(12) PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 199941330 B2**
(10) Patent No. **742055**

(54) Title
Device and method for transporting a flat article

(51)[7] International Patent Classification(s)
D05B 033/00 **B65H 005/04**
A41H 043/02 **B65H 029/46**

(21) Application No: **199941330** (22) Application Date: **1999.04.01**

(87) WIPO No: **WO00/04218**

(30) Priority Data

(31) Number	(32) Date	(33) Country
19831992	**1998.07.16**	**DE**

(43) Publication Date : **2000.02.07**
(43) Publication Journal Date : **2000.04.20**
(44) Accepted Journal Date : **2001.12.13**

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(56) Related Art
US 5637183
US 4773341
CH 660719

41330/99

PCT WELTORGANISATION FÜR GEISTIGES EIGENTUM
Internationales Büro

INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

(51) Internationale Patentklassifikation 7 : D05B 33/00, B65H 29/46, 5/04, A41H 43/02 — A1

(11) Internationale Veröffentlichungsnummer: **WO 00/04218**

(43) Internationales Veröffentlichungsdatum: 27. Januar 2000 (27.01.00)

(21) Internationales Aktenzeichen: PCT/DE99/01058

(22) Internationales Anmeldedatum: 1. April 1999 (01.04.99)

(30) Prioritätsdaten:
198 31 992.4 16. Juli 1998 (16.07.98) DE

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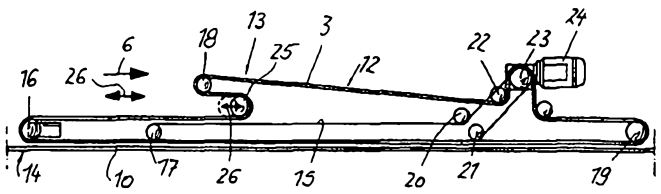
(81) Bestimmungsstaaten: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO Patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Veröffentlicht
Mit internationalem Recherchenbericht.

(54) Title: DEVICE AND METHOD FOR TRANSPORTING A FLAT ARTICLE

(54) Bezeichnung: VORRICHTUNG UND VERFAHREN ZUM TRANSPORT EINES FLÄCHIGEN WARENSTÜCKES



(57) Abstract

The present invention relates to a device for transporting a flat article that can be transferred in a horizontal direction from a first transport means to a second transport means, wherein said device is used for easily and continuously transporting isolated articles one after the other and at an accurate distance from one another. To this end, the second transport means essentially comprises a first continuous-handling apparatus (12) of the strip, belt or chain type that includes two transport members (3) placed at a distance from each other across the transport direction. Each transport member (3) is associated with a strip-shaped support surface (10) which is parallel to the transport direction (6) and on which each transport member (3) rests during the sequential displacement of the articles, wherein edge portions of the article (1') are placed between the transport member (3) and the support surface (10). Each of the transport members (3) is diverted and guided so as to form a buffer loop (13) and so that the diversion area (14) of the transport member (3), which is directed in a direction opposite to the transport direction (6), can be displaced from a base position, in the direction opposite to the transport direction (6) and in parallel thereto, into a transfer position, the transport member (3) being driven simultaneously.

(57) Zusammenfassung

Um eine Vorrichtung zum Transport eines flächigen Warenstückes, das in horizontaler Ausrichtung von einem ersten Transportmittel an ein zweites Transportmittel übergebbar ist, zu schaffen, die es in einfacher Weise ermöglicht, vereinzelte Warenstücke in exaktem Abstand voneinander nacheinander kontinuierlich abzutransportieren, wird vorgeschlagen, daß das zweite Transportmittel im wesentlichen aus einem ersten band-, riemen- oder kettenartigen Stetigförderer (12) mit zwei quer zur Fördereinrichtung voneinander beabstandeten Förderelementen (3) besteht, denen jeweils eine sich parallel zur Fördereinrichtung (6) verlaufende, streifenartige Auflagefläche (10) zugeordnet ist, auf der das jeweilige Förderelement (3) sich beim Ablauf unter Zwischenlage von Randteilen des Warenstückes (1') abstützt, und daß jedes der beiden Förderelemente (3) unter Bildung einer Pufferschlaufe (13) derart umgelenkt und geführt ist, daß der entgegen der Transportrichtung (6) gerichtete Umlenkbereich (14) des Förderelementes (3) unter Mitnahme des Förderelementes (3) aus einer Grundstellung entgegen Transportrichtung (6) parallel zur Transportrichtung in eine Übernahmestellung verstellbar ist.

Device and method for transporting a flat piece of material

The invention concerns a device for the transportation of a flat piece of material, for instance a piece cut off a continuous length of textile, paper, cardboard, plastic, sheet metal or foil, whereby the piece of material is transferred in mainly horizontal orientation from a first conveyor to a second conveyor.

Furthermore, the invention concerns a method for the transportation of pieces of material.

In the state of the art a device for the transportation of pieces of material, in particular of pieces of textile separated from a continuous length of textile, is known. This consists of a discontinuously operating conveyor, by means of which a continuous length of textile is removed from a storage point and the free end of the continuous length to be separated is possibly held under tension, and also of a second continuously operating conveyor, whose transport plane runs parallel to the transport plane of the first conveyor and has means for holding the separated pieces of textile, whereby the transport direction of the

first conveyor runs parallel to the longitudinal direction of the continuous material and the transport direction of the second conveyor runs at right angles to the longitudinal direction of the continuous material, whereby the first conveyor preferably consists of a slide bar and gripper, whereby the gripper can be adjusted to and away from the slide bar, a separating device is arranged between slide bar and gripper by means of which the continuous length of textile can be separated into individual pieces of textile, the separated piece of textile, after or at the same time as the separating cut and release by the first conveyor, in particular slide bar and gripper, can by means of a transfer device be pushed towards and fed into the plane of the second conveyor from the plane of the first conveyor.

