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References cited:

A WRAPPING DEVICE WITH A CIRCULAR TRACK STRUCTURE, AND A FILM FEEDING DEVICE
EINWICKELVORRICHTUNG MIT KREISFÖRMIGER BAHNSTRUKTUR UND
FOLIENZUFÜHRVORRICHTUNG
ENVELOPPEUSE A PISTE CIRCULAIRE ET DISPOSITIF D’ALIMENTATION EN FILM

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Description

Field of the Invention

[0001] The invention relates to a wrapping device as defined in the preamble of claim 1. The invention also relates to a film feeding device for a wrapping device as defined in the preamble of claim 12.

Background of the Invention

[0002] For the wrapping of various pieces, for example coils, wrapping devices known as such are used to perform the wrapping by means of a wrapping film, preferably a thin and transparent stretch film made of plastic. The film roll is normally fitted in film feeding means, which are further placed in a carriage which moves along a circular structure and a track formed therein, either around the whole piece or passing via an opening in the central line of the piece.

[0003] However, such devices have the problem that the quantity of film to be supplied from the film roll at each moment varies at different locations on the circular tract, because the carriage is not continuously at the same distance from the piece. At some points, the distance is even reduced, having the result that the film between the piece and the carriage does not remain sufficiently stretched all the time, thereby leading to poor wrapping quality, causing tangling of the film or other problems.

[0004] One wrapping device is disclosed in EP 0 936 142 A2, or corresponding US patent 6,192,653. The device comprises a roll device for guiding a film, having a roll placed against the film to maintain the tension of the film but being still allowed to rotate with the film in the feeding direction of the film. The roll is coupled by means of a moment limiter to a motor device which tends to rotate the roll in the opposite direction, but the tension of the film exceeds the set moment and the roll can thus not rotate in the opposite direction. If the film is slackened, the roll can rotate in the opposite direction and the film is re-wound on the film roll, wherein said problem is eliminated. However, problems may be involved in the synchronization of the operation of the guide roll and the film roll, because the film roll may also be provided with a moment limiter.

[0005] Another device is presented in EP 0 936 141 B1, in which the tension of the film is continuously monitored with sensor means and in which the film roll can be rotated by means of a motor. If the film is found to become slackened, the film roll is rotated backwards and the loose part is rewound on the film roll. The device requires an auxiliary motor for the film roll, which is difficult to place in the carriage and which considerably increases the weight of the carriage.

[0006] One known device is presented in the publication EP 0 544 312 B1, or corresponding US patent 5,282,347. The device comprises a roll device placed in a carriage and in which the loose film can be accumulat-

ed, if necessary. Some of the rolls are moved by spring force and controlled by changes in the tension of the film. The rolls require a lot of space and increase the weight of the carriage. An increase in the weight will make the moving of the carriage more difficult or will involve an increased power requirement and problems in the placement of the powerful motors.

Summary of the Invention

[0007] It is an aim of the invention to provide a wrapping device as an alternative and an improvement to the disadvantages of prior art. By means of the invention, it is possible to rewind loose film without applying electrical sensors and auxiliary motors and to avoid such structures in the carriage which are coupled to the means for moving the carriage forward, wherein the structure becomes simpler and the design of the different parts can be kept separate.

[0008] The wrapping device according to the invention is characterized in what will be presented in the characterizing part of claim 1. The film feeding device according to the invention is characterized in what will be presented in the characterizing part of claim 12.

[0009] By means of the invention, it is easier to design the carriage and to use alternative or even totally new types of structures, because the structures taking care of the loose film do not necessarily need to cooperate, for example, with the motor for moving the carriage or with the transmission mechanisms. Replaceability is increased and the maintenance and the replacement of parts become easier.

Brief Description of the Drawings

[0010] In the following description, the invention will be described in more detail by using, as an example, an advantageous embodiment of the invention with reference to the appended drawings, in which

Fig. 1 shows a film feeding device seen from the side and coupled to the track structure of the wrapping device, as well as the operation of the device when the tension of the film is simultaneously predetermined or higher than that,

Fig. 2 shows the film feeding device seen from the side and coupled to the track structure of the wrapping device, as well as the operation of the device when the tension of the film is simultaneously lower than the predetermined value,

Fig. 3 shows guide wheels of the mechanism seen in the direction of the track structure.

