Abstract: A conveying system, comprising an endless conveying mat (4) circulating between return elements, having an upper surface provided with longitudinal grooves (5) for carrying products, wherein a top run extending between the return elements is at least partly supported, at a lower surface of the conveyor mat, on a guide track, and wherein a bottom run extending between the return elements is at least partly supported, at the upper surface of the conveying mat, on a return guide such that, during use, the top run is guided via the guide track in a conveying direction oriented in longitudinal direction of the mat, and the bottom run is guided back via the return guide (11), against the conveying direction, wherein the return guide is provided with elements reaching into the grooves.
Title: Return guide II

The invention relates to a conveying system provided with a return guide according to the preamble of claim 1.

Such a conveying system is generally known. The conveying mat is then typically designed as a modular conveying mat.

The grooves in the conveying mat can cooperate with fingers of a transferring device which facilitates placing products onto the conveying surface or removing products from the conveying surface.

In some cases, guiding the bottom run of the conveying mat back via a return guide can be problematic, for instance when the conveying mat is relatively long and wide as is the case with a pasteurizer. Further, the grooves may present contamination problems, for instance contaminations becoming wedged in the grooves, contaminations rooting in the bottom of closed grooves or via contaminations entering via open grooves and acting on other parts of the conveying mat. Such contaminations may render the conveying system less hygienic, or, in case of abrasive contaminations, may even damage the system.

In order to prevent these drawbacks, the invention provides a conveying system according to claim 1. Providing the return guide with elements reaching into the grooves allows for removal of contaminations, and the bottom run can be guided in an elegant manner.

If desired, the conveying mat is supported on the return guide via the elements.

When the elements reaching into the grooves comprise ribs, whose ridge parts extend in the longitudinal direction of the conveying mat, a very good guiding function can be realized.

By providing the ridge parts with a curvature proceeding in longitudinal direction, inserting when ridge parts and grooves cooperate can be simplified.
When the conveying mat is provided with roller elements cooperating, in the top run, with the guide track, the roller elements can cooperate, in the bottom run, with the return guide. In particular the elements reaching into the grooves can drivingly engage the roller elements. This is particularly elegant as in the bottom run, the roller elements can be rotated in a rotational direction which is opposite to the rotational direction in the top run. Any contaminations having become rooted in the top run in the bearings of the roller elements can then be forced out again through the opposite rotation in the bottom run.

The invention also relates to a return guide for a conveying system, to a guide shoe or guide wheel for a conveying system, and to a method for guiding back, by means of a return guide, a bottom run of a conveying mat provided with grooves, against a conveying direction.

Further advantageous embodiments of the invention are represented in the subclaims.

The invention will be described in further detail on the basis of an exemplary embodiment represented in a drawing. In the drawing:

Fig. 1 shows a schematic, perspective view of a conveying system according to the invention;

Fig. 2 shows a schematic side view of the return guide of the conveying system of Fig. 1;
Fig. 3 shows a detail of a guide shoe of the return guide of Fig. 2;
Fig. 4 shows a detail of a bottom run of the conveying system of Fig. 1 with a modular conveying mat provided with longitudinal grooves and roller elements, wherein elements of the guide shoe of the return guide reaching into the grooves drivingly engage the roller elements of the conveying mat.

The Figures are merely schematic representations of a preferred embodiment of the invention, and are given by means of a non-limitative
exemplary embodiment. In the Figures, identical or corresponding parts are indicated with identical reference numerals.

With reference to Figs. 1 - 4, a conveying system 1 is shown, comprising an endless conveying mat 4 circulating between return elements 2, 3, having an upper surface 6 provided with longitudinal grooves 5 for carrying products. A top run 7 extending between the return elements 2, 3 is at least partly supported, at a lower surface 8 of the conveyor mat 8, on a guide track 9. A bottom run 10 extending between the return elements 2, 3 is at least partly supported, at the upper surface 6 of the conveyor mat 4, on a return guide 11. During use, the top run 7 is guided via the guide track 9 in a conveying direction P oriented in a longitudinal direction of the conveying mat 4, and the bottom run is guided back via the return guide 11, against the conveying direction P.

