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**Equipment for transporting textile articles hanging on supports, preferably
items of clothing**

5 The invention relates to a device for transporting textile articles hanging on carriers according to the preamble of Claim 1.

10 Above all in commercial laundries, textile articles such as, for example, items of clothing, are transported along conveying paths hanging on carriers. The textile articles are, for example, transported to laundry treatment apparatuses, transported away from laundry treatment apparatuses and/or transported from one laundry machine to the next.

15 Known devices of this type have at least one support section and at least one conveying section associated with it. The carriers with and/or without the textile articles hang on the support section. Multiple entrainment elements spaced apart from one another are arranged on the conveying section. The conveying section has a drive. The entrainment elements can be moved further in the transport direction by the conveying section, wherein these carriers can be moved along the support section in the transport direction by a targeted coupling of the entrainment elements
20 to specific carriers.

The respective conveying section normally has a conveyor chain on which the entrainment elements are pivotably mounted in order to be coupled in a targeted manner to specific carriers. The entrainment elements run beyond the front carriers
25 on storage sections with a plurality of carriers which follow on closely from one another.

30 CN 208814034 U, which has the features cited in the preamble of Claim 1, discloses a conveying system for, for example, items of clothing, which has a conveying section to which consecutive entrainment elements are assigned which move the carriers accommodating the items of clothing further in the transport direction. The conveying section has, for each entrainment element, a fastening angle with two support pins which extend through bores of the respective entrainment element.

The respective entrainment element is secured on the two support pins assigned to it by a latching element pushed onto the ends of the two support pins holding each entrainment element.

5 WO 99/59903 A1 discloses a conveying section formed as a conveyor chain. The conveyor chain has a plurality of chain links connected to one another in an articulated manner. The connection of these chain links is performed in a latching manner.

10 The object on which the invention is based is to create a device for transporting textile articles, preferably items of clothing, hanging on carriers, which is easy to assemble.

A device to achieve the above-mentioned object has the features of Claim 1. A
15 simple connection of the entrainment elements to the at least one conveying section is ensured by the latching fastening of the entrainment elements to support pins of the respective conveying section. For this purpose, a latching connection between the entrainment elements and the conveying section is established by attaching each entrainment element to at least one support pin on the conveying section in the
20 direction transverse to the longitudinal centre axis of the at least one support pin. As a result of the latching transversely directed attachment of the entrainment elements to their support pins, the entrainment elements are fixed in a force-fitting and/or form-fitting manner on their support pins.

25 The entrainment element is preferably provided with at least one slot open on one side. The at least one slot which is open on one side has an initial portion proceeding from the open end which is narrower in comparison to the diameter of the support pin assigned thereto. In particular, the initial region of the slot is only a little bit narrower than the diameter of the support pin assigned thereto, and
30 indeed in such a manner that respective slot can be pushed under elastic enlargement in a latching manner on the support pin of the conveying section assigned thereto. As a result of this, simple, tool-free connection of the respective entrainment element to the support pin of the conveying section assigned thereto is

possible, wherein, as a result of the narrower initial portion, the respective entrainment element remains reliably retained on the support pin assigned to it during operation of the device without being able to detach automatically from the support pin.

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One advantageous possible further development of each entrainment element or its entrainment element member, in particular of the single or the respective slot therein, provides that an end region of the at least one slot, which adjoins the narrower initial portion and is closed on the end side, is wider than the initial portion. The end region preferably has such a larger width than the initial portion which is slightly larger than the diameter of the support pin assigned thereto. As a result of this, each entrainment element, in the case of a slot located with its end region on the support pin, is rotatable about the support pin and/or is displaceable on the support pin in the region of the end region of the respective slot. As a result of this, the respective entrainment element can be rotated freely, preferably substantially without play, about its at least one support pin on the conveyor section. If – which is preferred – each entrainment element is held and/or mounted on the conveyor section with two spaced apart parallel support pins, the displaceability of at least one slot with respect to the support pin of the conveyor section assigned thereto also enables a free pivoting capacity of the respective entrainment element, wherein, however, the pivot angle is restricted by the two slots, attached in each case to a support pin, of the entrainment element.

In the case of one device, it is provided that the preferably only spring for pivoting the respective entrainment element in one direction, preferably in the direction of the support section and/or the carriers hanging thereon, is formed to be insertable into in each case a laterally open slot in the respective entrainment element or entrainment element member. Additionally, the respective spring is fixed in the slot by a thermal deformation of at least one accumulation of material and/or at least one bead in the region of the slot, preferably at the periphery of the slot, in a form-fitting and/or force-fitting manner. As a result of this, a simple, but reliably fixed connection of the spring to the respective entrainment element or its entrainment element member is ensured.

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- It is preferably provided that the respective spring is designed as a leaf spring. The leaf spring possesses an angled end region at an end inserted into the slot of the entrainment element. This end region prevents the end region of the leaf spring located in the slot of the entrainment element from being extracted from the slot.
- 5 As a result of this, the leaf spring is secured with its end region assigned to the respective entrainment element in the longitudinal and transverse direction of the slot which receives the leaf spring with its end region in and on the entrainment element, in particular its entrainment element member.
- 10 In the case of one advantageous configuration of the device, it is provided that the entrainment elements and/or their entrainment element members are formed by a plurality of, preferably two, entrainment element parts and these entrainment element parts are connected by at least one damping seam. The damping seam preferably serves to damp sound and/or vibrations. As a result of the damping seam,
- 15 a separation of the respective entrainment element arises from an acoustic and vibrational perspective, as a result of which noise, above all vibrations and/or sound, is/are not transmitted from the respective conveying section to the support section assigned thereto and vice versa. As a result of this, the development of noise of the device is effectively reduced.
- 20 It is preferably provided that each entrainment element part has a thickness which corresponds to the thickness of the entrainment element. Both entrainment element parts are of approximately the same thickness. As a result of this, the respective damping seam can extend over the entire thickness of the entrainment element. This
- 25 leads to a reliable connection of the entrainment element parts by the damping seam. Moreover, a damping seam which is continuous over the entire thickness of the respective entrainment element and its entrainment element parts can have as large a contact surface as possible to the entrainment element parts to be connected.
- 30 As a result of the entrainment element parts of identical thickness and the at least one seam of identical thickness, the covering faces, preferably front and rear sides of the entrainment element member, are flush with the surface.

