

Unique tray-handling system — Project principles



PTT Post delivers 21 million items of mail every day in the Netherlands. Approximately 40% is machine-processed. After the commissioning of six new dispatch points, 98% of mail sorting is automated to an advanced degree. The objective was to improve both competitiveness and the quality of mail deliveries. CSi has been chosen as system supplier by PTT Post for the automation of the first of two sorting cycles, in which the trays with mail are sorted into 180 main destinations.



IMPROVING PERFORMANCE

The tray trolleys with mail trays are unloaded fully automatically after they have been fed into the system in an exceptionally user-friendly manner. The capacity per destacker is specified at more than 2500 "trays small" and 2200 "trays large" per hour. The "trays small" are filled with the smaller items of mail, like bank statements and postcards, the "trays large" with large items, like legal envelopes, magazines and newspapers. The mail is lined up against two walls. It may only move to a minimum degree during the entire tray-sorting process.

The trays are placed on conveyor belts after destacking and the various flows from the destackers merge in a guided circuit, which has exits to two sorting decks and a reject conveyor.

The system determines the destination of a tray on the basis of a bar code applied by an operator and the destination corresponds with an accumulator line for one of the sorting decks. When the relevant line is reached, the rotating pusher pushes the tray out of the guided circuit. A maximum capacity of 5400 trays per hour is achieved per pusher as a result of the rotating movement.

An important aspect is that the mail must not move. The rotating movement of the pusher ensures a smooth sorting movement for the trays, the acceleration of the trays being very slight. The trays are set crosswise on a conveyor belt on the accumulator line with spaces between, so that they do not collide. The trays are slowly positioned against each other on the second half of the accumulator line, so that the accumulation length required is minimal. A full tray trolley load is subsequently sent to one of the stackers.

The orientation of the trays is important when stacking. The bar code label is only present on one side, while the trays within a column must always have the same orientation. The tray is turned in the right direction after the position of the bar code has been determined and the empty tray trolleys can be loaded after the trays have been checked for items of mail projecting upwards.

The final result is the ultimate in internal logistics: a fully automatic, futuristic tray-sorting system, which has to meet the highest requirements in terms of capacity, noise, accelerations, maintenance, durability and ergonomics.



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IMPROVING PERFORMANCE

PTT Post is ready for this millennium



Rotating Pusher

After feeding through and identification on the guided circuit, the trays are sorted at a maximum capacity of 4500 trays per hour. The items of mail will hardly move because of the minimal accelerations. The sorting frames are exceptionally maintenance-friendly and take little time to replace.



