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Device for transporting a product section

The invention relates to a device for transporting a product section in two intersecting transport directions, as claimed in the preamble of claim 1.

Such a device serves to remove or pull material from a product stock or a product roll, to cut an appropriate product section, and to supply this product section to a downstream device, for example to a sewing device for hemming the edges. Known devices of this type require a relatively large amount of space and consist of a large number of elements which have to be connected to one another in a complex manner and carry out movement sequences which are suitably adapted to one another.

Based on this prior art, the object of the invention is to provide a device of the generic type which requires a relatively small amount of space, which works rapidly, and in which only a few work cycles are required for the transfer from the first transport device to the second transport device, wherein short distances are desired and trouble-free operation is to be ensured.

This object is achieved as specified in claim 1.

By virtue of this arrangement and design, a space-saving structure can be formed which moreover can be produced in a cost-effective manner and while minimizing the number of functional parts that are required. The device operates very rapidly and with only a few work cycles, wherein short distances for transporting and transferring the product section are achieved and trouble-free operation is ensured.

Advantageous embodiments are specified in the dependent claims.

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One schematic example of embodiment is shown in the drawing and described in the text below. In the drawing:

Fig. 1 shows essential components of the device in a side view and in a first working position;

Fig. 2 shows the same in a second working position;

Fig. 3 shows the same in a third working position;

Fig. 4 shows the same in a fourth working position.

The drawing shows the essential elements of a device for transporting a product section 1 which is cut from a product web during operation of the device. In order to transport the product section 1, the device has two intersecting transport directions, wherein one transport direction is shown at 2 and the second transport direction passes through the plane of the drawing from the front to the back. To this end, the device consists of a first transport device 3 by means of which a product web 1' can be pulled from a product stock or a product roll. The first transport device 3 can be moved essentially horizontally, in the direction of the movement arrow 2, in a first transport direction up to a transfer point of the end of the product web 1', namely into the position shown in Fig. 1. The device has a holding device 4 by means of which the end of the product web 1' can be fixed or held. Once the product web 1' has been fixed by means of the holding device 4, the transport device 3 moves out of the position shown in Fig. 1 and into the position shown in Fig. 2, into a pulling position. The pulled length of the product web 1' corresponds to the length of the product section 1 which is to be cut. The product web 1' can be cut by means of a cutting device 5, for example manually operated or preferably motor-operated scissors, so that the product section 1 is produced. Furthermore, a second transport

device 6 is provided, by means of which the edges of the product section 1 running transversely to the first transport direction 2 of the first transport device 3 can be fixed close to the respective end of the product section 1 and the product section 1 is transported in a second transport direction oriented transversely to the first transport direction 2. The second transport device 6 consists of a first pair of clamping and transport parts, which pair is arranged close to the transfer point and consists of a first part 7 arranged above the product web 1' and a second part 8 arranged below the product web. Said second part can be moved toward the first part 7 and away from the latter, in the direction of the movement arrow 9. Also provided is a second pair of clamping and transport parts which is arranged at a distance from the first pair, namely closer to the pulling position shown in Fig. 2 and at a distance from the transfer point shown in Fig. 1, and consists of a third part 10 which is likewise arranged above the product web 1' and a fourth part 11 arranged below the product web. This fourth part 11 can be moved toward the third part 10 and away from the latter, in the direction of the movement arrow 12.

The second pair comprising the parts 10 and 11 is closely adjacent to the first pair comprising the parts 7 and 8, and this is advantageous with regard to the narrow design of the device as a whole.

In the position shown in Fig. 1, the first transport device 3 firstly takes up the end of the product web 1' and fixes it by means of the device 4.

Thereafter, the first transport device 3 moves to the left in the drawing, into the position shown in Fig. 2, wherein the product web 1' is carried along therewith. From this position, the first transport device 3 moves back to the right in the direction of the movement arrow

2, into a desired position which is shown in Fig. 3. Here, the first transport device 3 together with the element 4 moves until it comes into the direct vicinity of the second pair of clamping and transport parts 10, 11, so that the product web 1' or the product section 1 which has just been cut forms a loop which sags downward, as shown in Fig. 3.