In the case of one advantageous configuration of the device, it is provided that on both sides the peripheries of the entrainment element parts that delimit the, or the respective, damping seam have such a, preferably identical, profile which leads to a continuous, uninterrupted gap between adjacent entrainment element parts that can be filled by the respective damping seam. The cross-section of the damping seam is preferably identical over its entire length. The entrainment element parts can thus be easily and effectively connected in that the gap between the adjacent peripheries of the entrainment element parts is filled, preferably completely filled, by the damping seam by the material of the at least one damping seam. As a result of the at least one damping seam, the entrainment element parts retain at least the majority of their independence from an acoustic perspective after their connection by virtue of the fact that the entrainment element parts are indeed mechanically connected by the at least one damping seam, but acoustically remains at least largely separate.

It is furthermore preferably provided that the preferably only damping seam and/or the gap extend continuously between adjacent peripheries of two entrainment element parts of the respective entrainment element. As a result of this, not only the entrainment element parts are separated from one another by the gap between these; rather the at least one damping seam for connecting the entrainment element parts extends in an uninterrupted manner and continuously over the entire length of the gap. Because the gap extends continuously between two different, preferably opposite peripheries and/or corners of the entrainment element, the respective damping seam, preferably only damping seam, obtains a maximum possible length.

One advantageous possible further development of the device provides that the or the respective, preferably only, seam of the respective entrainment element member and/or the gap to be filled by the respective seam between the entrainment member parts has a serpentine, labyrinthian and/or meandering profile. This leads to an increase in the length of the respective damping seam.

Another advantageous configuration possibility of the device provides that the at least one damping seam is formed from an elastomer. The elastomer preferably

involves such an elastomer which is softer than the material of the entrainment element parts. The entrainment element parts are preferably likewise formed from a thermoplastics material, in particular polyamide.

5 The elastomer of the at least one damping seal preferably involves a thermoplastic elastomer. As a result of this, it is possible not only to produce the entrainment element parts of the entrainment element in the injection-moulding process, but also in the so-called two-component injection mould, to produce the at least one damping seam in the injection-moulding process, wherein the connection of the
10 entrainment element parts arises during the production of the at least one damping seam in the injection-moulding process. This connection is produced in that the at least one gap between the entrainment element parts to be connected is filled after the previously performed spraying of the entrainment element parts during subsequent spraying of the at least one damping seam by the material made
15 flowable for injection moulding by thermal heating of the at least one damping seam, and, during cooling and hardening of the material of the at least one damping seam, the material thereof sticks to the peripheral faces of both entrainment element parts which delimit the gap. As a result of this, a connection of the entrainment element parts which has comparable reliability and endurance to a welded
20 connection by the at least one damping seam is produced.

A preferred exemplary embodiment of a device according to the invention is explained in greater detail below on the basis of the drawing. In this drawing:

25 Fig. 1 shows a plan view of several working stations which are interlinked by the conveying path of the device,

Fig. 2 shows a plan view of a conveying path portion of the conveying path of Fig. 1,
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Fig. 3 shows a side view of a part of the conveying path portion of Fig. 2, and

Fig. 4 shows a view of one side of the entrainment element in the case of a leaf

spring, connected to the entrainment element member, of the entrainment element.

Figs. 1 and 2 show by way of example a possible conveying path 10 of the device. Textile articles hanging on carriers 11, and indeed preferably so-called shaped parts such as, for example, items of clothing, items of work clothing or the like can be transported along the conveying path 10 to different working stations, processing stations and/or treatment stations. Figs. 1 and 2 only depict the carriers 11 which can be formed, for example, as retractable and extendable transport hangers having hanger arms and/or trouser clamps. Textile articles, such as above all items of clothing, hung on the carriers 11, in particular transport hangers, are not depicted in the figures.

In the case of the exemplary embodiment of Fig. 1, the conveying path 10 has three conveying path portions 13, 14 and 15. The invention is not restricted to the conveying path 10 shown in Fig. 1, in particular its profile. The conveying path 10 can have any desired profiles. The conveying path 10 can also have more or fewer than three conveying path portions 13 to 15.

In the case of the exemplary embodiment of Fig. 1, the first conveying path portion 13 of the conveying path 10 serves to transport items of clothing to be treated to a tunnel finisher 16 for smoothing out the items of clothing. Items of clothing smoothed out in the tunnel finisher 16 are transported along the second conveying path portion 14 from the tunnel finisher 16 to a folding machine 17. Before or at the start of the folding machine 17, the finished items of clothing are preferably automatically removed from the respective carrier 11. The empty carriers 11 are then transported along the third conveying portion 15 from the folding machine 17 to a loading station 18, where they are once again loaded with (other) items of clothing to be treated. In the exemplary embodiment show, this is performed by a person 19 or possibly several people. The carriers 11 can potentially also be automatically loaded with items of clothing at the loading station 18. The carriers 11 once again loaded with items of clothing to be treated are supplied one after the other from the loading station 18 to the start of the conveying path portion 13.

Both carriers 11 loaded with items of clothing and empty carriers 11 are guided along the conveying path 10 shown by way of example in Fig. 1 in transport direction 12 in a circuit. In the representation of Fig. 1, transport of the carriers 11 is performed in a clockwise direction. The transport direction 12 consequently also runs in a clockwise direction. The invention is, however, not restricted to this.

The invention is also suitable for conveying paths which do not form a closed circuit and also for conveying paths which do not link tunnel finishers 16 and folding machines 17 to one another, but rather to transport items of clothing assigned to carriers 11 or other textile articles to at least one other laundry machine and/or away from it or link any other desired laundry machines, also more than two laundry machines, to one another.

The conveying path 10 is formed from at least one continuous conveyor. In the exemplary embodiment shown in which the conveying path 10 has three conveying path portions 13, 14 and 15, each conveying path portion 13, 14 and 15 is formed from a separate, preferably independent, continuous conveyor.