Detailed Description of the Invention

[0011] Figures 1 and 2 show the principle of operation
of the film feeding device 1, and in this description, the device 1 will also be called a carriage and the feeding means 10, 12, 13, 14, 15 will also be called guide rolls. The carriage 1 and the guide rolls are shown in a reduced schematic view to illustrate the operation. Figure 1 shows a situation in which the film 9 to be fed is suitably tensioned, wherein the tension of the film is predetermined or higher than that, and it is fed from a film roll 8 forward and further around a piece to be wrapped. The end of the film 9 is attached to the piece, wherein when the carriage 1 moves, the film 9 is simultaneously tightened by the effect of the guide rolls and is unwound from the film roll 8. Figure 2 shows a situation in which the film 9 has been slackened and it is rewound around the film roll 8.

[0012] The carriage 1 comprises a frame structure 2 in which the functional parts are coupled. The presented carriage 1 is shown without a motor or means by whose force effect the carriage 1 is moved along the track structure 3 and following a desired path. The motors, or the means 26 moving the carriage forward, can be implemented by means known as such, wherein the frame 2 is provided, for example, with an electrical motor to rotate, for example, a cogged wheel which is placed against a cogging on the track 3. By means of the cogged wheel, the carriage 1 is driven forward, and simultaneously the necessary electrification is provided by means of sliding connections, wherein the carriage 1 is provided with contacts and the track 3 is provided with an electrified conductor track, along which the contacts of the carriage slide. The track 3 is a circular track forming an endless path along which the carriage 1 travels. The track 3 has, for example, such a shape that it comprises two horizontal track parts which are on top of each other and which are connected by means of vertical arch-like track parts, wherein during a cycle, the carriage 1 rotates around a direction which is horizontal and transverse to the plane in which the carriage 1 moves. The carriage 1 is supported to the track 3 by means of upper wheels 4 and 5 and lower wheels 6 and 7, carrying the carriage 1 in its different positions. The wheels are placed on opposite sides of the track structure 3. The track 3 is, for example, a flat plate structure supported or connected to the frame.

[0013] The carriage 1 is provided with a film roll 8 from which the film 9 is fed and guided by guiding rolls off the carriage 1 and further around the piece to be wrapped, which is placed inside the circular track or through which the carriage 1 and the track 3 are placed to pass. In this case, particularly coils made of a metal band, having a large inner opening, are feasible. If necessary, the track is provided with a port which can be opened or a movable part to insert the track 3 in the piece and to form a continuous track for the carriage 1. Furthermore, a rotating device is placed under the track structure 3 to rotate the coils during the wrapping, wherein each part of the coil can be wrapped. The rotating axis of the coil is its longitudinal axis which is placed in parallel with the track.

[0014] The guide rolls are used to keep the film 9 suitably tensioned by braking and to take care of the pre-tensioning and guiding of the film. In the shown embodiment, the guide rolls also comprise a cam roll 10 whose position depends on the tension of the film 9. Thus, the cam roll 10 is a means which detects the tension of the film and whose position is dependent on the tension. The cam roll 10 is coupled to a rotatable lever 11 whose other end is connected to the rotation axis of the roll 12 or in another fixed position. The roll 12 is freely rotatable. The guide rolls also comprise a free roll 15 which guides the film 9 unwound from the film roll 8. Rolls 13 and 14 are provided between the rolls 12 and 15. The roll 13 cooperates with the braking roll 14, because they are coupled to each other by a transmission, wherein they rotate in synchronization with each other. The transmission is preferably implemented by means of caged wheels placed at the ends of the rolls, around the shaft. The locations of the rolls 12, 13, 14 and 15, as well as of the film roll are fixed in relation to each other.

