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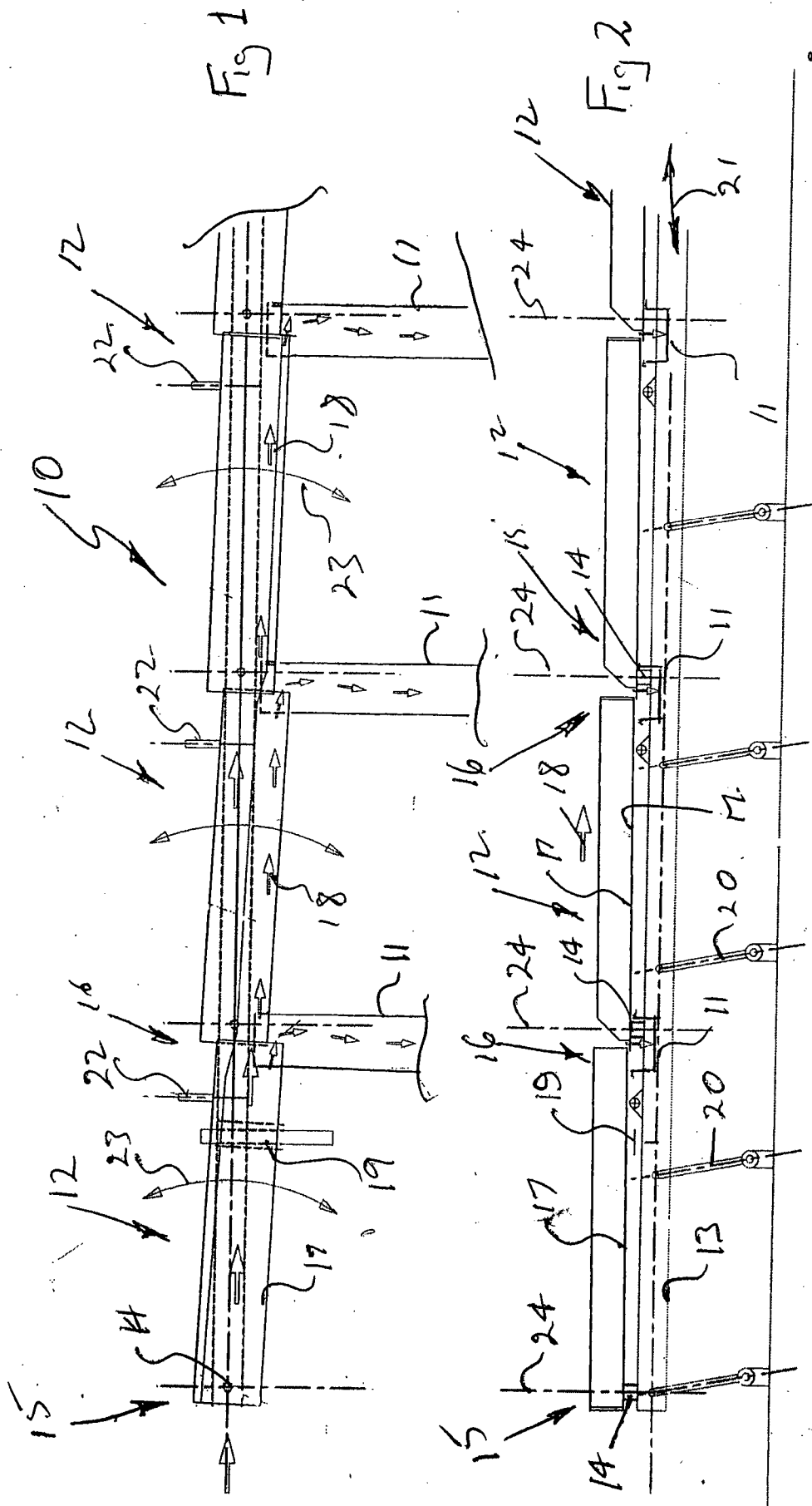
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A CONVEYOR

Abstract

A conveyor (10) that delivers product to a plurality of transverse conveyors of chutes (11). The conveyor (10) includes conveyor segments (12) along which the product
5 is conveyed. Product is removed from the conveyor (10) by the lateral displacement of an upstream end 15 or a downstream end 16 of adjacent conveyor segments (12).