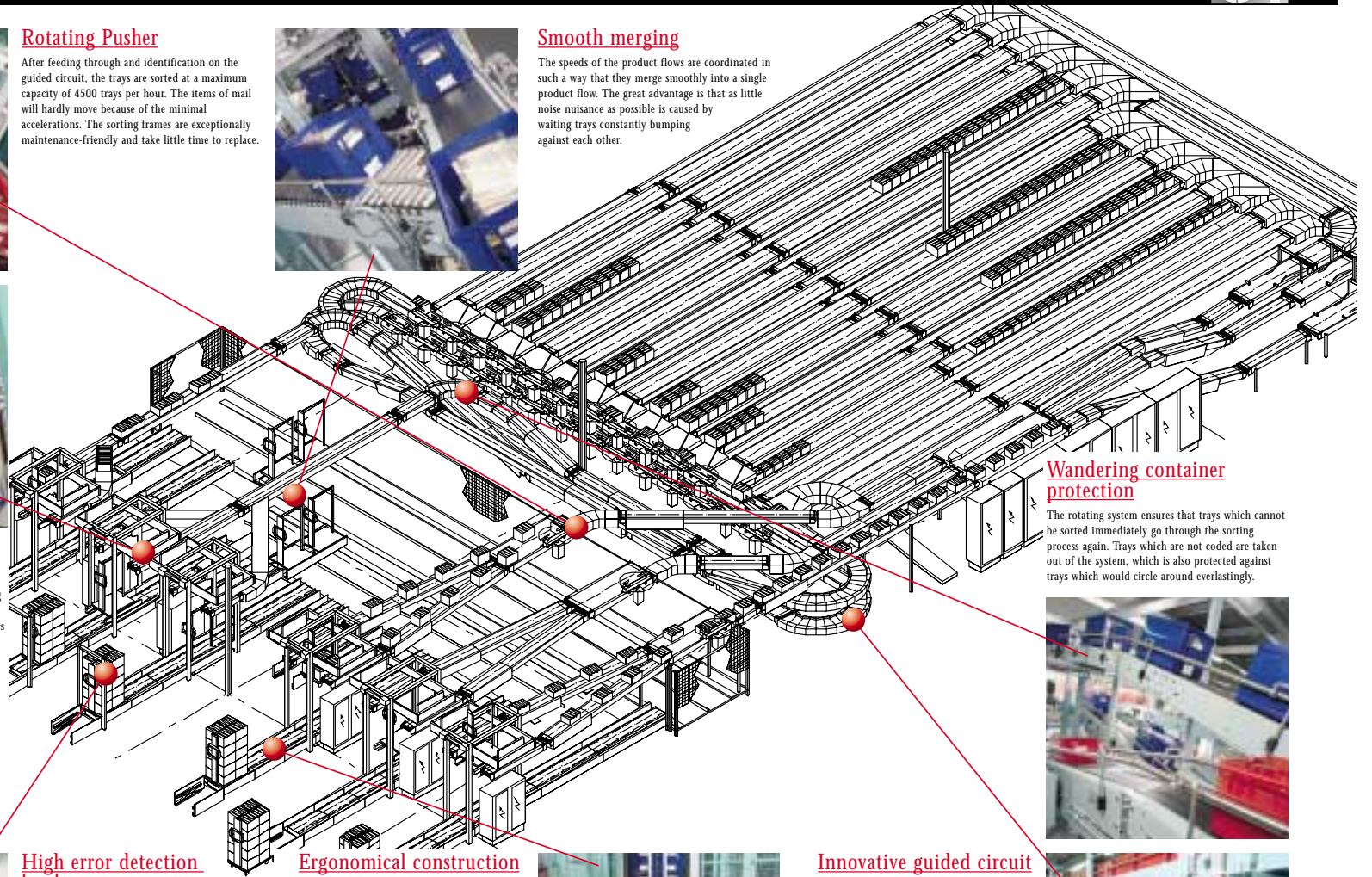
Smooth merging

The speeds of the product flows are coordinated in such a way that they merge smoothly into a single product flow. The great advantage is that as little noise nuisance as possible is caused by waiting trays constantly bumping against each other.



Specially developed stacker / destacker

The trays are hooked onto the tray trolley. Stacking and destacking, therefore, requires a special movement. The specially developed tray (de)stackers have a capacity of more than 2500 trays per hour.



Wandering container protection

The rotating system ensures that trays which cannot be sorted immediately go through the sorting process again. Trays which are not coded are taken out of the system, which is also protected against trays which would circle around everlastingly.



High error detection level

If a tray has not been placed properly in the tray trolley, that trolley will not be accepted. The operator can rectify the situation or reclaim the trolley. Nor does the system accept a mix of red and blue trays; a mixed tray trolley is returned. Error messages are displayed by a PC and the operator can use help texts to deal with breakdowns.

Ergonomical construction

The construction of the system is very maintenance-friendly. All machines and lines are easily accessible and the system is extremely modern and compact with an aesthetic finish.



Innovative guided circuit

The trays pass along the top deck at a capacity of 4500 trays per hour and automatically move apart in the bends, making it easy to read the bar code. The bar code determines the location on the sorting deck where the trays will be accumulated until a full load has been collected.