[0015] The carriage 1 also comprises a drive roll 16 which is not in contact with the track 3 when the film 9 is tensioned. The drive roll 16 and the film roll 8 are coupled to each other by means of a fixed transmission 17, 18, 19, wherein they rotate in synchronization and in the same direction. The gearing of the transmission is preferably implemented by means of a caged belt 17 and caged belt pulleys 18 and 19. In this case, the transmission is fixed, wherein the drive mechanism is also arranged to rotate with the film roll 8 in the direction in which the film is fed from the film roll 8 when the tension of the film is predetermined or higher than that. In the situation of Fig. 1, the force effect rotating the roll 16 is obtained from the film roll 8 which, in turn, is rotated by the tensioned film 9 being unwound. The tensioned film 9 keeps, by means of its force effect, the drive roll 16 off the track 3, which is implemented by means of a lever 20 in such a way that also the drive roll 16 is coupled to the lever 20. The lever 20, in turn, is coupled to the lever 11 or the cam roll 10 in such a way that a movement of the the cam roll 10 will also affect the position of the lever 20. The drive roll 16 is coupled to the film roll 8 in such a way that the drive roll 16 can be turned in relation to the film roll 8 and away from the track 3 when the lever 20 tends to move the drive roll 16. The rotation is made possible by means of a lever 21 which is coupled between the shafts of the drive roll 16 and the film roll 8. The cam roll 10 and the levers 11 and 20 constitute a mechanism which controls the drive roll 16 and thereby the connection and disconnection of the drive mechanism to the source of the driving force.

[0016] The drive roll 16, the spring 22, and the parts 17, 18 and 19 of the gearing constitute the drive mechanism which rotates the film roll 8 and receives its driving force via a mechanical contact 26. In this case, the contact is the contact of the rolling driving roll 16 along the stationary track 3, wherein frictional forces rotate the drive roll 16 which is pushed by the spring 22 against the surface of the track 3. If the force effect of the tension of the film is greater, it will overcome the effect of the spring
22, and the drive roll is pulled off the track, wherein the contact is disengaged. In this case, it should be noted that the driving force is only generated when the carriage 1 is in motion, wherein the source of the driving force is the movement between the carriage 1 and the circular track structure 3. Alternatively, the mechanical contact 26 can also be formed by a circular crawler track placed against the track 3. Furthermore, the track 3 may be provided with pins or other protrusions placed at regular intervals, which hit corresponding means in the drive mechanism of the carriage 1 and thereby move or rotate the drive mechanism and the film roll backwards, for example stepwise. The tensioned film 9 moves the drive mechanism in such a way that it will no longer hit the protrusions but the slack film 9 will allow the contact. In Fig. 2, the contact is continuous, but it may also be sectional or periodic, as presented above in connection with the protrusions. The aim is to rotate the film roll 8 backwards.

The force effect of the slack film 9 is not sufficient to resist the force effect of the spring 22, wherein the spring 22 presses the drive roll 16 against the track 3, as shown in Fig. 2. Instead of the spring 22, it is also possible to apply gas springs or other means which provide a suitable counterforce and which are preferably adjustable. Furthermore, the slack film 9 must be rewound onto the film roll 8, which is implemented by providing the force effect to rotate the film roll 8 from the drive roll 16, which is now pressed against the track 3 and tends to roll along it. The carriage 1 is driven along the track 3, which also causes the rotation of the roll 16. In comparison with the situation of Fig. 1, the rotating direction of the drive roll 16 is reversed, wherein the rotating direction of the film roll 8 is simultaneously reversed and the loose film 9 is now rewound onto the film roll 8.

The surface of the drive roll 16 or the track 3 or them both can be roughened or provided with a suitable embossing to prevent the sliding or slipping of the drive roll 16. Thus, the track 3 can also be equipped with a cogging, against which the corresponding cogging of the drive roll 16 is placed. The track 3 or the drive roll 16 may also be coated with a suitable material, such as rubber, to achieve higher friction in the contact 26.