According to the state of the art it is usual that a continuous length of textile is taken from a storage point and a piece is separated from this continuous length. This single piece is then transferred to a further-processing station or a forwarding station. As soon as the piece of textile has been carried away from the area where the continuous length is taken from the storage point, a further piece can be separated from the length of textile and carried away in turn.

Such constructions are disadvantageous, because in the time that the separated piece is transported from the area in which the separation takes place, it is not possible to cut a

further piece until the whole piece already cut off has been carried away. It is therefore not possible in the case of continuously running delivery equipment to remove the single pieces of textile so that they adjoin each other virtually without gaps and to direct them to a hemming or sewing device. On the contrary, there always remains a large gap between the individual pieces of textile which has a negative effect on the total number of pieces produced by the sewing equipment fed by this device.

Devices with superposed cross and longitudinal transport planes are already known. With these the piece of textile is fixed on needle ledges, separated from the continuous length of material and transferred by the needle ledges to needle chains acting as crossover conveyors. Such a device is complicated in regard to construction and alignment of the needle ledges and is difficult to handle, whereby there is the additional disadvantage of damage to the piece of textile which in many cases is not permitted.

In principle there exists with such devices, especially also devices of the type referred to in the characteristic part of Claim 1, the problem that it is extremely difficult to carry away the separated pieces of material at a specific distance from each other by means of the conveying elements, when in fact there should be hardly any gap at all.

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From DE 43 28 461 A 1 a method and an arrangement for the transportation of flat workpieces is known. It involves a lead conveyor and a following conveyor. These conveying devices deliver fabric pieces. The discontinuous transportation of the piece of textile by the lead conveying device takes place in such a way that when the lead conveyor starts with a piece of textile laid on its track, its track is extended sufficiently far over the track of the following conveyor that the workpiece can be moved in its entirety over the track of the following conveyor. Arrived at this position, the conveying means of the lead conveyor are stopped and the track of the lead conveyor is shortened so that the workpiece can be placed on the conveyor belt of the following conveyor.

With such an assembly a fast, almost gapless arrangement of workpieces on the following conveyor is not possible, because first the lead conveyor must be moved back from the position over the following conveyor, then a workpiece must be placed on the lead

conveyor and then the lead conveyor must advance again in order to be able to deposit the workpiece on the following conveyor.

A similar configuration is known from DE 11 32 861 B which involves a conveyor belt and a delivery device. The delivery device is a carriage movable in and against the conveyance direction of the conveyor belt. During the delivery process the carriage is moved against the direction of the conveyor belt, while at the same time the delivery belt stands still relative to the delivery table. It is furthermore proposed that the effective length of the delivery belt possibly including a guide plate extending the belt, is so geared to the set length of the to-and-fro motion of the carriage and the length of the track section to be traversed that at the start of its 'to' motion its front end comes in full or almost full contact with the top of the stack, preferably with a stop on the stacking table.

Based on the state of the art described in the introduction, the purpose of the invention is to create a similar device which in a simple manner makes it possible to continuously carry away single pieces of material at an exact distance from each other, possibly without gaps or virtually without gaps so that they can be fed to a downstream work station, e.g. in the case of pieces of textile to a sewing device and that the capacity of the downstream machine or equipment can be fully utilised.

The manner in which this purpose is met, is described in Claim1.

The second conveying device consists for instance of a belt-type conveyor which need not be of the endless type, but may also be a closed reverse-action conveyor section. By means of a conveying element or also the conveying elements mutually interspaced at right angles to the conveying direction, the piece of material can be engaged by a conveying element in an area parallel to the conveying direction whereby the conveying element presses the piece of material against the matching striplike bearing surface during transport. The distance between the conveying elements can if desired be adjusted to enable the conveyance of pieces of material of different widths. The fact that the respective conveying elements are guided and diverted in such a way that a buffer loop is formed, makes it possible to move the conveying elements against the actual transport direction with their deviation end which is antidirectional to the approaching piece of material (parallel to the conveying plane formed by the bearing surface). This makes it possible to take over an incoming piece of material earlier than if a stationary continuous conveyor were used. After the conveying elements have taken over the piece of material

they can be moved back again from the transfer position to the base position while holding the transferred piece of material so that there is place to receive a further piece of material which is again taken over by a conveying means moved to the transfer position against the transport direction.

With the alternative solution described in Claim 1 the complete conveying element with deviating roller and drive roller is shifted against the conveying direction during the rotation of the conveying element in order to take over the separated piece of material.

Subsequently the conveying element is moved back to the base position as the piece of material is carried along. The advantages gained from this match those mentioned above with reference to the first alternative.

A particularly advantageous embodiment is one whereby a further conveying element of a second continuous conveyor is arranged, parallel to the corresponding conveying elements of the first continuous conveyor, which conveying elements of the second continuous conveyor are driven in the same transport direction and at the same speed as the conveying elements of the first continuous conveyor and whereby the deviation area of the conveying elements of the first continuous conveyor can therefore be moved back in the transport direction from the transfer position to the base position, whereby the piece of material is transported by the conveying elements of the second continuous conveyor in the conveying direction and the deviation area of the first continuous conveyor which is braced on the piece of material and is moved back from the piece of material to the base position at transport speed. The proposed respective further

conveying elements of a second continuous conveyor parallel to the conveying elements of the first continuous conveyor are preferably arranged in close proximity to the conveying elements of the first continuous conveyor.