The or the respective continuous conveyor of the conveying path 10 or the conveying path portions 13, 14 and 15 has a support section 20 and a conveying section 21 extending parallel with a small distance thereover. Each support section 20 and each conveying section 21 run parallel over one another along the transport direction 12 along the conveying path 10 or its conveying path portions 13, 14 and 15. Both the support section 20 and the conveying section 21 are arranged in a stationary manner under a ceiling of the laundry and/or on columns fastened on the floor of the laundry. Here, the profile of the respective support section 20 and of the conveying section 21 assigned thereto corresponds to the profile of the conveying path 10 or the conveying path portions 13, 14 and 15.

The respective support section 20 can in the simplest case be formed as a tube with a preferably round cross-section, but can also have a profiled cross-section which does not necessarily have to be formed to be tubular. It is decisive that the respective support section 20 is formed or profiled so that the carriers 11, and

indeed both loaded and unloaded carriers 11, can slide along the respective preferably horizontally running support section 20 with their upper hooks 22. For this purpose, the carriers 11 are hung or suspended with the hooks 22 on the respective support section 20. In this manner, the carriers 11 hang down from their hooks 22 on the respective support section 20, wherein the items of clothing to be treated and transported further in turn hang down from the respective carrier 11.

The respective conveying section 21 of the conveying path 10 or of the respective conveying path portion 13, 14 and 15 has a stationary sliding section 23 and a circumferentially drivable conveyor chain 24. The conveyor chain 24 runs along on or in the sliding section 23 and is guided by the sliding section 23. In the exemplary embodiment shown, the conveyor chain 24 is formed as a roller chain with chain links 26 connected in an articulated manner by pins and sleeves mounted thereon. In the exemplary embodiment shown, the conveyor chain 24 is aligned so that their pins 25 which connect the individual chain links 26 run perpendicularly. As a result of this, the chain links 26 of the conveyor chain 24 are assigned in a stationary manner to the sliding section 23.

Entrainment elements 27 which follow on from one another at equal distances are connected to the conveyor chain 24 of the conveying section 21. All of the entrainment elements 27 are of identical form. Each entrainment element 27 is movably connected by means of a fastening angle 28 to a chain link 26 of the conveyor chain 24. In the exemplary embodiment shown, not every chain link 26 supports an entrainment element 27, rather only every fifth chain link 26. The invention should, however, not be restricted to this. The distance between identical entrainment elements 27 following on from one another can amount to a larger or also smaller number of chain links 26.

Each fastening angle 28 is fastened with a shorter limb under the relevant chain link 26 of the conveyor chain 24, for example, with both parallel spaced apart pins 25 of the respective chain link 26. A respective entrainment element 27 arranged below the conveyor chain 24 is movably connected to a longer limb, extending under the conveyor chain 24, of each fastening angle. For this purpose, in the

exemplary embodiment shown, the longer limb, oriented in transport direction 12 and located in a vertical plane, of each fastening angle 28 has two spaced apart support pins 29. Both support pins 29 protrude from the same side of the longer limb of the fastening angle 28, and indeed running in a horizontally directed manner and transversely to the transport direction 12. Alternatively, the fastening angles 28 can also be formed to be U-shaped in cross-section with two parallel perpendicular longer limbs, between which a rear part of the respective entrainment element 27 is fastened. The two support pins 29 for the respective entrainment element 27 then extend in a horizontally directed manner from a longer vertical limb to the adjacent longer limb spaced apart therefrom.

Each of the identically formed entrainment elements 27 has an entrainment element member 30 composed of two entrainment element parts 31 and 32 as well as a damping seam 33 connecting these. Furthermore, the entrainment element 27 shown here also has a spring 34. The entrainment element 27 can also be composed of more than two entrainment element parts 31 and 32. The entrainment element 27 can likewise have more than one damping seam 33 which connects the entrainment element parts. The entrainment element 27 can also have several, possibly different springs.

The entrainment element member 30 is formed in the manner of an upright panel. As a result, the entrainment element member 30 has lateral faces which lie in two parallel, upright planes and which form a front side 45 and a rear side 36. In the case of the entrainment element member 30 shown, opposite recesses 37 in the front side 35 and in the rear side 36 are provided for the purposes of reducing material. The entrainment element member 30 is surrounded by a periphery 38 which, in the exemplary embodiment shown, is interrupted by gaps 39 and slots 40, 41 and 42.

The slot 40 in the entrainment element member 30 is assigned to a tapered end region of the entrainment element 27. The slot 40 is open towards the underside of the entrainment element member 30 by virtue of the fact that it interrupts the periphery 38 of the entrainment element member 30 here. The longitudinal slot 40 runs, in the case of the entrainment element 27 shown here, slightly with respect to

a vertical, and indeed by 10° to 30° , in particular 15° . This inclination is such that the slot 40 runs outwardly from its open end to the closed, approximately semi-circular end, i.e. towards the tapered end of the entrainment element 27. The slot 40 has a width which is slightly larger than the diameter of the hooks 22 of the carriers 11. As a result of this, the slot 40 of the respective entrainment element 27 can be coupled to the respective carrier 11 by virtue of the fact that the hook 22 of the respective carrier 11 engages in the slot 40 or the slot 40 partially engages around the hook 22 from above (Fig. 3). The plane of the carrier 11 runs transversely to the plane of the respective entrainment element 27.

The two parallel and slightly spaced apart slots 41 and 42 are arranged at the end region of the entrainment element 27 opposite the slot 40. Both slots 41 and 42 proceed from an upper, preferably rectilinear and/or horizontal portion of the circumferential periphery 38, interrupted by the slots 40, 41 and 42, of the entrainment element member 30. The slots 41 and 42 are assigned to the entrainment element part 31 in contrast to the slot 40 which is assigned to the entrainment element part 32.