A CONVEYOR

Technical Field

The present invention relates to conveyors and more particularly to conveyors that have at spaced locations along the conveyors means enabling removal of items being
5 conveyed.

Background of the Invention

The packaging industry, particularly in the packaging of snack foods, use conveyors to transport product to be packaged to spaced packaging locations. At each location there is typically a weighing machine and a packaging machine that places
10 weighed batches of product in bags.

The conveyors needs to feed sufficient product to each packaging machine. Accordingly, at spaced locations along the conveyor product is removed and delivered to the packaging machine. Typically, the product is removed by having the conveyors provided with gates that are opened and closed and through which the product is removed
15 from the conveyor and delivered to a further conveyor extending to the associated packaging machine. Typically, these further conveyors are transverse of the primary conveyor.

A known conveyor is a slip conveyor. A slip conveyor has a conveyor surface that is vibrated longitudinally to transport product longitudinally of the conveyor. Where
20 a number of conveyor surfaces are provided, it is known to displace the conveyor surfaces longitudinally to provide a gap between adjacent surfaces through which product is delivered.

The above discussed conveyor arrangements have a number of disadvantages including insufficient control of the delivery of product to the transverse conveyors and
25 problems in respect of cleaning.

Object of the Invention

It is the object of the present invention to overcome or substantially ameliorate the above disadvantage.

Summary of the Invention

There is disclosed herein a conveyor assembly including:

5 a first slip conveyor segment having a longitudinally extending conveyor surface upon which items to be conveyed are longitudinally transported, the segment having an upstream end and a downstream end, the upstream end being provided to receive said item;

10 a second slip conveyor segment, said second segment having a longitudinally extending conveyor surface upon which the items to be conveyed are longitudinally transported, the second segment having an upstream end and a downstream end, with said second segment being mounted relative to said first segment so that items leaving the first segment downstream end are delivered to the second segment upstream end,

15 said segments being mounted to provide for lateral displacement between the first segment downstream end relative to the second segment upstream end from an aligned position at which a desired quantity of said items pass from said first segment to said second segment, and a displaced position at which a further desired quantity of said items is removed from said conveyor as a result of relative displacement between the first segment downstream end and the second segment upstream end; and

20 a transverse conveyor positioned below said first segment downstream end and said second segment upstream end so that items leaving said first segment downstream end and not delivered to said second segment upstream end are delivered to said transverse conveyor.

Preferably, both conveyor surfaces are upwardly facing, and at least one of said segments is mounted for angular movement to provide for relative angular movement between the first segment downstream end and the second segment upstream end.

25 Preferably, at least one of said segments is pivotally mounted so as to be movable in a generally horizontal plane to change the relative position of the first segment downstream end with respect to the second segment upstream end to thereby provide said lateral displacement.

30 Preferably, said first segment is pivotally moved in a generally horizontal plane relative to said second segment.

Preferably, said segments are linear conveyors.

There is yet further disclosed herein a conveyor assembly including:

a first slip conveyor segment having a longitudinally extending conveyor surface upon which items to be conveyed are longitudinally transported, the segment having an upstream end and a downstream end, the upstream end being provided to receive said
5 item;

a second slip conveyor segment, said second segment having a conveyor longitudinally extending surface upon which the items to be conveyed are longitudinally transported, the second segment having an upstream end and a downstream end, with said second segment being mounted relative to said first segment so that items leaving the first
10 segment downstream end are delivered to the second segment upstream end,

said segments being mounted to provide for lateral displacement between the first segment downstream end relative to the second segment upstream end from an aligned position at which a desired quantity of said items pass from said first segment to said second segment, and a displaced position at which a further desired quantity of said
15 items is removed from said conveyor as a result of relative displacement between the first segment downstream end and the second segment upstream end, with the first segment downstream end being located above the second segment upstream end; and

a transverse conveyor positioned below said first segment downstream end and said second segment upstream end so that items leaving said first segment downstream
20 end and not delivered to said second segment upstream end are delivered to said transverse conveyor.

Preferably, both conveyor surfaces are upwardly facing, and at least one of said segments is mounted for angular movement to provide for relative angular movement between the first segment downstream end and the second segment upstream end.

