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(54) **Method for the application of reel end discs in a wrapping line to the ends of a reel to be wrapped.**

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Description

The present invention is concerned with a method for the application of reel end discs in a wrapping line to the ends of a horizontal reel to be wrapped, whereat, for the application of the discs, the reel moves on the wrapping line to the position between end presses and the reel end discs to be applied to the reel ends are fitted onto the faces of the end presses facing towards each other, the end discs being pulled against the faces of the end presses by means of negative pressure, and that the reel end discs are pressed by means of the end presses onto the ends of the reel located between the end presses, and attached to the reel ends, whereupon the end presses are shifted apart from each other and the wrapped reel moves away from between the end presses and a new reel is shifted to the position between the end presses for application of the reel end discs. This method is disclosed in US—A—3 393 492.

Today, the reel end discs are attached to the ends of the reel to be wrapped by using end presses, but the reel end discs are separate from each other, and they must be fitted onto the press faces of the end presses as well as be aligned in the correct position, for example, manually. In this case, of course, the reel end discs are separate discs apart from each other. It is an object of the present invention to make the said inconvenient working step automatic, and this is achieved in an automatic reel wrapping line by, among other things, using reel end discs arranged in the form of a band.

The method in accordance with the invention is mainly characterized in that the reel end discs are supplied to the end presses from vertical rolls of reel end discs in the form of a band so that the first reel end discs which have been pulled into basic positions by pulling rolls are grasped by means of transfer devices in their basic positions and, by means of the transfer devices and the pulling rolls, the reel end discs whose edge portions are attached to each other, are pulled off the rolls of reel end discs until it is noticed, by means of aligning means, that the next reel end discs are in their basic positions, the first reel end discs are cut loose from the next reel end discs placed in their basic positions, and they are transferred by means of the transfer devices to positions opposite the press faces of the end presses, whereupon, after they have been sucked onto these faces by said negative pressure means, the transfer devices release their grip and move further to their basic positions, and the first reel end discs are attached to the reel ends when the plastic coating on the first reel end discs, placed against the reel ends, melts on heating of the press faces of the end presses.

The invention comes out more closely from the following description and from the attached drawings, wherein

Figure 1 shows an automatic reel wrapping line

in accordance with the invention as viewed from above,

Figure 2 shows a section along line A—A in Fig. 2, and

Figure 3 is a detailed top view of the gripper of the transfer device.

The wrapping line includes end presses 3, whose press faces 6, facing towards each other, can be heated. The press faces 6 are additionally provided with numerous holes, which are connected to suction channels, through which a negative pressure can be produced at the press faces 6 for the purpose of sucking the reel end discs 4 onto the press faces 6. Moreover, the end presses 3 can be shifted towards each other to the pressing position and apart from each other to the basic position. Since the end presses 3, their actuating system, the vacuum system, and the system of heating of the press faces 6 involve nothing that was not known in prior art, the end presses 3 have not been illustrated in detail in the drawings, but a highly schematical mode of presentation has been found adequate.

In a position perpendicular to the longitudinal direction of the wrapping line, between the end presses 3, there is a horizontal carrier roll reeler 12, by means of which the reel 1 to be wrapped is aligned to the correct position between the end presses 3 for the purpose of attaching the reel end discs. At both sides of the wrapping line, there are vertical rolls 5 of reel end discs, from which the reel end discs 4 are supplied to the end presses 3 in the form of bands. The successive reel end discs 4 are attached to each other at their edge portions by means of narrow sections 10. From the rolls 5 of reel end discs the reel end discs 4 are guided by means of guide rolls 13 to between pulling rolls 8. Before the pulling rolls 8, there are aligning means 9, which comprise a photocell and a light detector. From the rolls 5 of reel end discs, the band of reel end discs is pulled by means of pulling rolls 8 until the aligning means 9 indicate that the first reel end discs 4 are in their basic positions. At that time the pulling rolls 8 stop. The aligning of the reel end discs 4 in the basic position by means of the photocells and light detectors takes place at the corner 11 formed at the edge of the narrow section 10 connecting the reel end discs 4.