Both slots 41, 42 run parallel to one another at an angle of approximately 45° . The angle can be up to 30° larger or smaller. The inclination of the slots 41 und 42 is such that their closed ends point in the direction of the adjacent vertical portion of the periphery 38. The slots 41 and 42 have an upper initial portion 45 proceeding from the approximately horizontal portion of the periphery 38 of the entrainment element member 30. The initial portion 45 of each slot 41 and 42 equally has a width which is slightly smaller than the diameter of the support pins 29, with which the respective entrainment element 27 is fastened to a chain link 26 of the conveyor chain 24 to include the fastening angle 28. The width of each initial portion 45 is smaller than the identical diameters of the support pin 29 in such a manner that each entrainment element 29 can be inserted in a latching manner onto the two identical support pins 29 assigned to it with elastic widening of the slots 41 and 42. As a result of this, a simple, tool-free fastening of the respective entrainment element 27 with its slots 41 and 42 on the two support pins 29 to the fastening angle 28 of the respective chain link 26 of the conveyor chain 21 is possible. By inserting

the entrainment elements 27 with the slots 41 and 42 onto the support pins 29, the entrainment elements 27 are fixed on the support pins 29 so that they can no longer become automatically detached therefrom.

5 An end portion which follows the initial portion 45 of each slot 41 and 42 has in each case a cylindrical enlargement 46. The cylindrical enlargement 46 of the front slot 41 is larger than that of the rear slot 42. The cylindrical enlargement 46 is only so much larger than the diameter of the support pin 29 assigned to it that the respective entrainment element 27 is rotatable about the support pin 29 in the
10 cylindrical enlargement 46 at the closed end of the slot 42 about the longitudinal centre axis of the support pin 29. In contrast, the cylindrical enlargement 46 at the end of the front slot 41 is larger than the cylindrical enlargement 46 at the end of the slot 42. The cylindrical enlargement 46 at the end of the slot 41 is preferably 30% to 50% larger than the cylindrical enlargement 46 at the end of the slot 42. As
15 a result of this, the respective entrainment element 27 can be pivoted to a limited extent about the support pin 29 in the rear slot 42, wherein the larger cylindrical enlargement 46 at the end of the foremost slot 41 restricts the pivoting path or pivoting angle of the respective entrainment element 27 about the support pin 29 in the rear slot 42.

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The two entrainment element parts 31 and 32 are of the same width, but have different base surfaces. The base surfaces of the entrainment element parts 31 and 32 are divided so that adjacent inner peripheries 43, 44 which are not involved in the formation of the outer circumferential periphery 38 of the entrainment element
25 member 30 do not bear against one another in the case of assembled entrainment element parts 31, 32, but rather are evenly spaced apart from one another for the formation of the gap 39 between the entrainment element parts 31, 32. The gap 39 is thus delimited by the inner periphery 43 of the entrainment element part 31 and by the inner periphery 44 of the entrainment element part 32. The gap 39 has a
30 width which preferably corresponds to the largest thickness of the entrainment element member 30. It is, however, conceivable that the width of the gap 39 is up to 40%, in particular up to 25%, larger or smaller than the maximum thickness of the entrainment element member 30.

The gap 39 runs continuously between different portions of the outer periphery 39 of the entrainment element member 30. In the exemplary embodiment shown, the gap 39 proceeds from an upper side, preferably straight portion of the periphery 38 of the entrainment element member 30 and ends in an also preferably straight lateral
5 portion of the periphery 38 of the entrainment element member 30. This preferably approximately perpendicular or slightly oblique portion of the periphery 38 is located on that side of the entrainment element member 30 to which the two spaced apart slots 40 and 41 are assigned.

10 In the case of the entrainment element 27 shown here, the gap 39 does not run on the shortest path from one portion to the other portion of the periphery 38 of the entrainment element member 30, but rather in a serpentine and/or meandering manner. As a result of this, the length of the gap 39 in the entrainment element member 30 is increased. In the case of the entrainment element 27 shown, the gap
15 39 has a serpentine part with an approximately S-shape proceeding from the upper and approximately horizontally directed portion of the periphery 38 of the entrainment element member 30. This is adjoined by a straight region of the gap 39 which is slightly bent in the exemplary embodiment shown and which ends in an approximately perpendicular lateral portion of the periphery 38 of the entrainment
20 element member 30. This slightly angled elongated part of the gap 39 is approximately the same length as the S-shaped initial part or region of the gap 39.

The two assembled entrainment element members 30 are, in the exemplary embodiment shown, connected by the only damping seam 33. This connection is
25 performed in the manner of a butt weld seam. This butt weld seam is formed in the manner of an I-seam which completely or at least largely fills the gap 39 and extends continuously from the flat front side 35 to the flat rear side 36 of the entrainment element member 30. The entrainment element member 30 which is permanently in one piece is created after the connection of the entrainment element
30 parts 31 and 32 by the damping seam 33, wherein the damping seam 33 in the region of the gap 39 contributes to the formation of a part of the front side 35 and the rear side 36 of the entrainment element member 30.

The entrainment element member 30 of each entrainment element 27 is formed from two different materials, in particular plastic or elastomer. The entrainment element parts 31 and 32 are likewise formed from a thermoplastics material, in particular polyamide. In contrast, the damping seam 33 is formed from an elastomer which is softer than the material of the entrainment element parts 31 and 32. The material of the damping seam 33 preferably involves a thermoplastic elastomer. As a result of this, the entrainment element parts 31 and 32 and the damping seam 33 can likewise be produced in the injection-moulding process, and indeed preferably by two-component injection moulding.

As a result of the formation of the damping seam 33 from an elastomer, in particular thermoplastic elastomer, this is softer than the plastic from which the entrainment element parts 31, 32 are formed. As a result of this, the damping seam 33 has a sound- and/or vibration-damping effect. This has the result that the two entrainment element parts 31 and 32 are vibrationally and/or acoustically separated from one another.

The complete entrainment element 27 is represented in Fig. 4 with a view of the rear side 36. The spring 34 of the entrainment element 27 is shown in this figure – as also in Fig. 3. The represented spring 27 involves a leaf spring which is pre-bent in an approximately U-shape. The width of the leaf spring which forms the spring 34 is slightly smaller than the width or thickness of the entrainment elements 27. At least one periphery of the spring 34 is slightly set back with respect to the front side 35 of the entrainment element member 30, preferably also with respect to the rear side 36.