25 Preferably, at least one of said segments is pivotally mounted so as to be movable in a generally horizontal plane to change the relative position of the first segment downstream end with respect to the second segment upstream end to thereby provide said lateral displacement.

Preferably, said first segment is pivotally moved in a generally horizontal plane
30 relative to said second segment.

Preferably, said segments are linear conveyors.

There is yet further disclosed herein a conveyor assembly including:

a first conveyor segment having a longitudinally extending conveyor surface upon which items to be conveyed are longitudinally transported, the segment having an upstream end and a downstream end, the upstream end being provided to receive said
5 item;

a second conveyor segment mounted on the base, said second segment having a conveyor longitudinally extending surface upon which the items to be conveyed are longitudinally transported, the second segment having an upstream end and a downstream end, with said second segment being mounted relative to said first segment so that items
10 leaving the first segment downstream end are delivered to the second segment upstream end,

said segments being mounted to provide for lateral displacement between the first segment downstream end relative to the second segment upstream end from an aligned position at which a desired quantity of said items pass from said first segment to
15 said second segment, and a displaced position at which a further desired quantity of said items is removed from said conveyor as a result of relative displacement between the first segment downstream end and the second segment upstream end, with at least one of said segments being pivotally mounted so as to be movable in a generally horizontal plane to change the relative position of the first segment downstream end with respect to the
20 second segment upstream end to thereby provide said lateral displacement; and

a transverse conveyor positioned below said first segment downstream end and said second segment upstream end so that items leaving said first segment downstream end and not delivered to said second segment upstream end are delivered to said transverse conveyor.

25 Preferably, both conveyor surfaces are upwardly facing, and at least one of said segments is mounted for angular movement to provide for relative angular movement between the first segment downstream end and the second segment upstream end.

Preferably, said first segment is pivotally moved in a generally horizontal plane relative to said second segment.

30 Preferably, the first segment downstream end is located above the second segment upstream end.

Preferably, said segments are linear conveyors.

There is yet further disclosed herein a conveyor assembly including:

a first slip conveyor segment having a longitudinally extending conveyor surface upon which items to be conveyed are longitudinally transported, the segment having an upstream end and a downstream end, the upstream end being provided to receive said item;

a second slip conveyor segment, said second segment having a conveyor longitudinally extending surface upon which the items to be conveyed are longitudinally transported, the second segment having an upstream end and a downstream end, with said second segment being mounted relative to said first segment so that items leaving the first segment downstream end are delivered to the second segment upstream end,

said segments being mounted to provide for lateral displacement between the first segment downstream end relative to the second segment upstream end so that a desired quantity of said items pass from said first segment to said second segment, with a further desired quantity of said items being removed from said conveyor as a result of relative displacement between the first segment downstream end and the second segment upstream end; and

a transverse conveyor positioned below said first segment downstream end and said second segment upstream end so that items leaving said first segment downstream end and not delivered to said second segment upstream end are delivered to said transverse conveyor.

Preferably, both conveyor surfaces are upwardly facing, and at least one of said segments is mounted for angular movement to provide for relative angular movement between the first segment downstream end and the second segment upstream end.

Preferably, the first segment downstream end is located above the second segment upstream end.

Preferably, at least one of said segments is pivotally mounted so as to be movable in a generally horizontal plane to change the relative position of the first segment downstream end with respect to the second segment upstream end to thereby provide said lateral displacement.

Brief Description of the Drawings

A preferred form of the present invention will now be described by way of example with reference to the accompanying drawings wherein:

Figure 1 is a schematic top plan view of a conveyor; and

5 Figure 2 is a schematic side elevation of the conveyor of Figure 1.

Detailed Description of the Preferred Embodiment

In the accompanying drawings there is schematically depicted a linear slip conveyor 10 that delivers product to a plurality of transverse conveyors or chutes 11. Typically, if the conveyor 10 is used to transport snack foods, the product is delivered
10 from the transverse conveyors 11 to a packaging machine.

The conveyor 10 includes a plurality of conveyor segments 12 that are mounted on a base 13. The base 13 is longitudinally extending so as to pass beneath each of the segments 12. Each segment 12 includes an upstream end 15, and a downstream end 16 between which a generally horizontal conveyor surface 17 passes. Product is located on
15 each surface 17 so as to be conveyed thereby in the direction of the arrows 18.