This ensures that the first piece of material taken over by the first conveying element is taken over by the conveying elements of the second continuous conveyor, whereby it is simultaneously in contact with the conveying elements of the first continuous conveyor. The conveying elements of the first continuous conveyor can be moved from the transfer

position to the base position in transport direction, whereby the first continuous conveyor virtually does not move relative to the piece of material, but is moved to the base position with the piece of material. Subsequently the continuous conveyor can be adjusted against the conveying direction for the transfer of a further piece of material i.e. either after reaching the base position or even before so that the conveying elements of the first continuous conveyor run towards the newly supplied piece of material, carry it at least to the engagement position of the second continuous conveyor and can then be moved back with the piece of material to the base position or an intermediate position, from which they can again be adjusted against the transport direction for the transfer of the next piece of material.

It is advantageous if both continuous conveyors are of the endless type.

In a particularly effective further development both continuous conveyors have toothed belts as conveying elements which engage with gear rollers acting as deviating rollers and drive rollers.

Furthermore it is preferable that the respective preferably closely adjacent conveying elements of the second continuous conveyor are driven by a common drive, whereby the

drives of the two pairs of conveying elements are driven synchronously and in the same direction.

A provision may also be made whereby the actuator driving the conveying element or the deviation area extending against the conveying direction, is coupled to or controlled by a device by means of which the presence and the required position of the piece of material can be detected under the continuous conveyor.

A provision may also be made whereby the actuator driving the conveying element or the deviation area extending against the conveying direction, is coupled to or controlled by a device by means of which the presence of a piece of material can be detected under the bottom run of the conveying element of the second continuous conveyor.

The proposed position detection devices may be light barriers, other non-contact detection devices or also touch probes or the like. By means of these detection elements it is e.g. possible to detect the trailing edge in conveying direction of the piece of material being carried or the leading edge in conveying direction of the next piece, or also during transfer by the first continuous conveyor, to detect the trailing edge in conveying direction of the piece of material held by the first continuous conveyor in order to position this with the edge precisely aligned under the axis of rotation of the roller forming the deviation area or the like. The next piece of material can then be moved close to this edge so that if desired it can be joined gapless or almost gapless to the already engaged piece of material.

Another preferred embodiment is mentioned in Claim 8.

The fact that the two conveyors are virtually superposed makes it possible to pull the piece of material, in particular the continuous length of textile, as far from the storage point as required by the size of the single piece. Subsequently the single piece of material can be separated from the continuous length, whereby the separation can be carried out by means of a rotary disc knife or a cutting bar. Before separation, the clamping device grips the piece of material along the transverse edges (seen in the longitudinal direction of the continuous material) and holds it in the correct position. Then the clamping device with the separated piece of material is transferred to the second transport plane in which the second continuously operating conveyor is arranged. The piece of material is so held at its edges that they project beyond the clamping devices arranged at both edges. In the plane of the second conveyor, the single piece of material is then moved towards this conveyor, whereby at the same time the second conveyor, preferably consisting of conveyor belts running continuously and braced on a supporting table or supporting

skids, is moved towards the clamping device against its forward motion.

The edge strips projecting at either end are then gripped by the second conveyor which carries the piece of material away. After transfer of the leading edge in transport direction to the second conveyor, the conveyor as it carries away the piece of textile moves back into the initial position in which the conveyor is distanced from the clamping device, whereby the clamping device is also moved back into the initial position i.e. away from the second conveyor and into the plane of the first conveyor.

As a result of this opposite movement of the second conveyor and the clamping device during transfer of the piece of material, the leading edge of the piece in the conveying direction of the second conveyor is placed immediately next to the trailing edge of the piece still being carried off by the second conveyor so that the following piece is carried along by the second conveyor virtually gapless or with a very slight gap and fed to further-treatment stations. This method also prevents damage of the piece of material by needles or the like.

Consequently the stations downstream of the second conveyor like hemming and/or sewing equipment can be run continuously at maximum efficiency and their capacity can be fully utilised.

In a preferred further development the second conveyor consists of conveyor belts arranged in transport direction outside the alignment of the clamping device and press the edge of the piece of material against the bearing area which is a component of each of the two conveyors.

In a preferred arrangement the clamping device consists of pairs of clamping bars.

It is also preferred that the clamping device and the conveyor can be brought together in such a way that the piece of textile, held at its edges by the clamping device, can be transferred to the conveyor at its edge, whereby the transferred piece of material joins a another piece previously transferred by the conveyor gapless or almost gapless.

It is further advantageous for the transfer process if the bearing surface is a flat supporting plate or a supporting table.

It is sometimes also possible that the bearing surface is in each instance a further continuous conveyor.

In this case the bearing surface can be an endless conveyor, whose one side serves as opposite surface for the continuous conveyor with the conveying element and runs in the transport direction in the same direction and at the same speed.

A method for the transport of pieces of material is set out in Claim 16.

The invention is explained in more detail below with reference to the drawings.

Drawings:

Figure 1	side view of a device as per invention
Figure 2	side view of the same device rotated 90° C around the vertical axis
Figures 3 and 4	side view and top view of a detail
Figure 5	side view of a detail of Fig. 2

The drawings show the essential elements of a device for the transportation of individual pieces of textile 1' separated from a continuous length 1.