As a result of its U-shaped pre-bending, the spring 34 formed as a leaf spring has two limbs 47 and 48 which are connected in one piece by a semicircular web 49. The two limbs 47 and 48 of unequal length do not run entirely parallel to one another; on the contrary, they diverge slightly towards their free ends. The longer limb 48 and the web 49 of the spring 34 formed as a leaf spring are located outside the entrainment element member 30 of the entrainment element 27. In contrast, the shorter limb 47 of the spring 34 is located in a groove 50 which is laterally open

only towards the rear side 36 of the entrainment element member 30. Towards the front side 34 of the entrainment element member 30, the groove 50 is closed, hence this involves a blind hole-like groove 50. The groove 50 is open towards a vertical end-side portion of the periphery 38 of the entrainment element member 30. The groove 50 is provided with a blind hole-like enlargement 51 at its opposite end which lies inside the entrainment element part 31. Two preferably identical blind holes 52 are located between this enlargement 51 and the open end of the groove 50. The blind holes 52 are spaced apart from one another and are also spaced apart from the enlargement 51 and the end of the groove 50 that is open at the face side.

Small material accumulations which do not (yet) constrict the groove 50 which is open (at the rear side) towards the rear side 36 of the entrainment element member 30 are provided between two adjacent blind holes 52 and one blind hole 52 and the enlargement 51 on both sides next to the groove 50. In the exemplary embodiment shown, the material accumulations involve preferably four point-like projections 54 which protrude with respect to the rear side 36 of the entrainment element part 31 of the entrainment element member 30.

After the transversely directed pushing in of the spring 34 performed by the rear side 36 of the entrainment element member 30 with its shorter limb 47 into the groove 50, the spring 34 is secured by lateral movement out of the groove 50 which is open towards the rear side 36 by a softening and subsequent plastic deformation of the projections 54. This can be performed, for example, by ultrasonic welding. In this manner, the groove 50 is closed off in portions. In order to secure the spring 34 designed as a leaf spring against longitudinal extraction from the groove 50, the shorter limb 47, which is pushed laterally into the groove 50, of the spring 34 has an angled end 55 which is supported in the enlargement 51.

The long limb 48, located above the entrainment element member 30 outside thereof, of the spring 34 formed as a leaf spring runs in a slightly anti-parallel manner to the portion, overlapping it, of the periphery 38 of the entrainment element member 30, and indeed so that, in the case of a spring 34 not under load, the limb 48 increases in size towards its end at a distance to the periphery 38. A

short end region proceeding from the free end of the longer limb 48 is slightly bent in the direction of the periphery 38 of the entrainment element member 30 so that this end region 56 again comes closer to the periphery 38 of the entrainment element member 30 towards the free end of the longer limb 48. As a result of this, a hooking of the end or end region 56 of the longer limb 48, exposed above the entrainment element member 30, of the spring 34 on the sliding section 23 of the conveying section 21 is prevented.

The mode of operation of the device, in particular of the entrainment elements 27 thereof, is explained below with reference to Fig. 3:

This figure shows parts of a portion of the conveying path 10, for example, of the conveying path section 15. The entrainment elements 27 fastened to the conveyor chain 24 are moved further by the circumferentially driven conveyor chain 24 in transport direction 12.

Multiple carriers 11 which follow on closely from one another and can be loaded or unloaded are located at the start of the conveying path 10. The entrainment elements 27 moved further in transport direction 12, i.e. from left to right in relation to the depiction of Fig. 3, slide over the carriers 11 which follow on closely from one another into a state pivoted upwards about the support pin 29 in the slot 42 under pretensioning of the spring 34 formed as a leaf spring beyond the hooks 22 of the first carriers 11. The entrainment elements 27 are supported on the hooks 22 with a lower part, proceeding from their hook-like slot 40, of the periphery 38 of the entrainment element members 30. This lower part of the periphery 38 of the entrainment element members 30 forms a lifting slope 57 below the entrainment elements 27 which leads to the pivoting up of the entrainment elements 27 and permits a sliding movement of the entrainment elements 27 over the hooks 22 hanging on the support section 20 of the carriers 11 which follow on closely from one another. In this pivoted-up state, the hook-like slot 40 at the rear end of the entrainment elements 23 can still not come into engagement with the hook 22 of the carriers which follow on closely from one another.

If an entrainment element 27 is moved beyond the carriers 11 which follow on

closely from one another and the lifting slope 57 is no longer supported on any hook 22 of a carrier 11, the relevant entrainment element 27 is pivoted downwards by the pretensioned spring 34 with its rear-side end having the hook-like slot 40. As a result of this, the hook-like slot 40 on the rear side of the relevant entrainment element 27 can hook on hooks 2 of the last carrier 11 as seen in transport direction 12 of the package of carriers 11 which follow on closely from one another. This carrier 11 is now carried along by the entrainment element 27 hooked with it in transport direction 12 along the conveying path 10 and as a result is transported further.

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A store 58 with in turn carriers 11 which follow on closely from one another is located at the end of the conveying section portion 15 of the conveying section 10. Here, the relevant entrainment element 27 becomes detached again from the hook 22 thereof as soon as the carrier 11 has been transported with or without an item of clothing hanging thereon up to in front of the last of the carriers 11 which follow on closely from one another in the store 58. As a result of this, the further transport of this carrier 11 in transport direction 12 is terminated. This release or separation of the entrainment element 27 from the hook 22 is performed by pivoting up the entrainment element 27 about the support pin 29 in the slot 42 at the front end of the entrainment element 27 in the clockwise direction.

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The end of the entrainment element 27 having the rear slot 40 is moved upwards and the spring 34 is pretensioned again. This pivoting movement of the entrainment element is generated by a sliding along of the lifting slope 57 of the oblique lower portion of the periphery 38 of the entrainment element member 30 over the hook 22 of the subsequent carrier 12 as seen in transport direction 12 in the store 58. In the pivoted up state, the entrainment element 27 then slides beyond all the hooks 22 of the carriers 12 in the store 58 until the relevant entrainment element 27 is coupled again with its hook-like slot 40 to the last carrier 11 as seen in transport direction 12 in the store 58.