Preferably each segment 12 is pivotally mounted on the base 13 by means of a shaft 14 at or adjacent the upstream end 15. By this, the arrangement each downstream end 16 can be laterally displaced without any significant displacement of the upstream end 15 of that segment 12. Associated with each segment 12 is a slide member 19 upon
20 which the associated segment slidably rests. The base 13 is supported on a plurality of pivotally mounted arms 20, with the base caused to reciprocate in the direction of the arrow 21 so that the conveyor 12 operates as a slip conveyor.

The segments 12 overlap so that the downstream end 16 of each segment 12 is located above the upstream end 15 of the next adjacent downstream segment 12.

25 Attached to each segment 12 is a motor 21 such as an air or hydraulic cylinder. Operation of each motor 22 causes pivoting of the associated segment 12 angularly in the direction of the arcuate arrows 23. Pivoting of each segment 12 is about a generally vertical axis 24 provided by the respective shaft 14. This angular movement is further provided by each segment 12 being slidably supported on its respective slide member 19.

30 By operation of the motors 22, the alignment of each overlapping downstream end 16 with respect to its associated upstream end 15 can be adjusted. By displacing each

downstream end 16 laterally relative to its associated upstream end 15, product is allowed to leave the downstream end 16 and be delivered to the adjacent transverse conveyor 11.

The greater the degree of misalignment the more product that is delivered to the associated transverse conveyor 11. Accordingly, in the above described preferred
5 embodiment, the delivery of product to the transverse conveyors can be better controlled. This is at least partly due to the motors 21 being operable to “continuously” vary the alignment of the ends 15 and 16.

In an alternative embodiment the downstream upstream end 15 could be laterally displaced rather than the downstream end 16.

The claims defining the invention are as follows:

1. A conveyor assembly including:

a first slip conveyor segment having a longitudinally extending conveyor surface upon which items to be conveyed are longitudinally transported, the segment having an upstream end and a downstream end, the upstream end being provided to receive said item;

a second slip conveyor segment, said second segment having a longitudinally extending conveyor surface upon which the items to be conveyed are longitudinally transported, the second segment having an upstream end and a downstream end, with said second segment being mounted relative to said first segment so that items leaving the first segment downstream end are delivered to the second segment upstream end,

said segments being mounted to provide for lateral displacement between the first segment downstream end relative to the second segment upstream end from an aligned position at which a desired quantity of said items pass from said first segment to said second segment, and a displaced position at which a further desired quantity of said items is removed from said conveyor as a result of relative displacement between the first segment downstream end and the second segment upstream end; and

a transverse conveyor positioned below said first segment downstream end and said second segment upstream end so that items leaving said first segment downstream end and not delivered to said second segment upstream end are delivered to said transverse conveyor.

2. The conveyor assembly of claim 1, wherein both conveyor surfaces are upwardly facing, and at least one of said segments is mounted for angular movement to provide for relative angular movement between the first segment downstream end and the second segment upstream end.

3. The conveyor assembly of claim 1 or 2, wherein at least one of said segments is pivotally mounted so as to be movable in a generally horizontal plane to change the relative position of the first segment downstream end with respect to the second segment upstream end to thereby provide said lateral displacement.

4. The conveyor assembly of claim 1 or 2, wherein said first segment is pivotally moved in a generally horizontal plane relative to said second segment.

5. The conveyor assembly of any one of claims 1 to 4, wherein said segments are linear conveyors.

6. A conveyor assembly including:

a first slip conveyor segment having a longitudinally extending conveyor surface upon which items to be conveyed are longitudinally transported, the segment having an upstream end and a downstream end, the upstream end being provided to receive said item;

a second slip conveyor segment, said second segment having a conveyor longitudinally extending surface upon which the items to be conveyed are longitudinally transported, the second segment having an upstream end and a downstream end, with said second segment being mounted relative to said first segment so that items leaving the first segment downstream end are delivered to the second segment upstream end,

said segments being mounted to provide for lateral displacement between the first segment downstream end relative to the second segment upstream end from an aligned position at which a desired quantity of said items pass from said first segment to said second segment, and a displaced position at which a further desired quantity of said items is removed from said conveyor as a result of relative displacement between the first segment downstream end and the second segment upstream end, with the first segment downstream end being located above the second segment upstream end; and

a transverse conveyor positioned below said first segment downstream end and said second segment upstream end so that items leaving said first segment downstream end and not delivered to said second segment upstream end are delivered to said transverse conveyor.