The device essentially consists of a discontinuously operating conveyor, by means of which the continuous length of textile 1 can be taken from a storage point (not shown) and whereby the free end of the length to be separated may be held under tension. Further the device consists of a second continuously operating conveyor whose transport plane runs parallel to the transport plane of the first conveyor and which has means for holding the separated piece of textile 1'. The transport direction of the first conveyor is shown at 5. The transport direction of the second conveyor is as shown in Figure 1 orthogonal to the drawing plane and shown in Figure 2 with the arrow 6. The transport planes of both conveyors run mutually parallel and interspaced above each other. The transport direction 5 of the first conveyor runs parallel to the longitudinal extension of the continuous material 1, while the transport direction of the second conveyor is oriented at right angles to the longitudinal direction of the continuous material.

The first conveyor consists of a slide bar 7 for the continuous length of textile 1 and a gripper 4, whereby the gripper 4 as indicated by the movement arrow 8 can be moved towards and away from the slide bar 7.

Between the slide bar 7 and gripper 4 there is provision near the slide bar 7 for a separating device 9 by means of which the continuous length of textile can be separated in order to produce a single piece of textile 1'. In the embodiment the separating device 9 is shown as a pair of scissors. This may be manually operated scissors or a motor-driven rotary disc knife or even a pneumatic or motor-driven cutting bar or the like. After cutting or simultaneously, the single piece of textile 1' is released by the slide bar 7 and the gripper 4 and shifted by a transfer device from the plane of the first conveyor into the plane of the second conveyor.

The transfer device consists of a clamping device 2. The clamping device 2 consists of two pairs of clamping bars, one of which is positioned above the continuous length of textile 1 and the other underneath it, whereby the single piece of textile is held in place by closure of the clamping bars of the clamping device 2. Subsequently the clamping bars of the clamping device with the piece of textile 1' are moved from the position shown with a dotted line in Figure 1 to the position shown with solid lines. The clamping bars of the clamping device 2 hold the single piece of textile at a slight distance from its lateral edges so that the edges, which are at right angles to the transport direction 5, project sideways from the clamping jaws.

The clamping device 2 is moved into the plane of the second conveyor. Then the clamping device 2 with the clamping bars is moved towards the second conveyor and the second conveyor is moved in the opposite direction towards the clamping device so that these two elements are brought close together. The second conveyor consists of endless conveyor belts 3. The bottom run of the conveyor belts is braced on an opposite surface 10. As the clamping device 2 is arranged beside the conveyor belts 3 of the second conveyor as shown particularly in Figure 1, the two elements 2 and 3 can be brought close together in an overlapping position without mutual interference or contact. Through this arrangement it is possible to bring the piece of textile 1' held by the clamping device 2 so close to the conveyor belts 3 of the second conveyor that the leading edge in feed direction of the piece of textile 1' can be practically abutted to the piece already taken off by the second conveyor.

As soon as the conveyor belts 3 of the second conveyor have gripped and taken off the

piece of textile, the second conveyor 3 can again be moved away in conveying direction from the clamping device 2 and likewise the clamping device 2 away from the second conveyor, whereby the clamping device 2 simultaneously or subsequently is moved into the plane of the first conveyor so that it can receive the continuous length of textile 1 and separate and transfer a further piece of textile. The movement possibilities of the elements 2 and 3 and their individual parts are indicated by arrow 11.

The bearing surface 10 on which each conveyor belt 3 is braced, is extended against the transport direction (in Fig. 2 to the left) so that the edge of the piece of textile can already be placed on this contact surface by the clamping device 2 before the conveyor belt 3 actually engages the edge of the piece.

Both the take-off gripper (4) and the clamping device 2 may be pneumatically actuated. The conveyor belts 3 can be driven synchronously, e.g. by electromotors or the like.

Figure 5 shows the adjustment possibility of the complete second conveyor with the endless conveying element 3. The bottom run of the conveying element 3 is guided parallel to the supporting area (10) and rotates around deviating rollers and/or drive rollers.

For taking over of a piece of material 1' the complete unit with running conveying element 3 is moved left in the drawing, e.g. by means of a rigidly mounted (at 27) linear drive (28). After or during the takeover of the piece of material 1' the unit is moved back to the base position shown in Figure 5. The conveying element 3 runs continuously at constant speed.

The device shown makes a method possible whereby the separated piece of textile is each time moved up gapless or almost gapless to the piece already being carried by the second conveyor so that despatch of the single pieces in extremely close order to downstream processing stations is possible.

The drawings 3 and 4 show a core element of the device for transporting a flat piece of material, e.g. a piece of material from a continuous length of textile. The piece 1' is transferred parallel to the bearing surface 10 by the first conveyor to the second conveyor. The second conveyor consists of a continuous conveyor 12 with two conveying elements, at a mutual and adjustable interspaceat right angles to the conveying direction 6, in the form of conveyor belts 3. Each conveyor belt 3 is matched with a

striplike bearing surface 10 extending parallel to the conveying direction 6 on which the relevant conveying element (3) is braced when during its rotation, edge portions of the piece of material 1' are inserted between the conveying element (3) and the bearing surface (10). The bearing surface 10 may also be formed by the top run of a continuous conveyor arranged under the piece of material 1'. Each of the two conveying elements (3) is so guided and diverted that a buffer loop is formed and that the deviation area 14 which extends against the transport direction 6 can be moved from a base position in which the area 14 is shifted right in Figure 3, to a transfer position parallel to the transport direction 6 shown by way of example in Figure 3 while continuing to engage the conveying element. A further conveying element 15 of a second continuous conveyor is arranged close by parallel to the conveying elements (3) of the first conveyor.