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List of reference signs:

	10	Conveying path
	11	Carrier
5	12	Transport direction
	13	Conveying path portion
	14	Conveying path portion
	15	Conveying path portion
	16	Tunnel finisher
10	17	Folding machine
	18	Loading station
	19	Person
	20	Support section
	21	Conveying section
15	22	Hook
	23	Sliding section
	24	Conveyor chain
	25	Pin
	26	Chain link
20	27	Entrainment element
	28	Fastening angle
	29	Support pin
	30	Entrainment element member
	31	Entrainment element part
25	32	Entrainment element part
	33	Damping seam
	34	Spring
	35	Front side
	36	Rear side
30	37	Recess
	38	Periphery
	39	Gap
	40	Slot

	41	Slot
	42	Slot
	43	Inner periphery
	44	Inner periphery
5	45	Initial portion
	46	Cylindrical enlargement
	47	Limb
	48	Limb
	49	Web
10	50	Groove
	51	Enlargement
	52	Blind hole
	54	Projection
	55	Angled end
15	56	End region
	57	Lifting slope
	58	Store

Patentkrav

1. Anordning til transport af tekstilgenstande, foretrukket beklædningsstykker, hængende på bæreelementer (11), med en fremføringsstrækning (10), som har mindst et bæreafsnit (20), som bæreelementerne (11) kan bevæges langs i fremføringsstrækningens (10) transportretning (12), og mindst et fremføringsafsnit (21), der kan drives i transportretningen (12), og med medbringere (27), som er anbragt med afstand til hinanden på fremføringsafsnittet (21) og er lejret på mindst en bærebolt (29), der er forbundet med fremføringsafsnittet (21), kendetegnet ved, at hver medbringer (27) kan fastgøres låsende på mindst en bærebolt (29), hvor medbringernes (27) låsende forbindelse med fremføringsafsnittet (21) sker ved påsætning af hver medbringer (27) på mindst en bærebolt (29) på fremføringsafsnittet (21) i retningen på tværs af længdemidteraksen af den mindst ene bærebolt (29).
2. Anordning ifølge krav 1, kendetegnet ved, at medbringerne (27) har mindst en slids (41, 42), der er åben i den ene side, og som i et startafsnit (45), der udgår fra den åbne ende, er smallere i forhold til den tilknyttede bærebolt (29), sådan at medbringeren (27) kan sættes låsende på den mindst ene bærebolt (29).
3. Anordning ifølge krav 2, kendetegnet ved, at et endeafsnit af den mindst ene slids (41, 42), som grænser op til startafsnittene (45) og er lukket for enden, er bredere end startafsnittet (45), foretrukket at det respektive endeafsnit er udformet som en cylindrisk udvidelse (46), og/eller den respektive medbringer (27), når en bærebolt (29) befinder sig i det udvidede endeområde af den mindst ene slids (41, 42), kan drejes og/eller skubbes frit omkring denne.
4. Anordning ifølge krav 3, kendetegnet ved, at hver medbringer (27) har to slidser (41, 42) anbragt ved siden af hinanden med lille afstand til hinanden, som hver har tilknyttet sin egen bærebolt (29), hvor begge bærebolte (29) er tilknyttet eller er forbundet med det samme kædeled (26) på en fremføringskæde (24) på fremføringsafsnittet (21), og/eller den respektive medbringer (27), som kan drejes om en af bæreboltene (39) og kan drejes og/eller bevæges svingende om den anden bærebolt (29), foretrukket kan bevæges begrænset svingende.
5. Anordning ifølge et af kravene 1 til 4, kendetegnet ved, at hver medbringer (27) har mindst en fjeder (34) til at bevæge medbringeren (27) mod et

bæreelement (11), og at fjederen (34) kan sættes ind i en rille (50) på den respektive medbringer (27), som er åben i siden, og fjederen (34) er form- og/eller kraftsluttende fikseret i rillen (50) ved plastisk deformation af mindst en materialeophobning (53).

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6. Anordning ifølge krav 5, kendetegnet ved, at fjederen (34) er udformet som en bladfjeder, som har en vinklet ende (55), med hvilken bladfjederen kan indsættes tværgående i slidsen, som er åben på en flad side af medbringeren (27), eller den åbne rille (50), hvor bladfjederen i længderetningen via sin vinklede ende (55) er form- og/eller kraftsluttende sikret mod at blive trukket ud af slidsen eller rillen (50) i længderetningen.

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7. Anordning ifølge et af de foregående krav, kendetegnet ved, at medbringerne (27) har medbringerlegemer (30), som er udformet af flere medbringerdele (31, 32) forbundet af mindst en dæmpende søm (33).

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8. Anordning ifølge krav 7, kendetegnet ved, at medbringerdelene (31, 32) og den dæmpende søm (33), som forbinder disse, har omtrent samme tykkelse til dannelse af en flugtende forside (35) og bagside (36) af medbringerlegemet (30).

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9. Anordning ifølge krav 7 eller 8, kendetegnet ved, at på begge sider de korresponderende inderkanter (43, 44) af medbringerdelene (31, 32), der begrænser sømmen eller den respektive dæmpende søm (33), har et sådan forløb, foretrukket af samme type, at der mellem inderkanterne (43, 44) af medbringerdelene (31, 32), der begrænser den respektive dæmpende søm (33), opstår en gennemgående spalte (39) over hele længden af den respektive dæmpende søm (33), foretrukket af samme størrelse og/eller af samme bredde.

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10. Anordning ifølge krav 9, kendetegnet ved, at den foretrukket eneste dæmpende søm (33) og/eller den foretrukket eneste spalte (39) strækker sig gennemgående mellem de overforliggende, korresponderende inderkanter (43, 44) af medbringerdelene (31, 32) af det respektive medbringerlegeme (30).

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11. Anordning ifølge krav 9 eller 10, kendetegnet ved, at den foretrukket eneste dæmpende søm (33) på det respektive medbringerlegeme (30) har et bølget

og/eller mæanderformet forløb.

- 5 12. Anordning ifølge et af kravene 9 til 11, kendetegnet ved, at den mindst ene spalte (39) mellem medbringerlegemets (30) medbringerdele (31, 32) helt eller i det mindste for størstedelens vedkommende er fyldt med den dæmpende søms (33) materiale.
- 10 13. Anordning ifølge et af kravene 7 til 12, kendetegnet ved, at den mindst ene dæmpende søm (33) er dannet af en elastomer, som er blødere end medbringerdelenes (31, 32) materiale, foretrukket medbringerdelene (31, 32) på samme vis er dannet af termoplastisk kunststof, særligt polyamid.