The reel wrapping line includes transfer devices 7, by means of which the reel end discs 4 are transferred onto the press faces 6 of the end presses. The transfer device 7 includes a gripper 14, by means of which the edge portion of the reel end disc 4 to be transferred is grasped. In the basic position shown in Fig. 2, the gap of the gripper 14 is kept open by a spring 15. When the edge of a reel end disc 4 is to be grasped by means of the gripper 14, the gap of the gripper 14 is closed pneumatically by means of the cylinder-piston device 16. In view of different sizes of reel end discs, the height position of the gripper 14 has been arranged adjustable. The adjustment of the height position takes place preferably auto-

matically. It may be performed in any way whatsoever that is suitable for the purpose, e.g., hydraulically, pneumatically, by means of a rack-and-cogwheel combination, or by means of screw-spiral adjustment. Horizontal shifting of the gripper 14 is performed by means of a shifting mechanism 13. The length of the transfer movement obtained for the transfer device 7 by means of the shifting mechanism 13 while starting from the basic position, of course, depends on the size of the reel end disc 4 to be attached at each particular time, and the aligning takes place preferably automatically by means of limit switches. After the pulling rolls 8, there are cutters 15, by means of which the reel end discs 4 to be transferred are cut loose from the reel end discs 4 remaining in the basic position.

Below, the operation of the automatic reel wrapping line will be described. To begin with, it is found out what is the diameter of the reel 1 to be wrapped. Preferably, this takes place fully automatically, e.g., by means of a line of photocells. Hereupon, the reel 1 to be wrapped moves to the position between the end presses 3, being supported by the carrier roll reeler 12. At both sides of the wrapping line, there are several rolls 5 of reel end discs of different sizes of reel end discs. From among the rolls 5, the correct size of reel end disc is chosen, either manually or by means of some automatic system suitable for the purpose, and the first reel end disc 4 on the 5 is guided around the guide rolls 13 to between the pulling rolls 8. The pulling rolls 8 pull the reel end disc 4 until the aligning means 9 indicate that the first reel end discs 4 are in the basic positions and the pulling rolls stop. The gripper 14 of the transfer device in the basic position is in the open position and, by means of its automatic aligning system, the gripper 14 finds out the correct height position. Once the gap of the gripper 14 is aligned in the correct position, the gripper 14 grasps the edge of the reel end disc 4 pneumatically. Hereupon the shifting means 13 and the pulling rolls 8 are started and carry the band of reel end discs off the rolls 5 of reel end discs at the same track speed. The pulling rolls 8 stop when the following reel end discs 4 reach their basic positions indicated by their aligning means 9. Thereat the cutters 15 cut off the narrow section 10 connecting the reel end discs, return to their basic positions, and the transfer devices 7, actuated by the shifting mechanisms 13, continue to carry the reel end discs 4 to the end presses 3. The movement of the shifting mechanisms 13 stops when the centre lines of the reel end disc 4 and of the reel 1 to be wrapped are on the same axis. As was already stated above, this aligning takes place preferably automatically by means of limit switches.

When the reel end discs 4 to be applied to the ends of the reel 1 to be wrapped are at their correct positions at the press faces 6 of the end presses 3, the reel end discs 4 are sucked by means of the vacuum arrangement of the end presses onto the press faces 6. Next, the grippers

14 release their grasps on the reel end discs 4 and continue their movement, as carried by the shifting mechanisms 13, by the distance of the gap portion of the gripper 14 forwards. Hereupon, the shifting mechanisms 13 carry the grippers 14 to their basic positions. A gripper 14 that has come back to its basic position is automatically controlled so as to grasp the edge of the next reel end disc 4 that has arrived at its basic position.

The reel end discs 4 that were sucked onto the press faces 6 of the end presses 3 are pressed against the ends 2 of the reel 1 to be wrapped. The faces of the reel end discs 4 that are to be placed against the ends 2 of the reel to be wrapped have been coated with a hot-melt agent suitable for the purpose. In the compression position, the press faces 6 of the end presses 3 are heated, whereby the hot-melt layers on the reel end discs 4 melt and the reel end discs 4 adhere to the ends 2 of the reel 1 to be wrapped. Next, the end presses 3 are shifted apart from each other by means of shifting means, and the wrapped reel 1 moves away from between the end presses 3, and a new reel moves to the position between the end presses 3 for the application of the reel end discs 4.