During this movement, the fourth part 11, which forms part of the second pair of clamping and transport parts, is moved downward and to the left in such a way that the forming of the loop and also the transporting of the looped product web or of the looped product section 1 by means of the first transport device 3 take place in a manner unhindered by the fourth part 11. The loop can be moved freely above the part 11. In the desired position, which is shown in Fig. 4, the fourth part 11 is guided upward and to the right, without touching the loop, into the working position in which the edge of the product web 1' or of the product section 1 is pressed against the third part 10. In this position, the second part 8 is also pressed against the first part 7 of the first pair to clamp the other edge region of the product section 1. The cut product section 1 is then transported away in the second transport direction by means of the two pairs consisting of the parts 7, 8 and 10, 11.

The first transport device 3 consists of a clamping gripper 4 which is held on a machine frame common to all parts and can be moved horizontally into the various positions. A horizontal resting plate for the product web 1' may possibly be arranged between the product stock, which is arranged at a distance to the right of the illustrated device, and the second transport device 6.

The first part 7 of the first pair of clamping and transport parts consists of a belt drive which is arranged on the machine frame and is arranged a little

above the product web 1' or the product section 1, so that, when said product web is moved by the first transport device 3, there is no contact between the product web and the belt drive. The second part 8 of the first pair is a clamping bar which can be moved, for example by means of a pneumatic cylinder, out of a rest position shown in Figs. 1 and 2 in which it is at a vertical distance from the product web or product section 1, 1' and into a transport position shown in Figs. 3 and 4 in which it is pressed against the lower half of the belt drive, wherein the right-hand edge of the product section 1 is clamped between the parts 7 and 8.

The vertical distance of the first and second parts 7, 8 of the first pair of clamping and transport parts from one another in the rest position shown in Figs. 1 and 2 is large enough that the transport device 3, in particular the clamping gripper 4 thereof, can pass between them, without being hindered by the parts 7, 8 or even the parts 10, 11, as can be seen in particular in Figs. 1 and 2.

The third part 10 of the second pair of clamping and transport parts is a second belt drive which is likewise arranged on the machine frame and is preferably operated synchronously with the first belt drive. This third part is also arranged a little above the product web 1' or product section 1. The fourth part 11 is once again a clamping bar which can be moved out of a rest position shown in Figs. 1 and 2, in the vertical and horizontal direction, and into a transport position shown in Figs. 3 and 4 in which it is pressed against the lower half of the belt drive. The movement of the part 11 is designed in such a way that this part can be guided past the formed loop of product section 1 without touching it and the loop is not delayed or touched as the part 11 moves upward. For this reason, a purely vertical movement of the part 11 is undesirable since, in the case of a purely

vertical movement, the loop of product section 1 would be deformed and distorted.

In order to be able to precisely control the movement of the fourth part 11 of the second pair, an arrangement of pneumatic cylinders could be provided which exert a movement in the direction of the movement arrow 12. However, a guide 13 which is fixed to the frame is preferably provided, said guide nevertheless being shown only schematically in the drawing. This guide 13 which is fixed to the frame consists of pairs of oblique guide runners or guide racks which are oriented in the movement direction 12 or of pairs of runners or racks which form parallel curved tracks, said pairs being arranged beside the product section 1, in particular beside the descending surface of the loop of the product web or product section 1. The fourth part 11 may be guided for example by means of slideways or by means of toothed wheels on the guide runners or racks, respectively. Instead of the rectilinear movement in the direction of the movement arrow 12, as shown in the drawing, a curved movement from the lower position of the part 11, as shown in Figs. 1 and 2, into the upper position as shown in Figs. 3 and 4 is also possible. By virtue of this embodiment, it is possible to implement the desired movement sequences in a very short time, over a short distance and with few work cycles, and to cut and transport the product section 1 in two intersecting movement directions.

The invention is not restricted to the example of embodiment but rather can be widely varied within the scope of the disclosure.

All the novel individual and combined features disclosed in the description and/or drawing are to be regarded as essential to the invention.