The film roll 8 is mounted on its rotation axis preferably in such a way that the film roll which has become empty can be easily replaced with a new, full film roll. The distance between the rolls 13 and 14 can be preferably set to enable controllability. The spring 22 or the corresponding gas spring can also be installed in such a way that they tend to push the lever 21 or the drive roll 16 towards the track 3. In Fig. 1, the spring 22 is coupled in such a way that it tends to pull the lever 21 and the drive roll 16 towards the track 3. In one embodiment, the frame 2 comprises two parallel plates between which the guide rolls 12, 13, 14 and 15 are mounted on bearings at each end. Between the plates, there may be connecting structures to support and reinforce the structure. Thus, when looking at Fig. 1, the front plate is removed and only the back plate is exposed. The lever 20 is preferably placed outside the front plate, and the front plate is provided with a groove in which the shaft of the roll 16 can move. The shaft supporting the film roll 8 is, in turn, mounted on bearings in only one of the plates, wherein the opposite plate is provided with an opening, through which the film roll 8 can be replaced. Consequently, the carriage 1 is provided with means which enable the fixing of the film roll 8 in the carriage in a replaceable and rotatable manner. The length of the rolls 10, 12, 13, 14, and 15 corresponds to the width of the film 9 or is greater than that. The drive roll 16 is narrow, and only one end of its shaft journal 25, shown in Fig. 3, is mounted on bearings in the lever 21.

In one embodiment, the number of upper and lower wheels totals eight, wherein they are placed close to each edge of the track 3 and on opposite sides of the track 3. In the presented embodiment, the width of the track 3 corresponds substantially to the width of the carriage 1. Each plate is provided with four wheels, and the lower wheels are connected to the frame 2 by means of such structures which extend around the edges of the track 3. The mounting of the rolls and wheels on bearings and their installation are implemented by utilizing mechanical components which are known as such and whose application in the principle of the carriage 1 of Figs. 1, 2 and 3 will be obvious on the basis of this description for a person skilled in the art. The adjustment of the force effect of the spring 22 and the other functions can be easily implemented and may also be based on pure experimentation and the selection of a suitable component.

Figure 3 shows, in a detail, the drive roll 16 and the guide roll 23 alone when they are pushed towards the track 3 in a location where the track 3 is also provided with an elevation 24. In this case, the elevation 3 forms a guide profile along which the guide roll 23 rolls and forces the drive roll 16 off the track 3. In this way, the guide roll 23 disconnects the contact 26 shown in Fig. 2 and forces the drive roll 16 to move. In the figure, the rolls 16 and 23 are seen from the direction of the track 3 and the movement of the carriage 1, in other words seen from the right when compared with Fig. 1 or 2.

The drive roll 16 can now be forced off the track 3, which makes it possible to guide and time the rewinding in a more precise manner. For this purpose, a freely rotating roll 23 is placed on the same shaft as the drive roll 16, wherein if its diameter corresponds to that of the drive roll 16, it will also roll along the track 3, or is smaller, wherein it will not be placed against the flat track 3. The drive mechanism does not receive its driving force via the guide roll 23. Now, the track 3 can be provided, at a desired location, with a guide profile 24 by the guide roll 23, wherein the guide roll 23 can be used to force the drive roll 16 off the track by raising it, wherein the film roll 8 is not rotated backwards. This situation corresponds to the situation of Fig. 1, but it can now be provided by active measures, with the help of the elevation 24, by using forced control. The guide roll 23 connected to the
shaft 25 constitutes a mechanism which guides the drive roll 16 and thereby the connection and disconnection of the drive mechanism to the source of the driving force. The guide roll 23 may also be coupled to the lever 21, wherein the lever 21, in turn, moves the drive roll 16. If the geometry and the force effect of the guide roll 23 are directed in a suitable way, the guide roll 23 may also be coupled to the lever 20 which lifts the drive roll 16 off the track 3. The drive roll 16 can also be placed underneath the track 3, wherein the directions of motion of the levers must be arranged to correspond to this situation. Similarly, the guide roll 23 can be on opposite side of the track 3, wherein the guide roll 23 must be arranged to move the drive roll 16 in a corresponding manner. The elevation 24 can also be constructed as a separate track structure which is parallel to the track 3 and which is followed by the guide roll 23. Said track may be continuous or may be placed only in a section of the track 3, which is also typical with the elevation, because forced guidance is only needed at desired points. Preferably, the location of the guide profile 24 is adjustable or its length can be changed by means of, for example, extension pieces.