The conveying elements 15 of the second continuous conveyor are driven in the same transport direction and at the same speed as the conveying elements (3) of the first continuous conveyor. The deviation area 14 of the conveying elements (3) of the first continuous conveyor can therefore be moved back in the transport direction (6) from the transfer position to the base position so that the piece of material 1' is transported in transport direction by the conveying elements 15 of the second continuous conveyor and the deviation area 14 braced on the piece of material is moved back to the base position together with the corresponding part of the conveying element 3.

The continuous conveyors are in both cases (elements 3 and 15) of the endless belt type. In particular the conveying elements in the form of toothed belts feature gear rollers acting as deviating rollers 16, 17, 18 and 19 and guide rollers 20, 21 and 22 and also as drive rollers 23 driven by an electromotor drive 24. The conveying elements of the first and second conveying device which are close to each other (elements 3 and 15 respectively and on the right and left side respectively viewed in transport direction) are driven by the same drive 24. The two pairs of conveying devices are driven synchronously and in the same direction by two electromotors 24. Each conveying element 3 of the first continuous conveyor is at its deviation end 14 which is opposite to the transport direction diverted around a first deviating roller 16. The top run of the conveying element running up to this first deviating roller is diverted twice around a second 25 and third deviating roller 18, creating a loop, whereby the first deviating roller 16 and the second deviating roller 25 which is closest to it in relation to the incoming top run, can be jointly moved from the base position opposite to the transport direction 6 to the transfer position and back to the base position as indicated by arrow 26. The bottom run descending in the transport direction is always braced on the bearing surface 10. For the detection of the position of the piece of material 1' there may be installed near the

deviating roller 16 and/or near the deviating roller 17 a light barrier for instance, by means of which the edge of the piece of material 1' can be detected and actuators for the adjustment mechanism of the deviation area 14 can be switched on.

During the adjustment of the deviation area 14 against the transport direction 6 the corresponding deviating rollers turn more quickly, while the actual belt (3) rotates at constant speed. During return to the base position the belt 3 continues to rotate at constant speed.

The whole system preferably operates at a belt speed of ca. 15 to 20 m a minute.

The invention is not limited to the embodiment, but is variable in many ways within the scope of the disclosure.

All new disclosed individual and combined characteristics disclosed in the description and/or drawing are considered an essential part of the invention.

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Patent Claims:

1. Device for the transportation of a flat piece of material, for instance a piece cut off a continuous length of textile, paper, cardboard, plastic, sheet metal or foil, whereby the piece of material is transferred in horizontal orientation from a first conveying device to a second conveying device, **characterised by the fact that** the second conveying device essentially consists of a first continuous conveying device of the band, belt or chain type (12) with at least one conveying element (3) or two conveying elements (3) mutually interspaced at right angles to the conveying direction, whereby a bearing surface (10) running parallel to the conveying direction (6) is matched with each conveying element (3) and on which bearing surface (10) the relevant conveying element (3) is braced when during its rotation, parts of the piece of material (1') are inserted between the conveying element (3) and the bearing surface (10), **that either** each conveying element (3) of the first continuous conveyor (12) is diverted at its deviation end (14) which is opposite to the transport direction, around a first deviating roller (16), and the top run of the conveying element (3) running towards this first deviating roller (16) is diverted twice around a second and third deviating roller (25, 18) creating a

loop (13), whereby the first deviating roller (16) and the second deviating roller (25) which is closest to it in relation to the incoming top run, can be jointly moved against the transport direction from the base position to a transfer position and back to the base position, whereby the bottom run running in transport direction is braced on the bearing surface (10), so that each conveying element (3) is diverted and guided in such a way that a buffer loop is formed and that the deviation area (14) of the conveying element (3) which area extends against the transport direction, can be moved parallel to the transport direction during the conveying element's (3) rotation, from a base position against the transport direction (6) to a transfer position while continuing to engage the conveying element (3), **or that** each conveying element (3) with deviating roller and drive roller can be moved against the transport direction of the conveyor element (3) during the rotation of the conveying element (3) in transport direction (6), parallel to the transport direction (6) from a base position to a transfer position and subsequently back to the base position by means of a rigidly mounted linear drive (28).

2. Device as per Claim 1, **characterised by the fact that** parallel to the conveying elements (3) of the first continuous conveyor (12) there is arranged close to them a further conveying element (15) of a second continuous conveyor, which conveying elements (15) of the second continuous conveyor are driven in the same transport direction and at the same speed as the conveying elements (3) of the first continuous conveyor (12) and **that** the deviation area (14) of the conveying elements (3) of the first continuous conveyor

(12) can therefore be moved back in transport direction from the transfer position into the base position, **that** the piece of material (1') is transported by the conveying elements (15) of the second continuous conveyor in the conveying direction (6) and **that** the deviation area (14) is braced on the piece of material (1') and is engaged by the piece of material (1') back to the base position at transport speed.

3. Device as per one of the Claims 1 or 2, **characterised by the fact that** both continuous conveyors are of the endless type.

4. Device as per one of the Claims 1 to 3, **characterised by the fact that** both continuous conveyors have toothed belts as conveying elements (3, 15)

which engage with gear rollers acting as deviating rollers and drive rollers.

5. Device as per one of the Claims 1 to 4, **characterised by the fact that** the adjacent conveying elements (3, 15) of the first and the second continuous conveyor in each case share a common drive (24), whereby the drives of the two pairs of conveying elements are driven synchronously and in the same direction.

6. Device as per one of the Claims 1 to 5, **characterised by the fact that** the actuator for driving the conveying element or the deviation area (14) extending opposite to the conveying direction, is coupled to or controlled by a device by means of which the presence of a piece of material (1') as well as the required position of the piece of material (1') under the bottom run of the conveying element (3) of the first continuous conveyor (12) can be detected.

