

DESCRIPTION

The invention relates to sheet feeders according to the pre-characterizing clause of Patent Claim 1.

Such a sheet feeder, but without a non-stop device, is known for sheet-fed printing machines from EP-A2 0 309 388. Laterally adjustably arranged guides for the vertical movement of the pile table, usually arranged on a pile board suspended on chains, are effective by means of motor-driven adjusting elements, controlled by the sensor, so that the pile table is laterally aligned in a way corresponding to the lateral offset of the sheet side detected by the sensor. The adjusting element comprises a spindle which is mounted rotatably on the pile board, is motor-driven and passes through an axially fixed nut thread. A device for laterally aligning the main pile on a pile table in a sheet feeder is known from German Offenlegungsschrift 28 08 774. A device for automatically aligning at least one side edge of the sheets in the auxiliary pile of a non-stop device comprising [lacuna] bar at the sheet leading edge and at the sheet trailing edge supported on in each case a transversely running rail is described in German Patent Specification 29 11 735. This device too has a sensor which senses the position of the sheet side by which adjusting elements for laterally aligning the auxiliary pile are controlled. The adjusting elements likewise comprise a spindle and a threaded nut, which in this arrangement is driven by an electric motor. Known from this is also the arrangement of guides for the vertical movement of the auxiliary pile, but these vertical guides are fixed. That the main pile can have separate means for automatic lateral aligning is not mentioned in the printed publication.

It is the object of the invention to design a sheet feeder, in particular for sheet-fed printing machines, which has the generic features according to the pre-characterizing clause of Patent Claim 1 in such a way that it carries out an automatic correction of the main pile and of the auxiliary pile with just one adjusting device and makes possible a lateral offsetting of the

main pile with respect to the auxiliary pile while the machine is running.

The invention achieves this object by a design having the features according to the characterizing clause of Patent Claim 1.

By this design, the automatic aligning and correcting of the main pile and of the auxiliary pile of a non-stop device are achieved by a single adjusting device, it additionally being possible to perform a lateral alignment of the main pile with respect to the auxiliary pile while the machine is running. This has the advantage that the auxiliary pile and at the same time a main pile newly introduced into the feeder are laterally aligned automatically by the sheet run-in control. The new main pile can subsequently be adjusted in order to align its position with the auxiliary pile to make possible a troublefree transfer from the auxiliary pile to the new main pile during a pile change.

In the case of a preferred embodiment of a feeder with vertical guides for the pile table and vertical guides for the non-stop device it is provided that the guides for the non-stop device are connected by an adjusting element, controlled by the sheet run-in control, to fixed parts of the machine frame, and a further adjusting element, actuated by hand or by motor, is provided between the guide for the non-stop device and the guide for the vertical movement of the pile table, in order to be able to change the lateral spacing of the two guides.

In the case of another embodiment, a joint laterally adjustably arranged guide is provided, which is connected by an adjusting element, controlled by the sheet run-in control, to a fixed frame part of the machine, and a further adjusting element is fitted directly on the pile board, in order to adjust this pile board laterally with respect to the common guide.

Claims 3 to 4 contain further essential design features of the idea of the invention.

To emphasize better the principle achieving the

object of the invention, exemplary embodiments are diagrammatically represented in the drawing, in which:

5           Figure 1 shows a partial front view of an adjusting device seen counter to the sheet running direction,

Figure 2 shows a horizontal section of the arrangement according to Figure 1 underneath the auxiliary pile,

10          Figure 3 shows a partial front view, seen counter to the sheet running direction, of a modified exemplary embodiment of an adjusting device, and

Figure 4 shows a horizontal section of the arrangement according to Figure 3 underneath the auxiliary pile.

15           In the exemplary embodiment of Figures 1 and 2 there is arranged between the two side parts 1 a pile table 2 for the main pile 3 on a pile board 4, which is suspended for example on chains which are connected to a drive for executing the vertical movements of the pile board and of the pile table arranged thereon. During the vertical movement, the pile board is guided in a guide 5, which is arranged laterally movably in order to make possible lateral aligning movements of the main pile 3.

25           The front non-stop rail 6 and the rear non-stop rail (not shown in the drawing) are likewise arranged on a chain lifting mechanism (not shown in the drawing) and serve for supporting the non-stop bars 7, pushed in from the rear in the sheet running direction for non-stop operation, for supporting the auxiliary pile 8. The non-stop rails 6 are guided on both sides in vertical guides 9, which are likewise arranged laterally movably. A threaded spindle 10 passes through a threaded nut 11, fastened on the guide 9, and is axially fixed and rotatably mounted in the side wall 1 of the frame by its one end. The other end of the threaded spindle 10 is connected to a geared motor 12, controlled by the sheet running control. A further threaded spindle 13 passes through a threaded nut 14, fastened on the vertical