If the behaviour of the film 9 is well known in advance, or if pieces of very constant shapes are wrapped, the slackening of the film can be estimated already beforehand and thereby those points of the track in which rewinding will be needed are known in advance. In a simple embodiment of the invention, the drive mechanism receives its control from the guide profile 24 alone, wherein the movement of the cam roll 10 or the lever 20 are unnecessary. In the embodiment shown in Figs. 1, 2 and 3, both the guide profile 24 and the moving cam roll 10 are used. The guide profile 24 will not be compulsory, if forced guidance is not necessary or if the operation of the cam roll 10 is sufficiently accurate.

The position of the drive roll 16 can also be set by means of a mechanism formed by electrical actuators, wherein the actuators, controlled by the movement of the cam roll 10, pull the drive roll 16 off the track 3, if necessary. The position of the cam roll 10 is used as a tension indicator and couples the actuator to operation in a rotating or linear movement. For this purpose, the frame 2 must be equipped with actuators and it must be provided with electrification for sensors and/or actuators. In this case, sliding contacts, known as such, are applied, which slide along a guide mounted on the track 3. The tension indicator may also be the guide profile 24 alone, which guides the actuator by means of the guide roll 23 and the sensor. In these embodiments, the carriage 1 must be equipped with electrification, wherein all the advantages of a simple, purely mechanical system will not be achieved. A more complex system is also represented by an embodiment of the invention, in which sensors are used in the carriage 1 to find out its location on the track 3, and the position of the drive roll 16 is controlled according to the location. For example, the sensor detects mechanically, optically or electrically marks which are fixed on the track 3 and are preferably movable to cause the release or return of the drive roll 16 in an alternating manner.

Claims

1. A wrapping device comprising at least a circular track structure (3) which forms a closed track, and a film feeding device (1) which is arranged to circulate along said track and to feed a film (9) around a piece to be wrapped, wherein the film feeding device (1) is provided with at least

- means for fixing a film roll (8) in the film feeding device (1) in a rotating manner,
- feeding means (12, 13, 14, 15), through which the film (9) is arranged to be fed at a predetermined film tension, and
- a drive mechanism (16, 17, 18, 19, 22) which is arranged, if necessary, to rotate the film roll (8) in a direction, in which the film (9) is rewound on the film roll (8) and which is arranged to receive its driving force by means of a mechanical contact (26) between the drive mechanism (16, 17, 18, 19, 22) and the circular track structure (3),

characterized in that the film feeding device (1) also comprises

- a mechanism (10, 11, 20, 23) which is arranged to disconnect and reconnect said contact, wherein said mechanism is controlled either on the basis of the film tension or on the basis of the location of the film feeding device (1) on said track, or on the basis of them both.

2. The wrapping device according to claim 1, characterized in that said mechanism is arranged to disconnect said contact when the film tension is predetermined or higher than that, and to reconnect said contact when the film tension is lower than the predetermined value.

3. The wrapping device according to claim 1 or 2, characterized in that said mechanism is arranged to
receive its control from a guide profile (24) which is in the circular track structure (3) and placed on at least a section of said track.

4. The wrapping device according to any of the claims 1 to 3, characterized in that said mechanism is provided with at least one wheel (23) rolling along the circular track structure, on the basis of whose position said mechanism is controlled.

5. The wrapping device according to any of the claims 1 to 4, characterized in that said drive mechanism comprises at least one wheel (16) rolling along the circular track structure (3), which can be moved off the circular track structure (3) and back, by means of said mechanism.

6. The wrapping device according to any of the claims 1 to 5, characterized in that said drive mechanism is arranged to allow the rotation of the film roll (8) in a direction in which the film (9) is fed around the piece to be wrapped, when the tension of the film is predetermined or higher than that.

7. The wrapping device according to any of the claims 1 to 6, characterized in that said drive mechanism is separate in relation to the drive mechanism which, in turn, is arranged to drive the film feeding device (1) along said track.

8. The wrapping device according to any of the claims 1 to 7, characterized in that the source of driving force for said drive mechanism is the mutual movement between the film feeding device (1) and the circular track structure (3), which, via said contact, is simultaneously arranged to maintain the operation of the drive mechanism.

9. The wrapping device according to any of the claims 1 to 8, characterized in that said mechanism comprises a set of levers (20), to which the drive mechanism (16, 17, 18, 19, 22) is coupled and whose position is arranged to be controlled by the force effect which is dependent on the tension of the film.

