

Description

FIELD OF THE INVENTION

The invention pertains to parcel sorting and more particularly to a an accessory for a tilt tray sorter arrangement which would provide multiple level sorting.

BACKGROUND OF THE INVENTION

Commercially available sorters consist of a transport system, usually of a chain conveyor construction, which carries trays on the top of an endless chain. These trays are loaded with items to be sorted, carried to a selected outlet position and tipped, whereby the item carried is dropped into a receptacle. The trays are reset before re-entering the loading area. However, existing transport systems are limited to a single level of trays.

One conventional tilt tray sorter generally comprises a moving chain which can carry a tilting element which includes a tray and a tilting mechanism. Such a parcel handling device, for example the 3D Tilt Tray Sorter is available from Beumer Pty Limited, 293A Seaview Road, Henley Beach, South Australia, 5022.

SUMMARY OF THE INVENTION

It is an object of the invention to substantially ameliorate some of the disadvantages of prior art tilt tray sorters.

Accordingly, the invention provides an accessory for a tilt tray sorter including a transport mechanism, the accessory comprising a frame which carries two or more tilting trays arranged one above the other, an independent tipping mechanism associated with each tray for tipping the tray and mounting means on the frame for suspending the frame from the transport mechanism.

In a preferred embodiment, the frame is provided with three trays each arranged to pivot about a substantially horizontal axis with respect to the frame. Preferably, each independent tipping mechanism comprises a cam member pivotally mounted on the frame and engaging a cam engaging means on the tray, whereby when the cam member is pivoted, the tray is tipped.

The cam member preferably comprises a pivoting plate provided with an arm member which engages between two rods mounted on an underside of the tray. The pivoting plate is preferably arranged for riding over a cam actuator provided on the sorter for pivoting the cam and therefore tipping the tray. The cam actuator is selectively movable into a position where the pivoting plate rides over the cam actuator.

Preferably also, each tipping mechanism is provided with a latch to hold the cam member in a pivoted position so that the tray remains tipped until the latch is released.

BRIEF DESCRIPTION OF THE DRAWINGS

One embodiment of an accessory for a tilt tray sorter according to the invention will now be more fully described, by way of example, with reference to the drawings, of which:

Figure 1 is a front elevation of an accessory according to one embodiment of the present invention; and

Figure 2 is a side elevation of the accessory depicted in Figure 1.

DETAILED DESCRIPTION OF THE DRAWING

As shown in Fig. 1, the accessory 10 according to one embodiment of the present invention comprises a frame 11 and an upper fixture 12. The accessory 10 is adapted to be suspended by the fixture 12 from a transport mechanism of the type usually associated with conventional parcel sorting equipment. If required, the frame 11 may include additional means 13, located at the base of the frame 11 for fixing the frame to guide rails or a second transport track to ensure that the frame 11 remains erect. The frame 11 carries two or more tilting trays 14 which are attached by pivots 15 to the frame 11. Each of the tilting trays 14 has associated with it, a tilting mechanism 16. The method used to tip the trays, that is the tilting mechanism, may be any one of a number of conventional tipping mechanisms presently in use. One particularly advantageous mechanism is described herein by way of example.

In this particular embodiment, the tilting mechanism comprises a pair of parallel rods 17 which are suspended below each tray. In addition, a bracket 18 is provided above each tray 14. The bracket carries a cam 19. The cam 19 pivots about an upper axis 20. The side of the cam which faces the tray 14 carries a stub 21. The stub 21 is received between the parallel rods 17. Thus, as the cam 19 pivots and returns to its rest position, the tray 14 is displaced from a level position to a tipped position and back again. The bracket 18 also carries a latch 22. The latch 22 pivots about an upper axis 23. The cam 19 carries, at a lower end and on a side facing away from the tray 14, first and second latching pins 24, 25. When the cam 19 is rotated towards the latch, one or both pins 24, 25 engage a ramp surface 26 on a lower end of the latch and cause the latch to pivot out of the way. The first latch pin 24 eventually contacts a flat surface of the latch thus causing the latch to

return to its original position and thereby causing the latch to engage and retain the second latch pin 25.

As depicted in Fig. 2, the tilting trays 14 are normally in a level position. At a particular tipping station, they pass by a pneumatic cylinder 27 which carries a round cam actuator 28 at the end of its piston. If the piston is retracted, no contact is made between the cam 19 and the actuator 28. If the piston is extended, the cam 19 will ride over the actuator 28 thus causing the tipping mechanism to displace the tilting tray 14 from its normally level position.

At a separate location, the tray may be restored to the level position, solely under the influence of gravity, by releasing the latch mechanism from the second pin 25. This may be achieved in any conventional manner. In a preferred embodiment, the side of the latch 22 which faces away from the tray 14 carries a short ramp 29 which is used for this purpose.