Patent Claims

1. A device for transporting a product section (1) in two intersecting transport directions, said device consisting of a first transport device (3) for pulling a product web (1') from a product stock, which first transport device can be moved in a first transport direction (2) up to a transfer point of the end of a product web (1'), has a holding device (4) for fixing the end of the product web (1') and can be moved from the transfer point, counter to the first transport direction (2), into a pulling position, so that an appropriate length of product web which corresponds to a product section (1) can be pulled from the product stock, a cutting device (5) for cutting the product section (1) from the product web (1') and a second transport device (6) by means of which the edges of the product section (1) running transversely to the first transport direction (2) of the first transport device (3) can be fixed close to the respective end of the product section (1) and the product section (1) can be transported in a second transport direction oriented transversely to the first transport direction (2), wherein the second transport device (6) consists of a first pair of clamping and transport parts, which pair is arranged close to the transfer point and consists of a first part (7) arranged on one side of the product web (1') and a second part (8) arranged on the other side of the product web (1'), wherein the parts (7, 8) can be moved toward one another and away from one another, and also a second pair of clamping and transport parts which is arranged at a distance from the first pair, closer to the pulling position and at a distance from the transfer point and consists of a third part (10) arranged on one side of the product web (1') and a fourth part (11) arranged on the other side of the product web (1'), wherein the parts (10, 11) can be moved toward one another and away from one another, wherein the second pair is adjacent to the

first pair, the first transport device (3), which by means of the holding device (4) fixes the end of the product web (1), can be moved together with the fixed end of the product web out of the pulling position and back in the direction of the transfer point, into a desired position, and namely into the vicinity of the second pair of clamping and transport parts, so that the product web (1'), or the product section (1) which has just been cut, forms a sagging loop, characterized in that the fourth part (11), which forms part of the second pair of clamping and transport parts, can be moved in the direction in which the loop extends, transversely with respect to the first transport direction, so that the forming of the loop and the transporting of the looped product web (1') or of the looped product section (1) by means of the first transport device (3) take place in a manner unhindered by the fourth part (11), and in the desired position the fourth part (11) is moved into the working position essentially without touching the loop, in which working position one edge of the product web (1') or of the product section (1) is pressed against the third part (10), wherein the second part (8) is also pressed against the first part (7) of the first pair to clamp the other edge region of the product web (1') or product section (1) and the cut product section (1) is transported away by the two pairs in the second transport direction.

2. The device as claimed in claim 1, characterized in that the fourth part (11) can additionally be moved in the first transport direction and counter to said direction.

3. The device as claimed in claim 2, characterized in that the fourth part (11) can simultaneously be moved transversely to and along the first transport direction.

4. The device as claimed in any of claims 1 to 3, characterized in that the fourth part (11) of the second pair is guided on a guide (13) which is fixed to the frame.

5. The device as claimed in claim 4, characterized in that the guide (13) which is fixed to the frame consists of pairs of oblique, rectilinear guide runners or guide racks or of pairs of runners or racks which form parallel curved tracks, said pairs being arranged beside the descending surface of the loop of the product web (1') or product section (1), wherein the fourth part (11) is guided by means of slideways on the pairs of guide runners or by means of toothed wheels on the pairs of racks.

6. The device as claimed in any of claims 1 to 5, characterized in that the first transport device (3) consists of a clamping gripper which is held on a machine frame and can be moved horizontally into the various positions.

7. The device as claimed in any of claims 1 to 6, characterized in that a horizontal resting plate for the product web (1') is arranged between the product stock and the second transport device (6).

8. The device as claimed in any of claims 1 to 7, characterized in that the first part (7) of the first pair of clamping and transport parts consists of a belt drive which is fixed to the frame and is arranged a little above the product web (1') or the product section (1), and the second part (8) of the first pair is a clamping bar which can be moved out of a rest position in which it is at a vertical distance from the product web (1') or product section (1) and into a transport position in which it is pressed against the lower half of the belt drive.

9. The device as claimed in any of claims 1 to 8, characterized in that the vertical distance of the first and second parts (7, 8) of the first pair of clamping and transport parts from one another in the rest position is greater than the height of the first transport device which passes between them, in particular the clamping gripper.

10. The device as claimed in any of claims 1 to 9, characterized in that the third part (10) of the second pair of clamping and transport parts is a belt drive which is fixed to the frame and is arranged a little above the product web (1') or product section (1), and the fourth part (11) of the second pair is a clamping bar which can be moved out of a rest position, in the vertical and horizontal direction, and into a transport position in which it is pressed against the lower half of the belt drive.