10. The wrapping device according to any of the claims 1 to 9, characterized in that said mechanism comprises means (10) for detecting the tension of the film.

11. The wrapping device according to claim 10, characterized in that the means (10) for detecting the tension of the film comprise a cam roll (10) which is placed against the film (9) and whose position is dependent on the force effect of the film tension.

12. A film feeding device for a wrapping device, wherein the film feeding device (1) comprises at least

- means for fixing a film roll (8) in the film feeding device (1) in a rotating manner,
- feeding means (12, 13, 14, 15), through which the film (9) is arranged to be fed at a predetermined film tension around a piece to wrapped, and
- a drive mechanism (16, 17, 18, 19, 22) which is arranged, if necessary, to rotate the film roll (8) in a direction, in which the film (9) is rewound on the film roll (8) and which is arranged to receive its driving force by means of a mechanical contact (26) which is between the drive mechanism (16, 17, 18, 19, 22) and the circular track structure (3), when the film feeding device (1) is further arranged in the wrapping device and is arranged to move along a track arranged in the wrapping device,

characterized in that the film feeding device (1) also comprises

- a mechanism (10, 11, 20, 23) which is arranged to disconnect and reconnect said contact, wherein said mechanism is controlled either on the basis of the film tension or on the basis of the location of the film feeding device (1) on said track, or on the basis of them both.

13. The film feeding device according to claim 12, characterized in that said mechanism comprises means (10) for detecting the tension of the film.

14. The film feeding device according to claim 12 or 13, characterized in that said mechanism is arranged to receive its control from the circular track structure.

Patentansprüche

1. Einwickelvorrichtung mit zumindest einer umlaufenden Bahnstruktur (3), die eine geschlossene Bahn bildet, und einer Folien-Zuführvorrichtung (1), die angeordnet ist, um entlang der Bahn umzulaufen und um eine Folie (9) um einzwickelndes Stück zu legen, wobei die Folien-Zuführvorrichtung (1) zumindest das Folgende umfasst:

- Mittel zum rotierenden Fixieren einer Folien-Rolle (8) in der Folien-Zuführvorrichtung (1),
- Zuführmittel (12, 13, 14, 15), durch die die Folie (9) mit einer vorbestimmten Folienspannung zuführbar ist, und
- einen Antriebsmechanismus (16, 17, 18, 19, 22), der angeordnet ist, um, sofern notwendig, die Folien-Rolle (8) in eine Richtung zu drehen, in der die Folie (9) wieder auf die Folien-Rolle (8) aufgewickelt wird, und der angeordnet ist, um seine Antriebskraft durch einen mechani-
Einwickelvorrichtung nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** die Quelle der Antriebskraft für den Antriebsmechanismus die gegenseitige Bewegung zwischen der Folien-Zuführvorrichtung (1) und der umlaufenden Bahnstruktur (3) aufrecht zu erhalten.

8. Einwickelvorrichtung nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** die Quelle der Antriebskraft für den Antriebsmechanismus die gegenseitige Bewegung zwischen der Folien-Zuführvorrichtung (1) und der umlaufenden Bahnstruktur (3), die mittels diesem Kontakt gleichzeitig angeordnet ist, um den Betrieb des Antriebsmechanismus aufrecht zu erhalten.

9. Einwickelvorrichtung nach einem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** der Antriebsmechanismus einen Satz Hebel (20) umfasst, mit denen der Antriebsmechanismus (16, 17, 18, 19, 22) gekoppelt ist und deren Position angeordnet ist, um durch den Krafteffekt, der von der Spannung der Folie abhängt, gesteuert bzw. geregelt zu werden.

10. Einwickelvorrichtung nach einem der Ansprüche 1 bis 9, **dadurch gekennzeichnet, dass** der Antriebsmechanismus Mittel (10) zum Erfassen der Spannung der Folie umfasst.

11. Einwickelvorrichtung nach Anspruch 10, **dadurch gekennzeichnet, dass** das Mittel (10) zum Erfassen der Spannung der Folie eine Nockenrolle (10) umfasst, die an die Folie (9) anliegend angeordnet ist und deren Position von dem Krafteffekt der Folien-Spannung abhängt.