Claims

1. An accessory (10) for a tilt tray sorter including a transport mechanism, the accessory comprising a pendant frame (11) which carries two or more tilting trays (14) arranged one above the other, an independent tipping mechanism associated with each tray (14) for tipping the tray and mounting means on the frame (11) for suspending the frame from the transport mechanism.
2. An accessory according to claim 1, wherein the frame is provided with three trays (14) each arranged to pivot about a substantially horizontal axis (15) with respect to the frame.
3. An accessory according to either claim 1 or claim 2, wherein each independent tipping mechanism comprises a cam member (19) pivotally mounted on the frame (11) and engaging a cam engaging means (17) on the tray (14), whereby when the cam member (19) is pivoted, the tray (14) is tipped.
4. An accessory according to claim 3, wherein the cam member (19) comprises a pivoting plate provided with an arm member (21) which engages between two rods (17) mounted on an underside of the tray (14).
5. An accessory according to claim 4, wherein the pivoting plate is arranged for riding over a cam actuator (28) provided on the sorter for pivoting the cam (19) and therefore tipping the tray (14).
6. An accessory according to an preceding claim, wherein each tipping mechanism is provided with means (22, 25) for keeping the tray (14) in a tipped position until released.
7. An accessory according to any one of claims 3 to 5, wherein the means for keeping the tray in a tipped position comprises a latch (22) to hold the cam member (19) in a pivoted position so that the tray (14) remains tipped until the latch (22) is released.

Patentansprüche

1. Zubehörteil (10) für einen Sortierer mit Kippschale und einem Transportmechanismus, wobei das Zubehörteil einen hängenden Rahmen (11), der zwei oder mehr übereinander angeordnete Kippschalen (14) trägt, einen unabhängigen, jeder Schale (14) zugeordneten Umkipppmechanismus zum Umkippen der Schale und ein Montagemittel am Rahmen (11) zur Aufhängung des Rahmens am Transportmechanismus umfaßt.
2. Zubehörteil nach Anspruch 1, bei dem der Rahmen drei Schalen (14) hat, die so angeordnet sind, daß sie um eine gegenüber dem Rahmen im wesentlichen horizontale Achse (15) schwenken.
3. Zubehörteil nach Anspruch 1 oder 2, bei dem jeder unabhängige Umkipppmechanismus ein Nockenelement (19) umfaßt, das schwenkend am Rahmen (11) montiert ist und ein Nockeneingriffsmittel (17) an der Schale (14) in Eingriff nimmt, wodurch die Schale (14) umgekippt wird, wenn das Nockenelement (19) geschwenkt wird.
4. Zubehörteil nach Anspruch 3, bei dem das Nockenelement (19) eine Schwenkplatte mit einem Armelement (21) umfaßt, das zwischen zwei an einer Unterseite der Schale (14) montierten Stangen (17) eingreift.
5. Zubehörteil nach Anspruch 4, bei dem die Schwenkplatte so angeordnet ist, daß sie über ein am Sortierer zum Schwenken des Nockens (19) und daher zum Umkippen der Schale (14) vorgesehenes Nockenbetätigungsglied (28) hinwegläuft.
6. Zubehörteil nach einem der vorhergehenden Ansprüche, bei dem jeder Umkipppmechanismus Mittel (22, 25) aufweist, um die Schale (14) bis zum Lösen in einer umgekippten Position zu halten.



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6. Zubehörteil nach einem der vorhergehenden Ansprüche, bei dem jeder Umkippmechanismus Mittel (22, 25) aufweist, um die Schale (14) bis zum Lösen in einer umgekippten Position zu halten.



7. Zubehöriteil nach einem der Ansprüche 3 bis 5, bei dem es sich bei dem Mittel, um die Schale in einer umgekippten Position zu halten, um eine Rastklinke (22) handelt, die das Nockenelement (19) in einer geschwenkten Position hält, so daß die Schale (14) umgekippt bleibt, bis die Rastklinke (22) gelöst wird.

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la came (19) dans une position tournée de façon que le plateau (14) reste basculé jusqu'à ce que le verrou (22) soit dégagé.

Revendications

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1. Accessoire (10) pour une trieuse à plateaux basculants comprenant un mécanisme de transport, l'accessoire comprenant un châssis pendant (11) qui porte deux ou plus de deux plateaux basculants (14) agencés l'un au-dessus de l'autre, un mécanisme de basculement indépendant associé à chaque plateau (14) pour basculer le plateau et des moyens de montage prévus sur le châssis (11) pour suspendre le châssis au mécanisme de transport.

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2. Accessoire selon la revendication 1, dans lequel le châssis est équipé de trois plateaux (14) dont chacun est agencé pour pivoter par rapport au châssis autour d'un axe sensiblement horizontal (15).

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3. Accessoire selon la revendication 1 ou la revendication 2, dans lequel chaque mécanisme de basculement indépendant comprend une came (19) montée pivotante sur le châssis (11) et qui attaque un moyen (17) suiveur de came situé sur le plateau (14), de sorte que, lorsque la came (19) pivote, le plateau (14) bascule.

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4. Accessoire selon la revendication 3, dans lequel la came (19) comprend une plaque pivotante munie d'un bras (21) qui s'engage entre deux tringles (17) montées sur la face intérieure du plateau (14).

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5. Accessoire selon la revendication 4, dans lequel la plaque pivotante est agencée pour monter sur un actionneur de came (28) prévu sur la trieuse pour faire pivoter la came (19) et faire ainsi basculer le plateau (14).

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6. Accessoire selon une quelconque des revendications précédentes, dans lequel chaque mécanisme de basculement est muni de moyens (22, 25) servant à maintenir le plateau (14) dans une position basculée jusqu'à ce qu'il soit libéré.

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7. Accessoire selon une quelconque des revendications 3 à 5, dans lequel le moyen servant à maintenir le plateau dans une position basculée comprend un verrou (22) pour maintenir

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