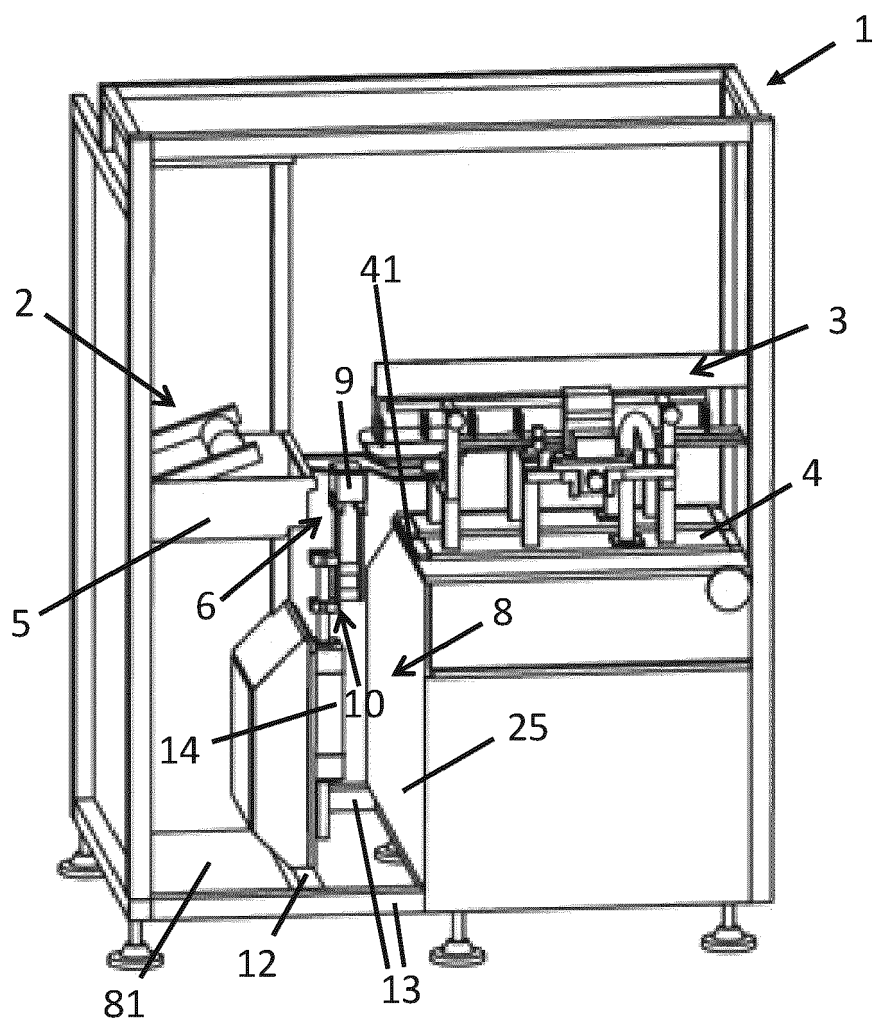


FIG. 2

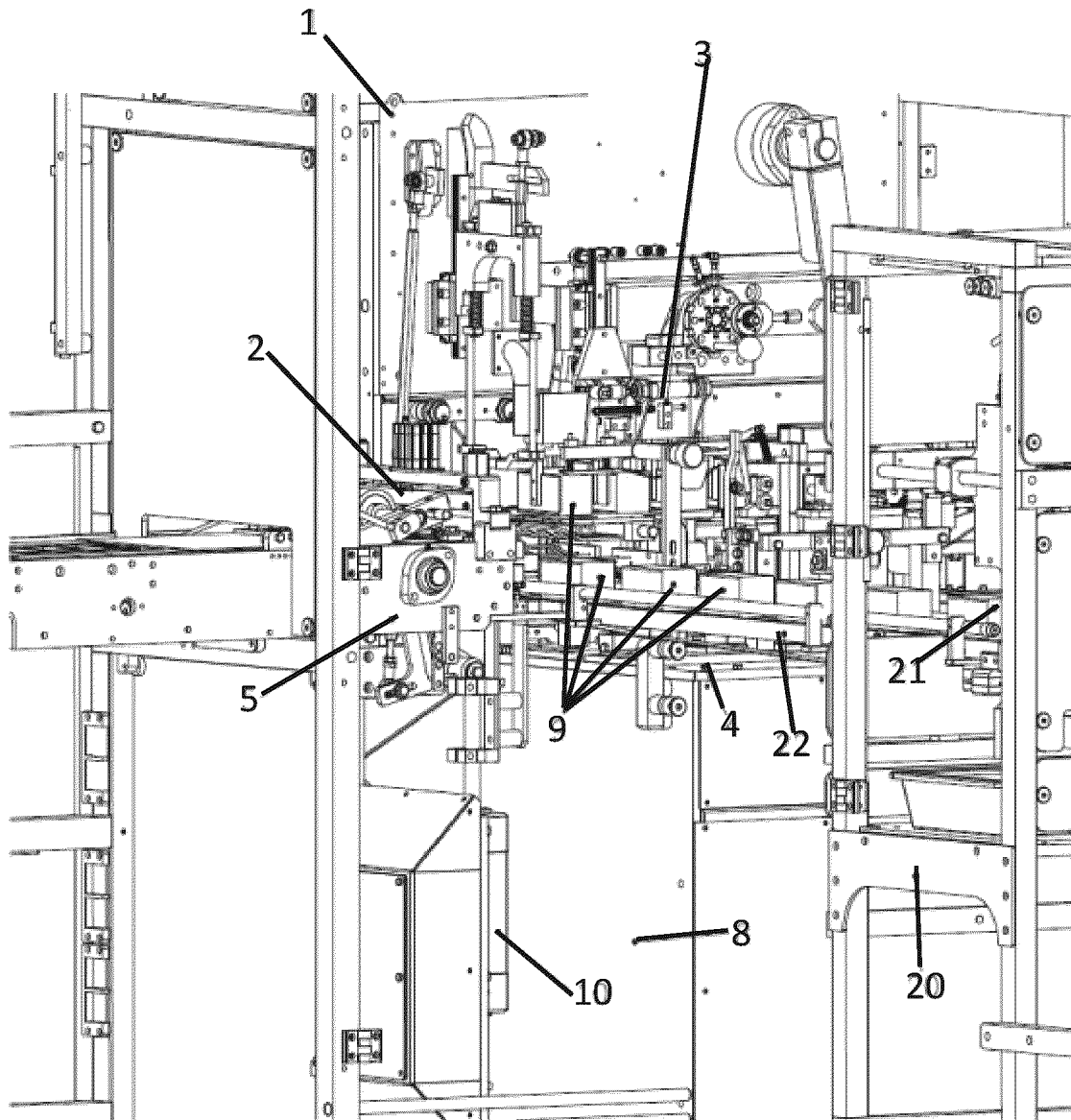


FIG. 3

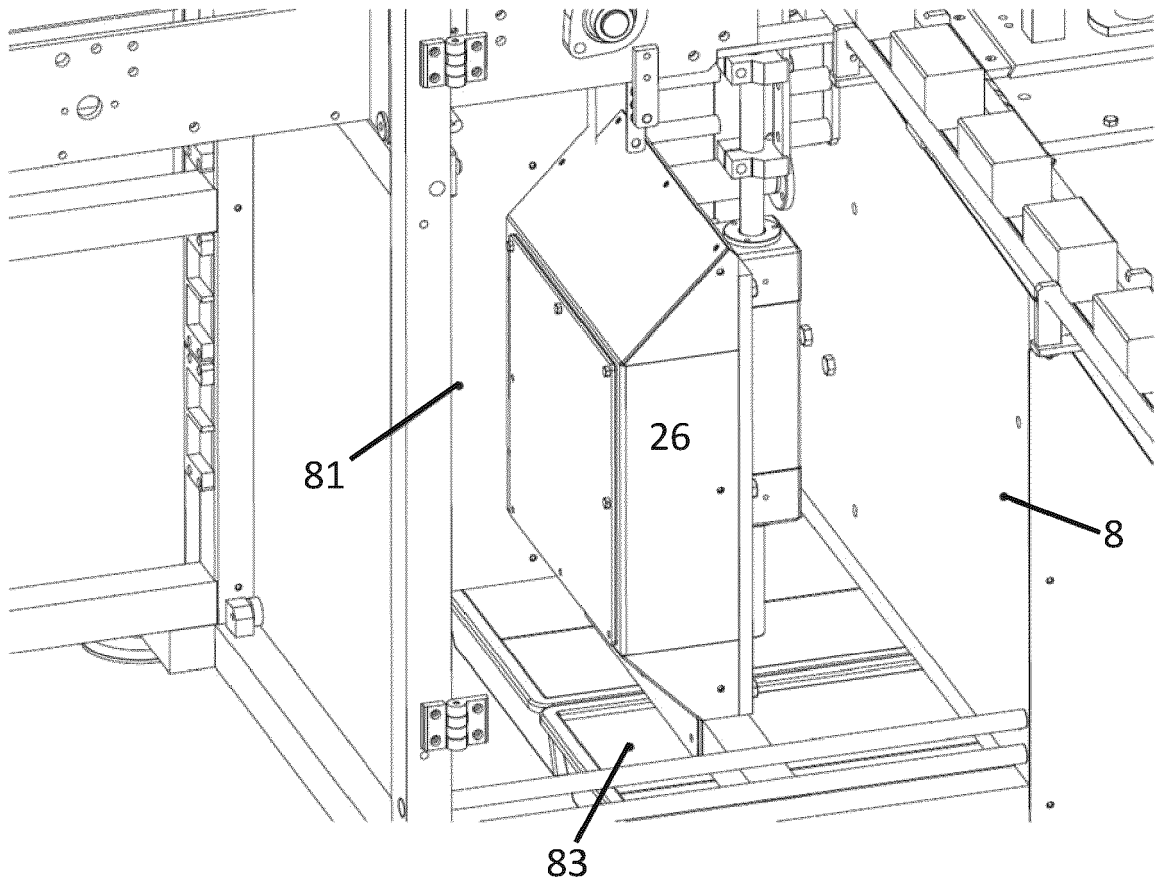


FIG. 4

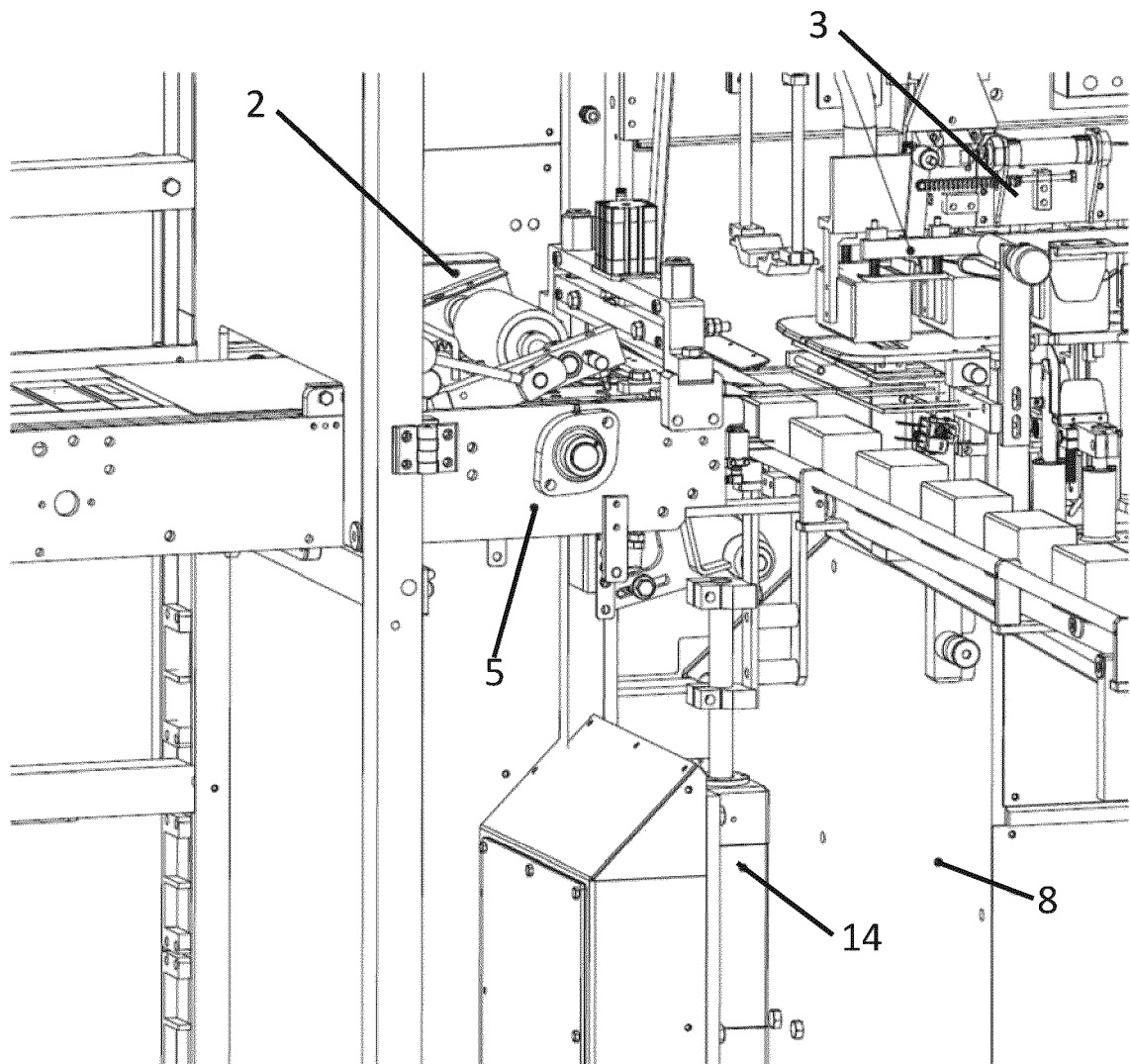


FIG. 5

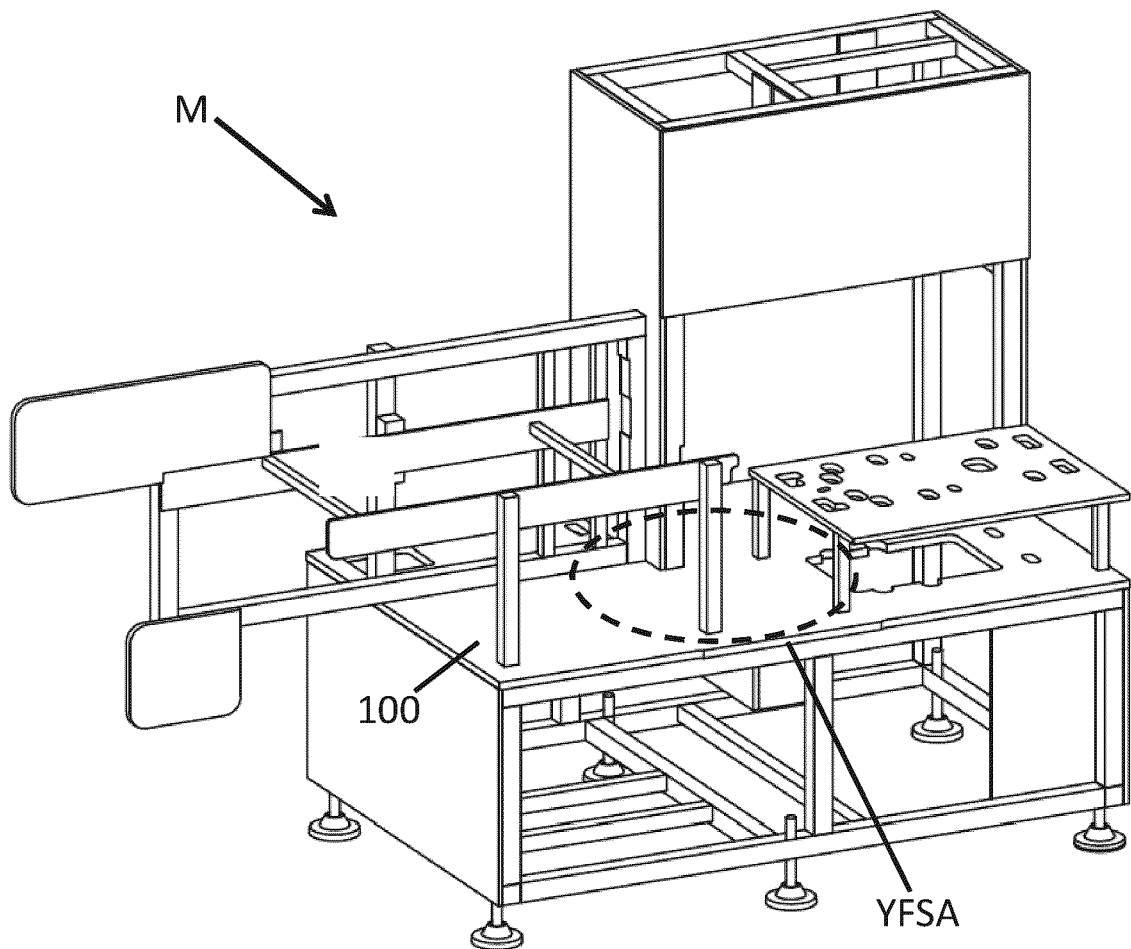


FIG. 6



EUROPEAN SEARCH REPORT

Application Number
EP 20 38 2521

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	DE 582 371 C (GERRIT DWARS) 14 August 1933 (1933-08-14) * the whole document *	1-12	INV. B65B25/16 B65B11/48
A	DE 288 555 C (WILHELM HILGERS) 6 November 1915 (1915-11-06) * the whole document *	1-12	
A	US 1 653 880 A (SMITH ELMER L ET AL) 27 December 1927 (1927-12-27) * the whole document *	1-12	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 4 November 2020	Examiner Ngo Si Xuyen, G
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 582371	C	14-08-1933	NONE
DE 288555	C	06-11-1915	NONE
US 1653880	A	27-12-1927	NONE

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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