7. Device as per one of the Claims 1 to 6, **characterised by the fact that** the actuator for driving the conveying element (3) or the deviation area (14) extending opposite to the conveying direction (6), is coupled to or controlled by a device by means of which the position of a piece of material (1') under the bottom run of the

conveying element (15) of the second continuous conveyor can be detected.

8. Device as per one of the Claims 1 to 7, **characterised by the fact that** the device consists of the first discontinuously operating conveyor, by means of which a continuous length of textile (1) can be removed from a storage point and the free end of the continuous length to be cut is held, as well as of the second continuously operating conveyor, whose transport plane runs parallel to and underneath the transport plane of the first conveyor and which conveyor has means for holding the separated piece of textile, whereby the transport direction of the first conveyor runs parallel to the longitudinal direction of the continuous material and the transport direction of the second conveyor at right angles to the longitudinal direction of the continuous material, whereby the first conveyor consists of a slide bar (7) for the length of textile and a gripper (4), whereby the gripper (4) can be adjusted towards and away from the slide bar (7) and there is between the slide bar (7) and gripper (4) a separating device (9) by means of which the continuous length of textile (1) can be separated into individual pieces of textile and whereby, after or at the same time as the separating cut and release by the first conveyor

the separated piece of textile can be transferred and delivered by a transfer device from the plane of the first conveyor into the plane of the second conveyor and **that** the transfer device consists of a clamping device (2), by means of which the edges of the separated piece of textile, which edges are parallel to the transport direction of the second conveyor (3) can be clamped at a distance from its edges in the plane of the first conveyor and can be moved by the clamping device (2) to the plane of the second conveyor (3) and **that** the clamping device (2) can be adjusted in the plane of the second conveyor (3) towards and away from it and also **that** the second conveyor (3) is adjustable towards and away from the clamping device (2) so that the free edges of the piece of textile can be brought into engagement with the second conveyor (3).

9. Device as per Claim 8, **characterised by the fact that** the second conveyor (3) consists of conveyor belts which are positioned in the direction of transport outside the alignment plane covered by the movement of the clamping device (2) and which press the edge of the piece of textile against the bearing surface (10) which

is a component of the two conveyors.

10. Device as per Claim 8 or 9, **characterised by the fact that** the clamping device (2) consists of pairs of clamping bars.

11. Device as per Claims 8 to 10, **characterised by the fact that** the clamping device (2) and the conveyor (3) can be brought together in such a way that the piece of textile, held at its edges by the clamping device (2), can be transferred to the conveyor (3), whereby the transferred piece of textile adjoins a piece of textile previously transferred to the conveyor (3).

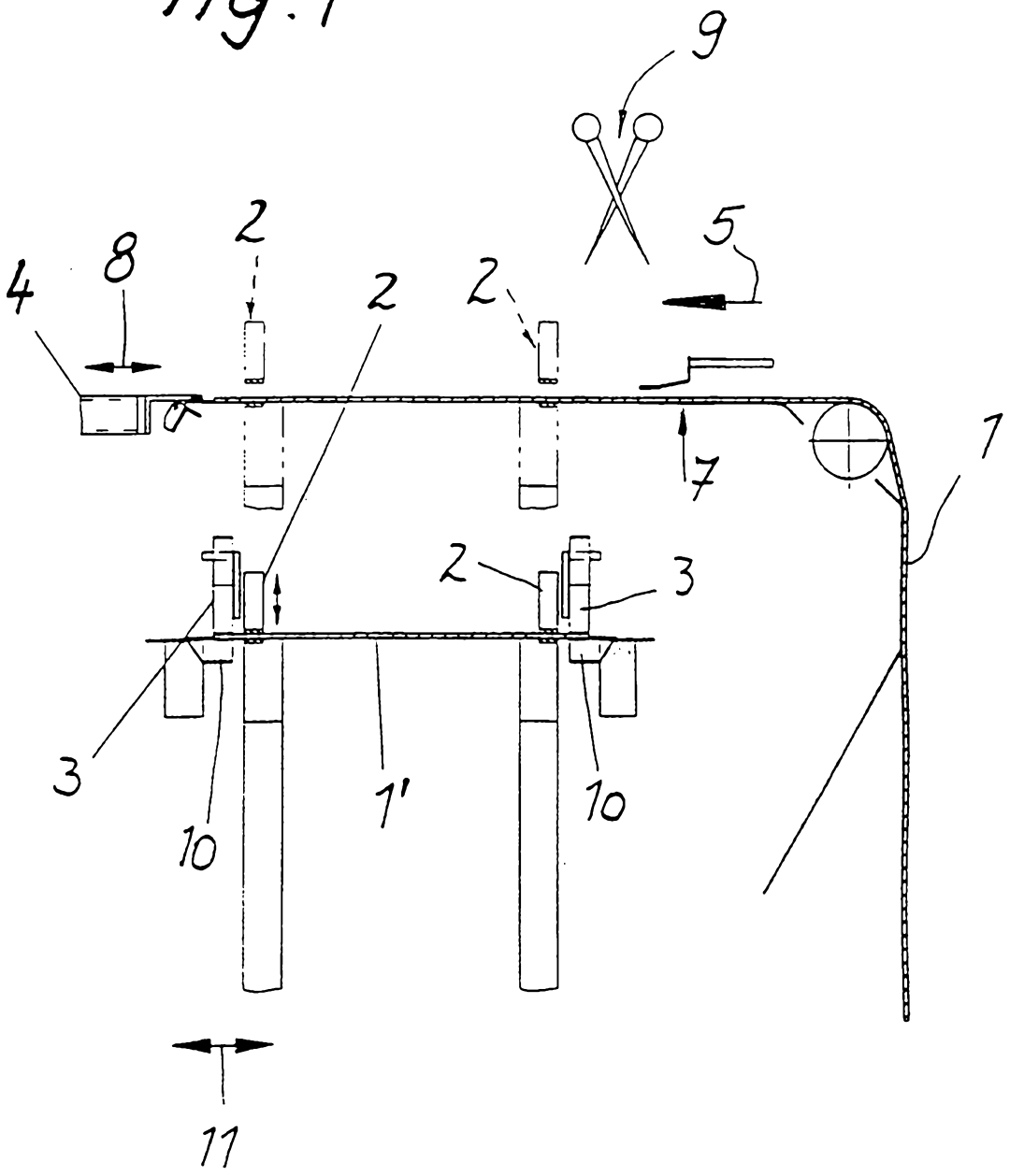
12. Device as per one of the Claims 1 to 11, **characterised by the fact that** the bearing surface (10) is in the form of a flat supporting plate or a supporting table.