Claims

1. Method for the application of reel end discs in a wrapping line to the ends (2) of a horizontal reel (1) to be wrapped, whereat, for the application of the discs, the reel (1) moves on the wrapping line to the position between end presses (3) and the reel end discs (4) to be applied to the reel (1) ends (2) are fitted onto the faces (6) of the end presses (3) facing towards each other, the end discs being pulled against the faces of the end presses by means of negative pressure, and that the reel end discs (4) are pressed by means of the end presses (3) onto the ends (2) of the reel (1) located between the end presses (3), and attached to the reel ends, whereupon the end presses (3) are shifted apart from each other and the wrapped reel (1) moves away from between the end presses (3) and a new reel is shifted to the position between the end presses (3) for application of the reel end discs (4), characterized in that the reel end discs (4) are supplied to the end presses (3) from vertical rolls (5) of reel end discs in the form of a band so that the first reel end discs (4) which have been pulled into basic positions by pulling rolls (8) are grasped by means of transfer devices (7) in their basic positions and, by means of the transfer devices (7) and the pulling rolls (8), the reel end discs (4), whose edge portions are attached to each other, are pulled off the rolls (5) of reel end discs until it is noticed, by means of aligning means (9), that the next reel end discs (4) are in their basic positions, the first reel end discs (4) are cut loose from the next reel end discs placed in their basic positions, and they are transferred by means of the transfer devices (7) to positions opposite the press faces (6) of the end presses (3), whereupon, after they have been

sucked onto these faces by said negative pressure means, the transfer devices (7) release their grip and move further to their basic positions, and the first reel end discs (4) are attached to the reel (1) ends (2) when the plastic coating on the first reel end discs (4), placed against the reel (1) ends (2), melts on heating of the press faces (6) of the end presses (3).

2. Method as claimed in claim 1, characterized in that the aligning of the reel end discs (4) in their basic positions is performed by means of photo-cells and light detectors on the basis of the corner (11) formed at the edge of the narrow section (10) connecting the reel end discs (4) to each other.

Patentansprüche

1. Verfahren zum Anbringen von Rollendscheiben in einer Einwickelanlage an den Enden (2) einer einzuwickelnden waagerechten Rolle (1), wobei sich die Rolle (1) zwecks Anbringung der Scheiben in der Einwickelanlage in die Position zwischen den Endpreßeinheiten (3) bewegt und die an die Enden (2) der Rolle (1) anzubringenden Rollendscheiben (4) an den aufeinander zugewandten Stirnflächen (6) der Endpreßeinheiten (3) unter Anziehung durch negativen Druck an die Stirnflächen der Endpressen (3) angebracht werden, und wobei die Rollendscheiben (4) mit Hilfe der Endpreßeinheiten (3) an die zwischen den Endpreßeinheiten (3) befindlichen Enden (2) der Rolle (1) angepreßt und an die Rollenenden angebracht werden, worauf die Endpreßeinheiten (3) auseinanderbewegt werden und sich die eingewickelte Rolle (1) aus der Position zwischen den Endpreßeinheiten (3) fortbewegt und eine neue Rolle zwecks Anbringung der Rollendscheiben (4) in die Position zwischen den Endpreßeinheiten (3) bewegt wird, dadurch gekennzeichnet, daß die Rollendscheiben (4) den Endpreßeinheiten (3) von senkrechten Rollendscheiben (5) aus den Endpreßeinheiten (3) in der Form eines Bandes zugestellt werden, so daß die ersten Rollendscheiben (4), nachdem sie durch Ziehrollen (8) in Grundpositionen gezogen wurden, mit Hilfe von Transfervorrichtungen (7) in ihren Grundpositionen erfaßt und die Rollendscheiben (4), deren Kantenteile aneinander angebracht sind, mit Hilfe von Transfervorrichtungen (7) und den Ziehrollen (8) von den Rollendscheibenrollen (5) abgezogen werden, bis mit Hilfe einer Ausrichteinrichtung (9) festgestellt wird, daß sich die nächsten Rollendscheiben (4) in ihren Grundpositionen befinden, die ersten Rollendscheiben (4) von den nächsten in ihren Grundpositionen befindlichen Rollendscheiben abgeschnitten und mit Hilfe von Transfervorrichtungen (7) in Positionen gegenüber den Stirnflächen (6) der Endpreßeinheiten (3) übertragen werden, worauf, nachdem die besagten Rollendscheiben durch den besagten negativen Druck an diese Stirnflächen angesaugt wurden, die Transfervorrichtungen (7) ihren Griff entspannen und sich weiter in ihre Grundpositionen

bewegen und die ersten Rollendscheiben (4) an den Enden (2) der Rolle (1) angebracht werden, wobei der Kunststoffüberzug an den ersten Rollendscheiben (4) an den Enden (2) der Rolle (1) bei Erhitzung der Preßflächen (6) der Endpreßeinheiten (3) schmilzt.

2. Ein Verfahren im Einklang mit Anspruch 1, dadurch gekennzeichnet, daß die Ausrichtung der Rollendscheiben (4) in ihren Grundpositionen mit Hilfe von Fotozellen und Lichtdetektoren unten an der Ecke (11) am Rande des schmalen Querschnitts (10), der die Rollendscheiben (4) miteinander verbindet-bewirkt wird.