7. The conveyor assembly of claim 6, wherein both conveyor surfaces are upwardly facing, and at least one of said segments is mounted for angular movement to provide for relative angular movement between the first segment downstream end and the second segment upstream end.

8. The conveyor assembly of claim 6 or 7, wherein at least one of said segments is pivotally mounted so as to be movable in a generally horizontal plane to change the relative position of the first segment downstream end with respect to the second segment upstream end to thereby provide said lateral displacement.

9. The conveyor assembly of claim 6 or 7, wherein said first segment is pivotally moved in a generally horizontal plane relative to said second segment.

10. The conveyor assembly of any one of claims 6 to 9, wherein said segments are linear conveyors.

5 11. A conveyor assembly including:

a first conveyor segment having a longitudinally extending conveyor surface upon which items to be conveyed are longitudinally transported, the segment having an upstream end and a downstream end, the upstream end being provided to receive said item;

10 a second conveyor segment mounted on the base, said second segment having a conveyor longitudinally extending surface upon which the items to be conveyed are longitudinally transported, the second segment having an upstream end and a downstream end, with said second segment being mounted relative to said first segment so that items leaving the first segment downstream end are delivered to the second segment upstream
15 end,

said segments being mounted to provide for lateral displacement between the first segment downstream end relative to the second segment upstream end from an aligned position at which a desired quantity of said items pass from said first segment to said second segment, and a displaced position at which a further desired quantity of said
20 items is removed from said conveyor as a result of relative displacement between the first segment downstream end and the second segment upstream end, with at least one of said segments being pivotally mounted so as to be movable in a generally horizontal plane to change the relative position of the first segment downstream end with respect to the second segment upstream end to thereby provide said lateral displacement; and

25 a transverse conveyor positioned below said first segment downstream end and said second segment upstream end so that items leaving said first segment downstream end and not delivered to said second segment upstream end are delivered to said transverse conveyor.

30 12. The conveyor assembly of claim 11, wherein both conveyor surfaces are upwardly facing, and at least one of said segments is mounted for angular movement to

provide for relative angular movement between the first segment downstream end and the second segment upstream end.

13. The conveyor assembly of claim 11 or 12, wherein said first segment is pivotally moved in a generally horizontal plane relative to said second segment.

5 14. The conveyor assembly of claim 11, 12 or 13, wherein the first segment downstream end is located above the second segment upstream end.

15. The conveyor assembly of any one of claims 11 to 14, wherein said segments are linear conveyors.

16. A conveyor assembly including:
10 a first slip conveyor segment having a longitudinally extending conveyor surface upon which items to be conveyed are longitudinally transported, the segment having an upstream end and a downstream end, the upstream end being provided to receive said item;

a second slip conveyor segment, said second segment having a conveyor
15 longitudinally extending surface upon which the items to be conveyed are longitudinally transported, the second segment having an upstream end and a downstream end, with said second segment being mounted relative to said first segment so that items leaving the first segment downstream end are delivered to the second segment upstream end,

said segments being mounted to provide for lateral displacement between the
20 first segment downstream end relative to the second segment upstream end so that a desired quantity of said items pass from said first segment to said second segment, with a further desired quantity of said items being removed from said conveyor as a result of relative displacement between the first segment downstream end and the second segment upstream end; and

25 a transverse conveyor positioned below said first segment downstream end and said second segment upstream end so that items leaving said first segment downstream end and not delivered to said second segment upstream end are delivered to said transverse conveyor.

17. The conveyor assembly of claim 16, wherein both conveyor surfaces are
30 upwardly facing, and at least one of said segments is mounted for angular movement to

provide for relative angular movement between the first segment downstream end and the second segment upstream end.

18. The conveyor assembly of claim 16 or 17, wherein the first segment downstream end is located above the second segment upstream end.

5 19. The conveyor assembly of claim 16, 17 or 18, wherein at least one of said segments is pivotally mounted so as to be movable in a generally horizontal plane to change the relative position of the first segment downstream end with respect to the second segment upstream end to thereby provide said lateral displacement.

20. A conveyor substantiates as hereinbefore described with reference to the
10 accompanying drawings.

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