12. Folien-Zuführvorrichtung für eine Einwickelvorrichtung, wobei die Folien-Zuführvorrichtung (1) zumindest das Folgende umfasst:
   - Mittel zum rotieren Fixieren einer Folien-Rolle (8) in der Folien-Zuführvorrichtung (1).
   - Zuführmittel (12, 13, 14, 15) durch die die Folie (9) mit einer vorbestimmten Folien-Spannung zuführbare ist, und
   - einen Antriebsmechanismus (16, 17, 18, 19, 22), der angeordnet ist, um, sofern notwendig, die Folien-Rolle (8) in eine Richtung zu drehen, in der die Folie (9) wieder auf die Folien-Rolle (8) aufgewickelt wird, und der angeordnet ist, um seine Antriebskraft durch einen mechanischen Kontakt (26) zwischen dem Antriebsmechanismus (16, 17, 18, 19, 22) und der umlaufenden Bahnstruktur (3) zu erhalten, wobei die Folien-Zuführvorrichtung (1) des Weiteren in der Einwickelvorrichtung angeordnet ist und angeordnet ist, um sich entlang einer Bahn zu bewegen, die in der Einwickelvorrichtung vorgesehen ist,
   - Mittel zum rotieren Fixieren einer Folien-Rolle (8) in der Folien-Zuführvorrichtung (1).
   - Zuführmittel (12, 13, 14, 15) durch die die Folie (9) mit einer vorbestimmten Folien-Spannung zuführbare ist, und
- einen Mechanismus (10, 11, 20, 23) umfasst, der angeordnet ist, um den Kontakt zu öffnen und wieder zu schließen, wobei der Mechanismus entweder auf Basis der Folien-Spannung oder auf Basis des Ortes der Folien-Zuführungrichtung (1) auf der Bahn oder auf Basis von beiden zu regeln bzw. zu steuern.

13. Folien-Zuführungrichtung nach Anspruch 12, dadurch gekennzeichnet, dass der Mechanismus Mittel (10) zum Erfassen der Spannung der Folie umfasst.


Revisions

1. Enveloppeuse comprenant au moins une structure de piste circulaire (3) qui forme une piste fermée, et un dispositif d’alimentation de film (1) qui est agencé pour circuler le long de ladite piste et pour alimenter un film (9) autour d’une pièce à envelopper, dans laquelle le dispositif d’alimentation de film (1) est prévu avec au moins :

- des moyens pour fixer un rouleau de film (8) dans le dispositif d’alimentation de film (1) d’une manière rotative,
- des moyens d’alimentation (12, 13, 14, 15), par le biais desquels le film (9) est agencé pour être alimenté à une tension prédéterminée de film, et un mécanisme d’entraînement (16, 17, 18, 19, 22) qui est agencé, si nécessaire, pour faire tourner le rouleau de film (8) dans une direction, dans laquelle le film (9) est rembobiné sur le rouleau de film (8) et qui est agencé pour recevoir sa commande d’un profil de guide (24) qui est dans la structure de piste circulaire (3),

caracterisée en ce que le dispositif d’alimentation de film (1) comprend également :

- un mécanisme (10, 11, 20, 23) qui est agencé pour déconnecter et reconnecter ledit contact, dans lequel ledit mécanisme est contrôlé sur la base de la tension du film ou sur la base de l’emplacement du dispositif d’alimentation de film (1) sur ladite piste, ou sur la base des deux.

2. Enveloppeuse selon la revendication 1, caractérisée en ce que ledit mécanisme est agencé pour déconnecter ledit contact lorsque la tension de film est prédéterminée ou supérieure à celle-ci, et pour reconnecter le contact lorsque la tension de film est inférieure à la valeur prédéterminée.

3. Enveloppeuse selon la revendication 1 ou 2, caractérisée en ce que ledit mécanisme est agencé pour recevoir sa commande d’un profil de guide (24) qui est dans la structure de piste circulaire (3) et placé sur au moins une section de ladite piste.

4. Enveloppeuse selon l’une quelconque des revendications 1 à 3, caractérisée en ce que ledit mécanisme est prévu avec au moins une roue (23) roulant le long de la structure de piste circulaire (3), sur la base de la position de laquelle, ledit mécanisme est contrôlé.