The return guide 11 is provided with elements 12 reaching into the grooves 5. The conveying mat 4 is supported on the return guide 11 via the elements 12. Here, the elements 12 reaching into the grooves 5 comprise ribs, whose ridge parts 13 extend in longitudinal direction of the conveying mat 4. The ridge parts 13 are provided with a curvature proceeding in longitudinal direction. In this example, a multiple number of ribs 12 spaced apart at mutual intervals transversely to the conveying direction are included on a central carrier 14. Here, the central carrier 14 forms a fixedly disposed guide shoe, but could also form a rotatably disposed guide wheel.

In conveying direction P, several central carriers 14 are spaced apart at mutual intervals as supports for the bottom run 10.

The conveying mat 4 is provided with roller elements 15 which cooperate, in the top run 7, by way of support, with the guide track 9 for reducing the frictional resistance of the conveyor mat 4 over the guide track. In the bottom run 10, the roller elements 15 cooperate with the return guide. Here, the elements 12 reaching into the grooves 5 drivingly engage the outer circumference of the roller elements 15.
Thus, with the return guide 11, a bottom run 10 provided with grooves 5 of a conveying mat 4 is guided back against the conveying direction P, while the bottom run 10 is guided along elements 12 reaching into the grooves 5. The elements 12 remove wedged-in dirt from the open grooves 5 and guide the bottom run 10 of the conveyor mat 4 in longitudinal direction. The elements 12 reaching into the grooves drivingly engage the roller elements 15 of the conveying mat 4.

It will be clear to the skilled person that the invention is not limited to the embodiment represented here, but that many variants are possible. Such variants will be clear to the skilled person, and are understood to be within the range of the invention as set forth in the following claims.
Claims

1. A conveying system, comprising an endless conveying mat circulating between return elements, having an upper surface provided with longitudinal grooves for carrying products, wherein a top run extending between the return elements is at least partly supported, at a lower surface of the conveyor mat, on a guide track, and wherein a bottom run extending between the return elements is at least partly supported, at the upper surface of the conveying mat, on a return guide, such that, during use, the top run is guided via the guide track in a conveying direction oriented in longitudinal direction of the mat, and the bottom run is guided back, via the return guide, against the conveying direction, characterized in that the return guide is provided with elements reaching into the grooves.

2. A conveying system according to claim 1, wherein the conveying mat is supported on the return guide via the elements.

3. A conveying system according to claim 1 or 2, wherein the elements reaching into the grooves comprise ribs, whose ridge parts extend in longitudinal direction of the conveying mat.

4. A conveying system according to claim 3, wherein the ridge parts are provided with a curvature proceeding in longitudinal direction.

5. A conveying system according to any one of the preceding claims 3 or 4, wherein a multiple number of ribs, spaced apart at mutual intervals transversely to the conveying direction, are included on a central carrier.

6. A conveying system according to claim 5, wherein the central carrier forms a guide shoe or guide wheel.

7. A conveying system according to claim 5 or 6, wherein in conveying direction, several central carriers are spaced apart at mutual intervals as supports for the bottom run.
8. A conveying system according to any one of the preceding claims, wherein the conveying mat is provided with roller elements which, in the top run, cooperate with the guide track.

9. A conveying system according to claim 8, wherein the roller elements cooperate in the bottom run with the return guide.

10. A conveying system according to claim 9, wherein the elements reaching into the grooves drivingly engage the roller elements.

11. A return guide for a conveying system according to any one of the preceding claims, comprising a multiple number of guide shoes or guide wheels for cooperation with a bottom run of a conveying mat, each comprising a central carrier with ribs spaced apart at mutual intervals transversely to the conveying direction which are provided with ridge parts having a curvature proceeding in longitudinal direction.

12. A guide shoe or guide wheel for a conveying system according to any one of the preceding claims, comprising a central carrier with ribs spaced apart at mutual intervals transversely to the conveying direction, which are provided with ridge parts having a curvature proceeding in longitudinal direction.

13. A method for guiding back, by means of a return guide, against a conveying direction a bottom run of a conveying mat provided with grooves, wherein the bottom run is guided along elements reaching into the grooves.

14. A method according to claim 13, wherein the elements reaching into the grooves drivingly engage roller elements of the conveying mat.
A. CLASSIFICATION OF SUBJECT MATTER

INV. B65615/62
ADD. B65615/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Inter

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C

X See patent family annex

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Date of the actual completion of the international search

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