13. Device as per one of the Claims 1 to 11, **characterised by the fact that** the bearing surface (10) is in each case in the form of a further continuous conveyor.

14. Method for the transport of pieces of material, whereby by means of a first discontinuously operating conveyor a continuous length of material is held at the free end thereof and after being cut into single pieces, is transferred to a second continuously operating conveyor whose transport plane runs parallel to, horizontal with and underneath the transport plane of the first conveyor. Following transfer of each single piece, the second conveyor transports it, whereby the transport direction of the first conveyor runs parallel to the longitudinal direction of the continuous material and the transport direction of the second conveyor at right angles to the longitudinal direction of the continuous material, whereby the length of material enters the first transport plane, is held in a required position, a piece is then cut off the continuous length, is held at the edges by a clamping device either before separation or simultaneously and is transferred to the second, lower transport plane, then is pushed in transport direction towards the second conveyor, which conveyor is adjusted against the direction of push so that the separated piece of material, its transverse edge facing the second conveyor, is carried away adjoining a piece of material carried by the second conveyor, whereby after

transfer of the piece of material, the second conveyor as it carries the piece of material, advances to its base position in transport direction and the clamping device releases the piece of material and returns to its base position against the transport direction and is moved back into the first, upper transport plane.

Fig. 1



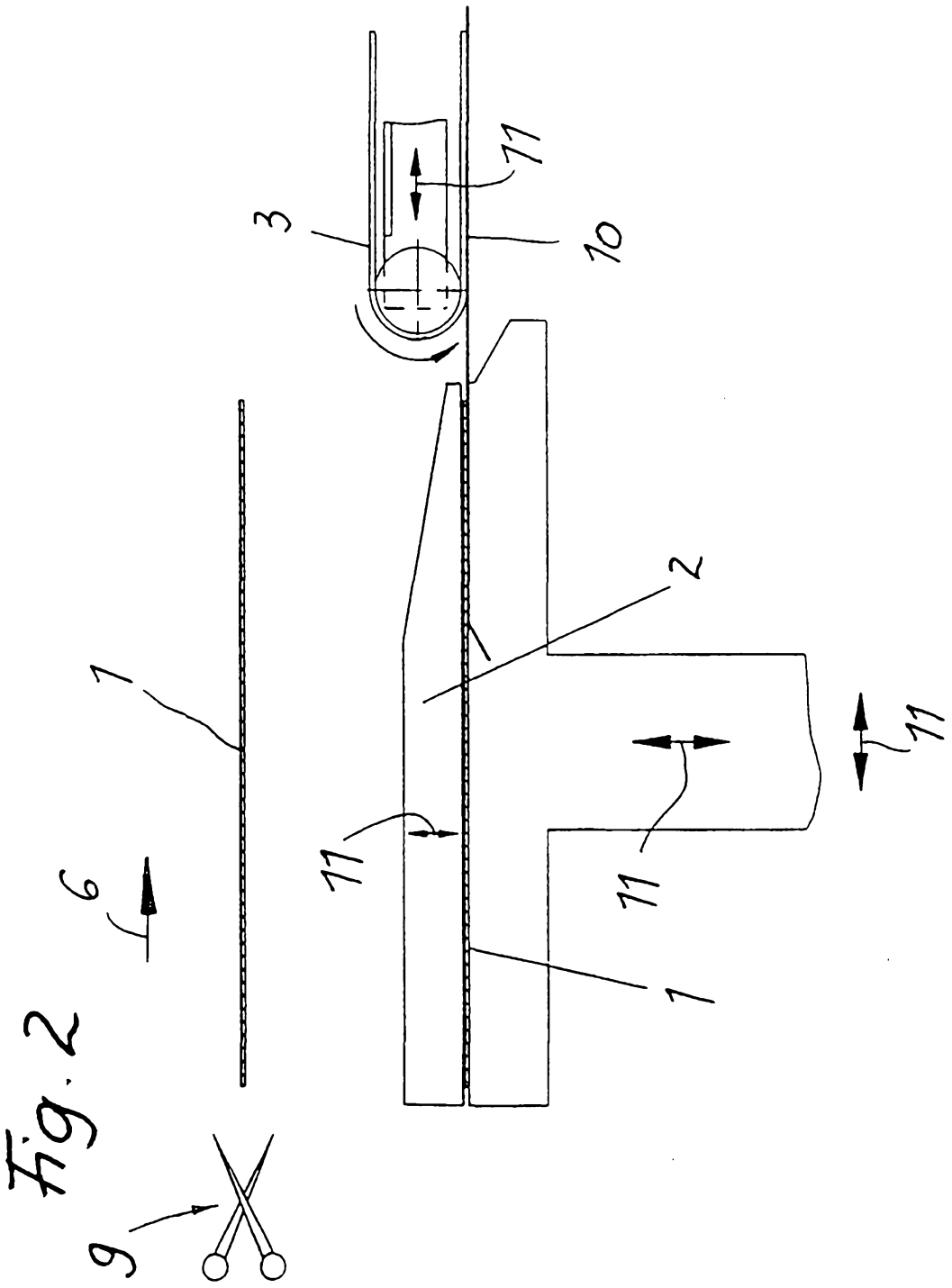


Fig. 2

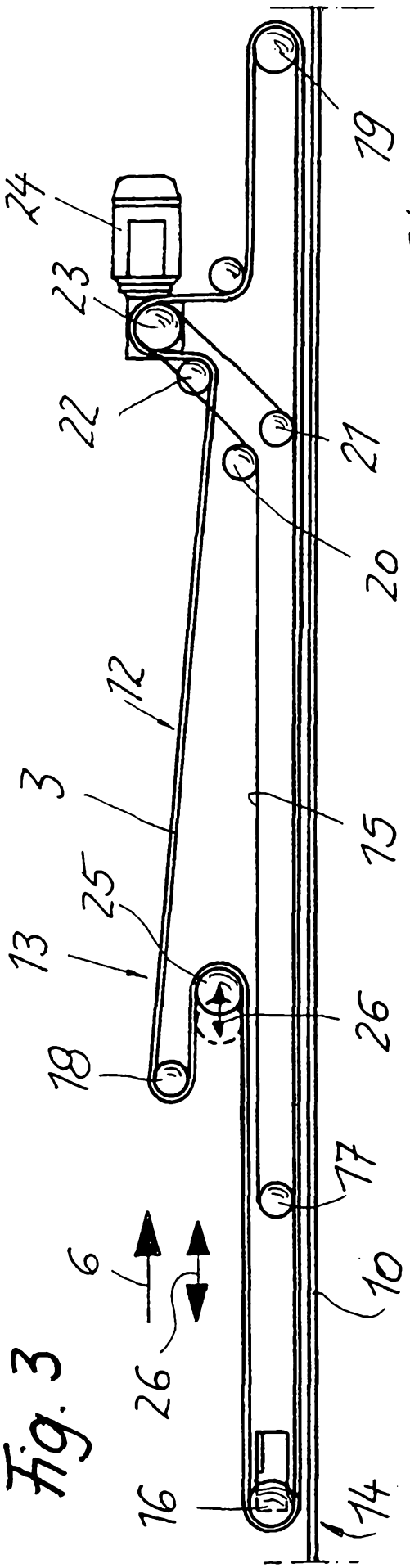

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Fig. 3

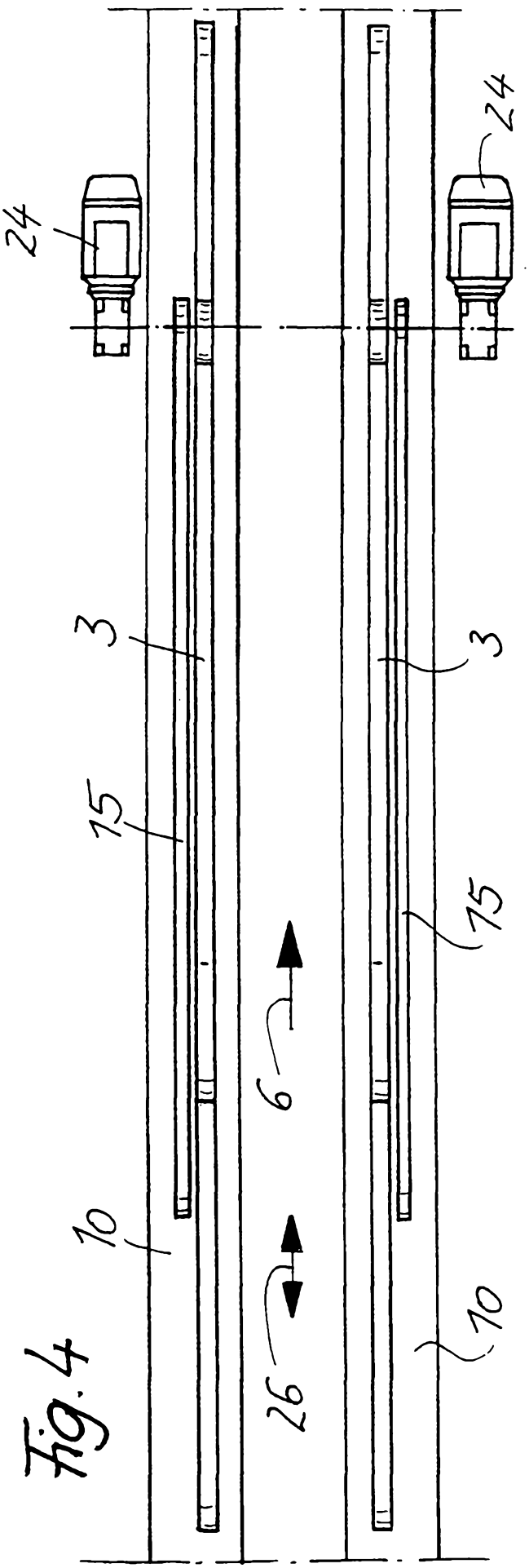
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Fig. 4

Fig. 5