5. Enveloppeuse selon l’une quelconque des revendications 1 à 4, caractérisée en ce que ledit mécanisme d’entraînement comprend au moins une roue (16) roulant le long de la structure de piste circulaire (3), qui peut s’éloigner de la structure de piste circulaire (3) et revenir, au moyen dudit mécanisme.

6. Enveloppeuse selon l’une quelconque des revendications 1 à 5, caractérisée en ce que ledit mécanisme d’entraînement est agencé pour permettre la rotation du rouleau de film (8) dans une direction dans laquelle le film (9) est alimenté autour de la pièce à envelopper, lorsque la tension du film est prédéterminée ou supérieure à celle-ci.

7. Enveloppeuse selon l’une quelconque des revendications 1 à 6, caractérisée en ce que ledit mécanisme d’entraînement est séparé par rapport au mécanisme d’entraînement qui, est agencé à son tour pour entraîner le dispositif d’alimentation de film (1) le long de ladite piste.

8. Enveloppeuse selon l’une quelconque des revendications 1 à 7, caractérisée en ce que la source de la force d’entraînement pour ledit mécanisme d’entraînement est le mouvement mutuel entre le dispositif d’alimentation de film (1) et la structure de piste circulaire (3) qui, via ledit contact, est simultanément agencée pour maintenir le fonctionnement du mécanisme d’entraînement.

9. Enveloppeuse selon l’une quelconque des revendications 1 à 8, caractérisée en ce que ledit mécanisme comprend un ensemble de leviers (20), auquel le mécanisme d’entraînement (16, 17, 18, 19, 22) est couplé, et dont la position est agencée pour être contrôlée par l’effet de force qui dépend de la tension du film.

10. Enveloppeuse selon l’une quelconque des revendications 1 à 9, caractérisée en ce que ledit méca-
nisme comprend des moyens (10) pour détecter la tension du film.

11. Enveloppeuse selon la revendication 10, **caractérisée en ce que** les moyens (10) pour détecter la tension du film comprennent un rouleau de came (10) qui est placé contre le film (9) et dont la position dépend de l'effet de force de la tension de film.

12. Dispositif d'alimentation de film pour une enveloppeuse, dans lequel le dispositif d'alimentation de film (1) comprend au moins :

- des moyens pour fixer un rouleau de film (8) dans le dispositif d'alimentation de film (1) d'une manière rotative,
- des moyens d'alimentation (12, 13, 14, 15) par le biais desquels le film (9) est agencé pour être alimenté à une tension prédéterminée de film autour de la pièce à envelopper, et
- un mécanisme d’entraînement (16, 17, 18, 19, 22) qui est agencé, si nécessaire, pour faire tourner le rouleau de film (8) dans une direction, dans laquelle le film (9) est rembobiné sur le rouleau de film (8) et qui est agencé pour recevoir sa force d’entraînement au moyen d’un contact mécanique (26) qui est entre le mécanisme d’entraînement (16, 17, 18, 19, 22) et la structure de piste circulaire (3), dans lequel le dispositif d’alimentation de film (1) est en outre agencé dans l’enveloppeuse et est agencé pour se déplacer le long d’une piste agencée dans l’enveloppeuse,

**caractérisé en ce que** le dispositif d’alimentation de film (1) comprend également :

- un mécanisme (10, 11, 20, 23) qui est agencé pour déconnecter et reconnecter ledit contact, dans lequel ledit mécanisme est contrôlé sur la base de la tension du film ou sur la base de l’emplacement du dispositif d’alimentation de film (1) sur ladite piste, ou sur la base des deux.

13. Dispositif d’alimentation de film selon la revendication 12, **caractérisé en ce que** ledit mécanisme comprend des moyens (10) pour détecter la tension du film.

14. Dispositif d’alimentation de film selon la revendication 12 ou 13, **caractérisé en ce que** ledit mécanisme est agencé pour recevoir sa commande de la structure de piste circulaire.
Fig. 1

Fig. 2

Fig. 3
REFERENCES CITED IN THE DESCRIPTION

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