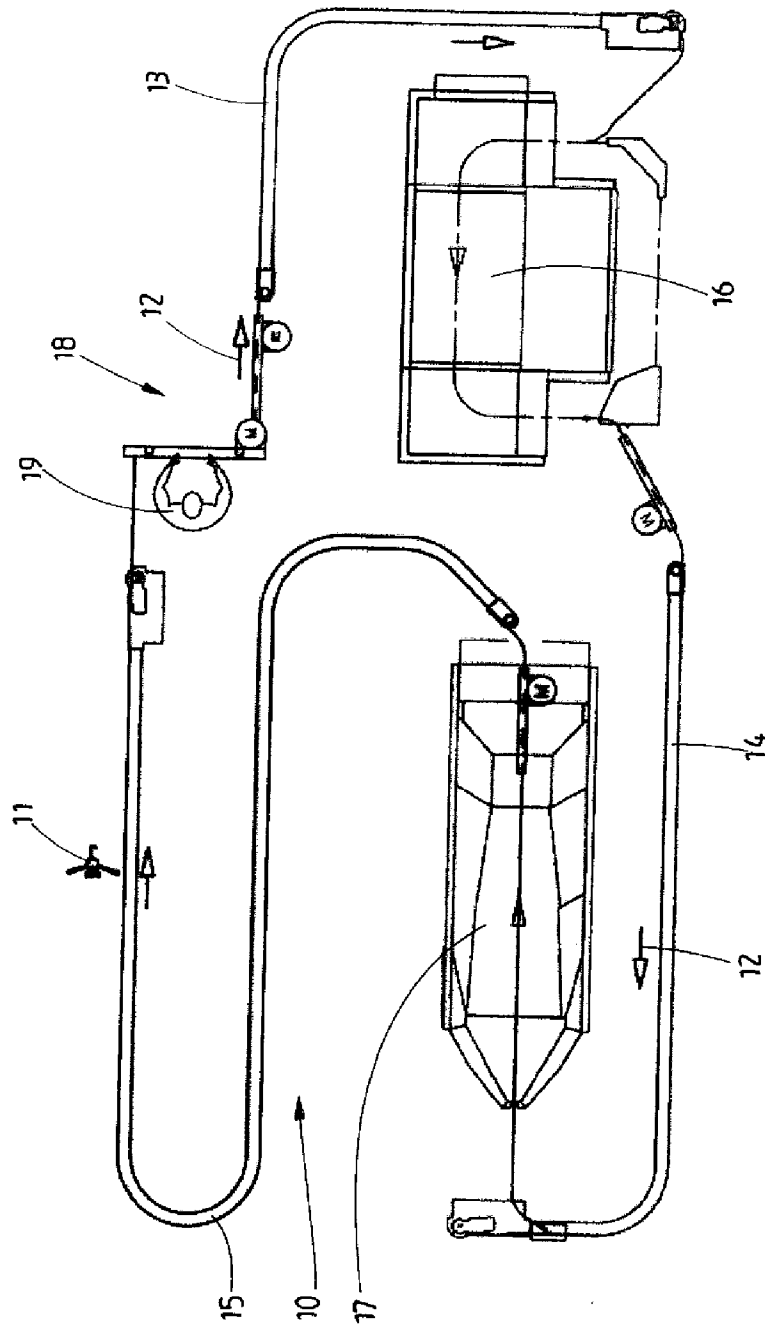


Fig. 1

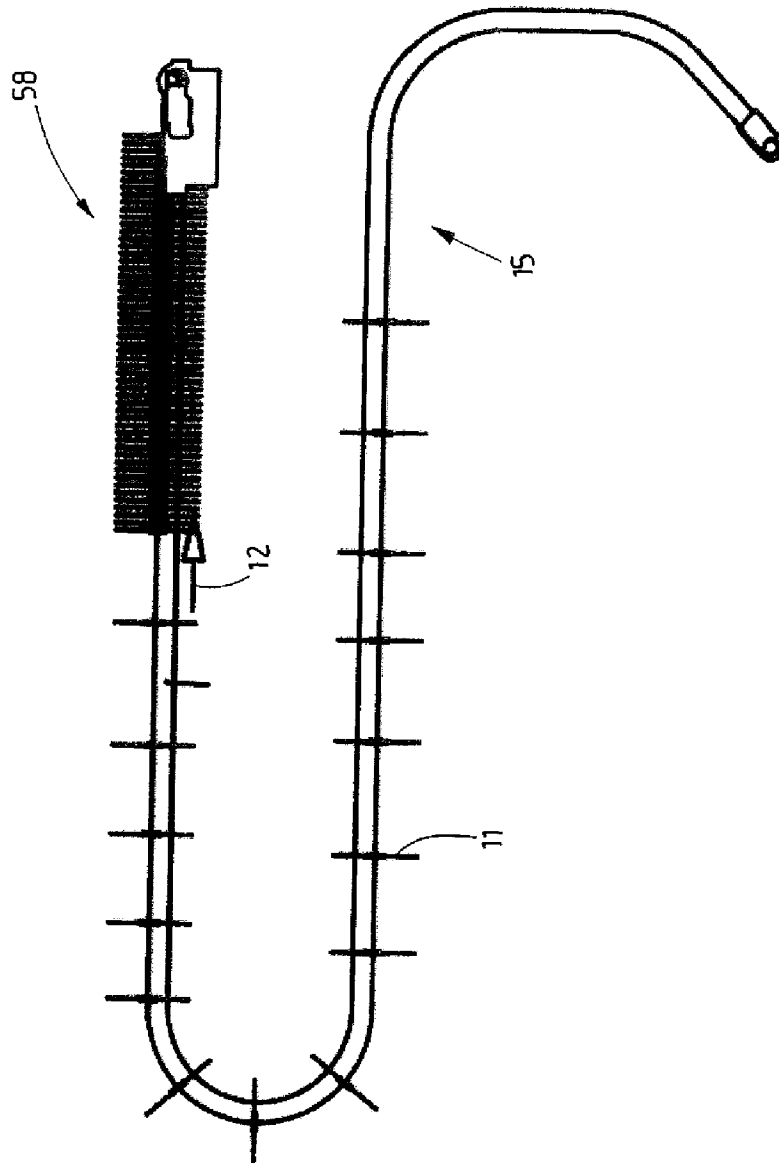


Fig. 2