Revendications

1. Procédé pour l'application de disques d'extrémité pour rouleaux, dans une ligne d'enveloppement, aux extrémités (2) d'un rouleau horizontal à envelopper, selon lequel, pour l'application des disques, le rouleau (1) se déplace sur la ligne d'enveloppement à la position entre les presses d'extrémité (3) et les disques d'extrémité de rouleau (4) à appliquer aux extrémités (2) du rouleau (1) sont montés sur les faces (6) des presses d'extrémité (3) qui se font face, et les disques d'extrémité sont attirés contre les faces des presses d'extrémité par une pression négative, et les disques d'extrémité de rouleau (4) sont poussés par les presses d'extrémité (3) sur les extrémités (2) du rouleau (1) situé entre les presses d'extrémité (3), et attachés aux extrémités du rouleau, après quoi les presses d'extrémité (3) sont écartées l'une de l'autre et le rouleau enveloppé (1) s'éloigne d'entre les presses d'extrémité (3) et un nouveau rouleau est mu à la position entre les presses d'extrémité (3) pour l'application des disques d'extrémité de rouleau (4), caractérisé par le fait que les disques d'extrémité de rouleau (4) sont fournis aux presses d'extrémité (3) par à partir de cylindres verticaux (5) de disques d'extrémité de rouleau sous forme de bande de sorte que les premiers disques d'extrémité de rouleau (4) qui ont été attirés aux positions de base par des cylindres de traction (8) sont saisis par des dispositifs de transfert (7) à leurs positions de base et, grâce aux dispositifs de transfert (7) et aux cylindres de traction (8) les disques d'extrémité de rouleaux (4), dont les parties de bord sont attachées l'une à l'autre, sont détachés des cylindres (5) de disques d'extrémité de rouleaux jusqu'à ce qu'il soit observé, à l'aide du dispositif d'alignement (9), que les disques d'extrémité (4) suivants sont à leurs positions de base, les premiers disques d'extrémité de rouleau (4) sont coupés des disques d'extrémité suivants positionnés à leurs positions de base, et ils sont transférés par les dispositifs de transfert (7) à des positions en face des faces de presse (6) des presses d'extrémité (3), et après qu'ils aient été aspirés à ces faces par ladite pression négative, les dispositifs de transfert (7) lâchent leur prise et continuent à se déplacer vers leurs positions de

base, et les premiers disques d'extrémité de rouleaux (4) sont attachés aux extrémités (2) du rouleau (1) quand le revêtement plastique des premiers disques d'extrémité de rouleau (4),

placé contre les extrémités (2) du rouleau (1), fond quand les faces (6) des presses d'extrémité (3) se chauffent.

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Fig.1.

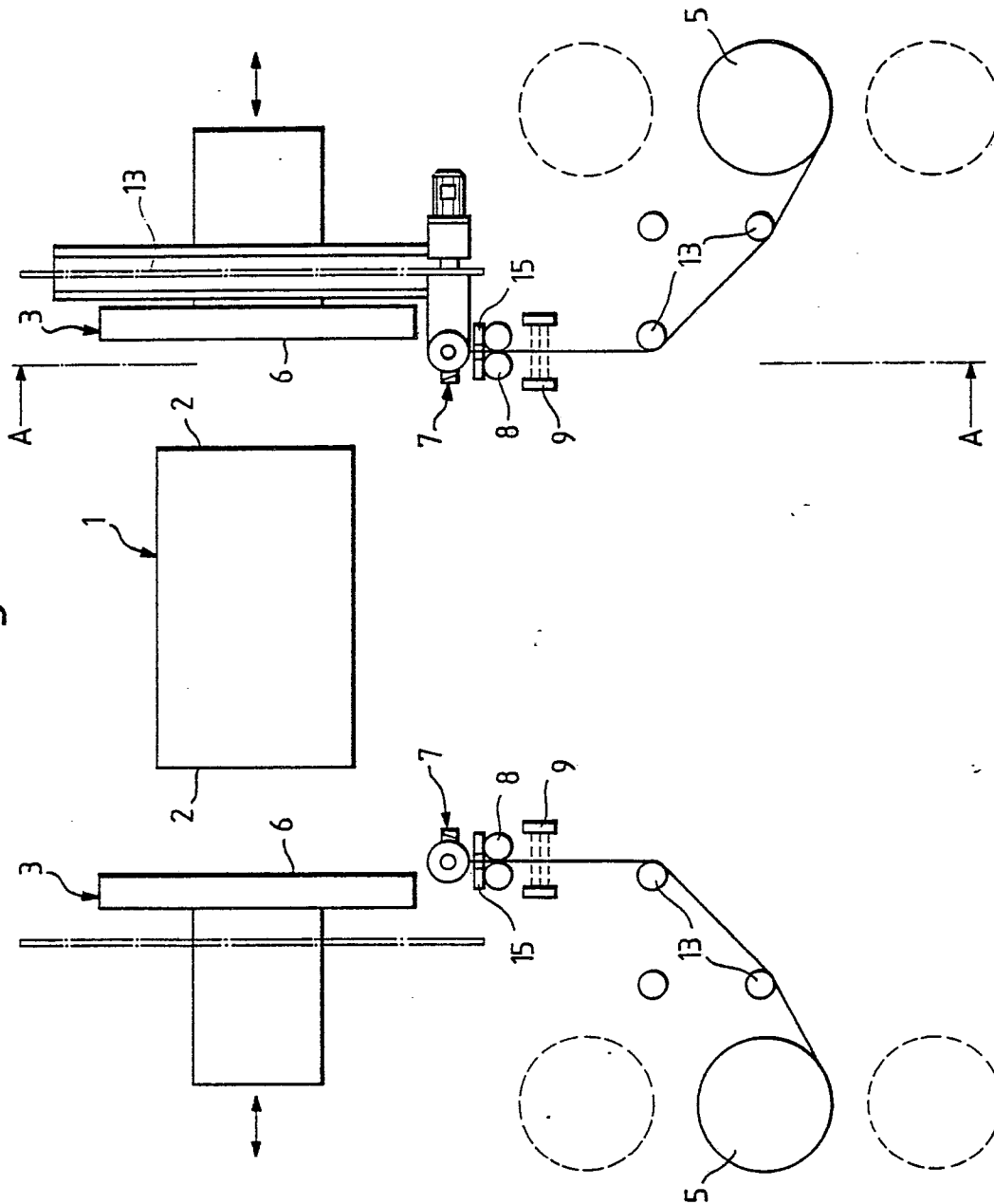


Fig.2.

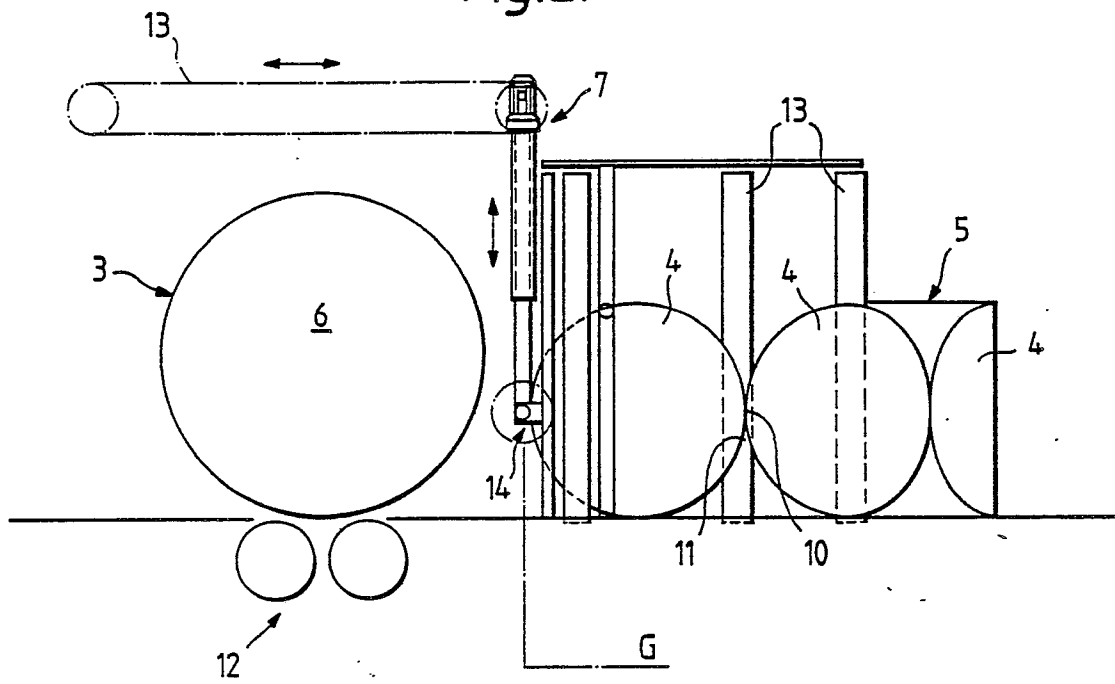


Fig.3.