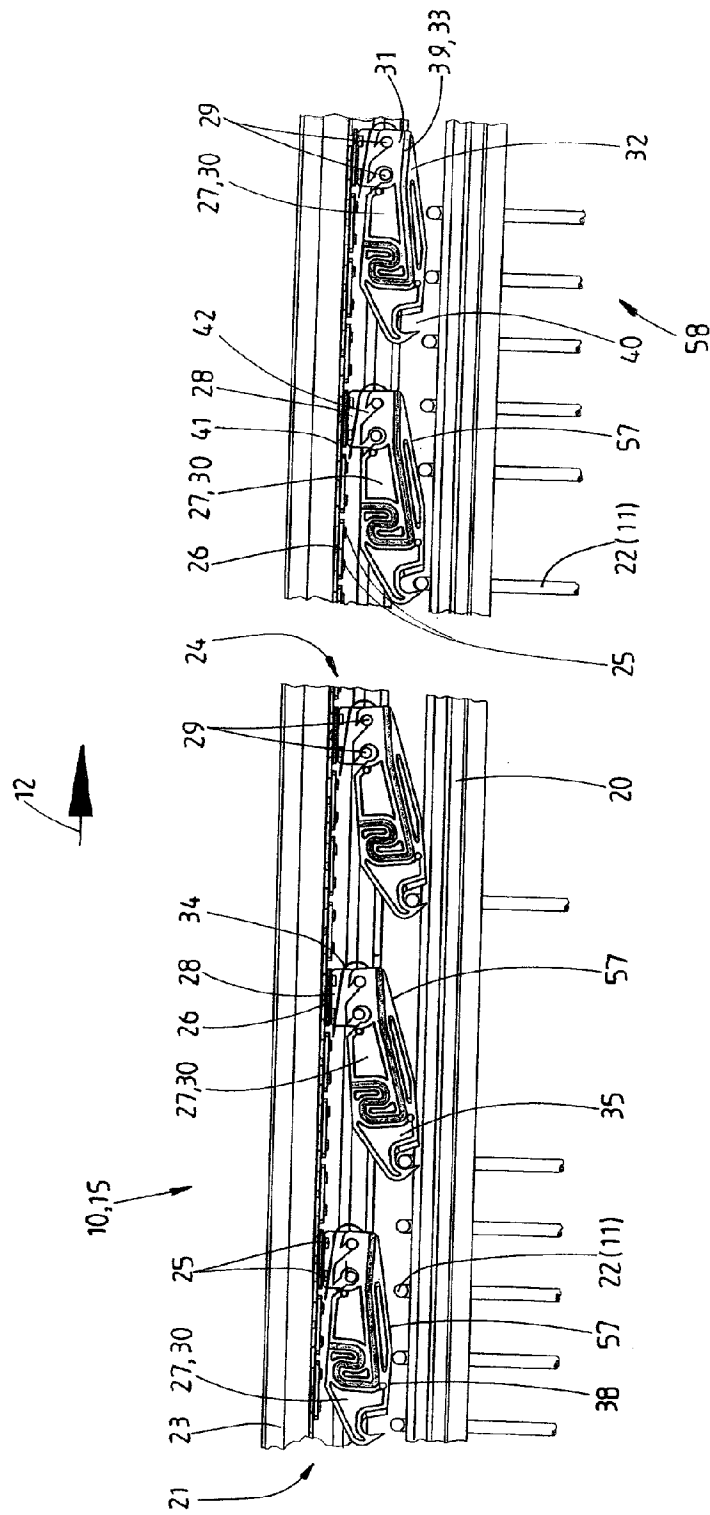


Fig. 3

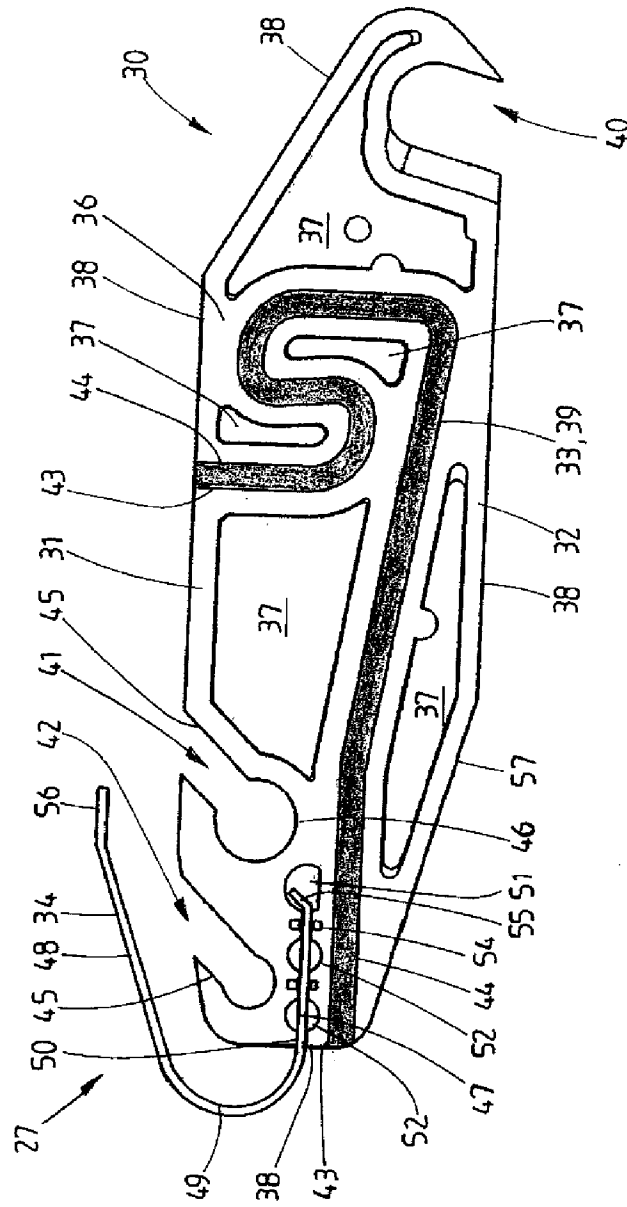


Fig. 4