guides 5 for the pile table 2, and is rotatable in a radial/axial bearing 15 arranged on the guide 9, but is mounted undisplaceably in the axial direction. This threaded spindle 13 consequently connects the vertical guide 5 for the pile table 2 to the vertical guide 9 for the front non-stop rail 6, so that the geared motor 12, controlled by the sheet run-in control, laterally adjusts the guides 9 and 5 jointly. The rear non-stop rail (auxiliary pile rail) is mounted in such a manner that it can be easily displaced laterally and is also moved along by the non-stop bars 7 and the pile lying thereupon. It is also possible that a rigid connection between the two non-stop rails is provided. A displacement of the vertical guide 5 for the pile table 2 with respect to the vertical guide 9 for the non-stop rail 6 can be carried out by means of the threaded spindle 13, which can be turned by a hand wheel 16 or alternatively or additionally by a motor 17, so that the main pile 3 can be aligned on the one hand by means of the sheet running control and on the other hand additionally by hand by actuation of the hand wheel 16 or of the geared motor 17.

Figure 2 shows an exemplary embodiment in which the guide 9, composed of a plurality of individual elements, is effective in the vertical direction as a guide both for the pile board 4 and for the non-stop device (not shown in this Figure of the drawing). A transversely running guide strip 18 is connected vertically movably to the guide 9 by a guide bolt 19. A slide block 21 fastened on the pile board 4, is horizontally movable in a slot-shaped clearance 20 of the guide strip 18 and engages behind a step formation, so that a connection which is fixed in the sheet running direction is established between the guide 9 and the pile board 4. This connection is, however, horizontally displaceable by means of the slide block 21 in the clearance 20 and also vertically movable by means of the guide bolt 19. The paper stops extending vertically parallel with respect to one another are denoted by 22 in the figures of the drawing.

A simplified embodiment of the idea of the invention is represented in Figures 3 and 4. According to this, there is only provided one vertical guide 9, on which both the non-stop rails 6, carrying the auxiliary pile 8 via the non-stop bars 7, and the pile board 4, carrying the main pile 3 on the pile table 2 are guided. A threaded spindle 10 connects this guide 9 to the side part 1 of the frame (not otherwise shown). It passes through a threaded nut 11, fastened on the guide 9, and can be driven by a geared motor controlled by the sheet running control. A further threaded spindle 13 is rotatably mounted axially undisplaceably directly on the pile board 4 and passes through the thread of a threaded nut 14, which is firmly connected to the guide strip 18, the firm connection of which, in the sheet running direction, with the parts of the guide 9 is established by a guide bolt 19, as has already been described with respect to Figure 2. In the case of this arrangement, a lateral aligning movement is performed by means of the threaded spindle 10 both of the auxiliary pile, supported on the non-stop rails, and of the main pile supported on the pile table of the pile board, but the said main pile can be additionally aligned laterally with respect to the auxiliary pile by turning the threaded spindle 13 with respect to the auxiliary pile. Instead of the mounting shown in Figures 3 and 4 of the threaded spindle 13 on the pile board 4, its mounting may also be performed directly on parts of the guide 9, so that the threaded nut passed through by the spindle can be arranged firmly on the pile board. In the case of this simplified type of design, a hand wheel 16 is provided instead of a motor for the actuation of the threaded spindle 13.



CLAIMS

1. Sheet feeder having a pile table (2), guided vertically movably in laterally adjustable guides (5), a non-stop device (6, 7), likewise guided vertically movably in laterally adjustable guides (9), and a device for automatically aligning at least one sheet side, which has a sensor which detects the position of the side edge and controls motorized adjusting elements for lateral aligning movements of a carrier supporting the pile before the sheet transfer, characterized in that the guides (5) for the pile table (2) and the guides (9) for the non-stop device (6, 7) are jointly adjustable and can be set relative to one another in the direction of the lateral aligning movement.
2. Sheet feeder according to Claim 1, characterized in that the guides (5) for the pile table (2) and the guides (9) for the non-stop device (6, 7) are connected to one another by an adjusting element (13, 14) effective in the direction of the lateral aligning movement.
3. Sheet feeder according to Claims 1 and 2, characterized in that the adjusting element comprises a rotatable spindle (13) and a threaded nut (14), through which the said spindle passes and which is fastened on the one guide (5), the threaded spindle (13) being mounted axially undisplaceably on the other guide (9).
4. Sheet feeder according to Claims 1 to 3, characterized in that a further adjusting element (10, 11), effective in the direction of the lateral aligning movement, connects the guide (9) for the auxiliary piling device (6, 7), in such a manner that it can be set, to a fixed side part (1) of a frame and has a drive motor controlled by the sheet running control, the former adjusting element (13, 14) connecting this guide (9) in the same way, in such a manner that it can be set, to the guide (5) for the pile table (2).
5. Sheet feeder according to Claims 1 to 4, characterized in that the motor-driven adjusting element (10, 11) for the guide (9) with respect to the side part (1) likewise comprises a threaded spindle (10), which is



mounted in an axially fixed manner in the side part and passes through a threaded nut (11), which is fastened on the guide (9) for the non-stop device (6, 7).

- 5 6. Sheet feeder according to Claim 3, characterized in that the adjusting element (13, 14) effective between the guide (9) for the non-stop device (6, 7) and the guide (5) for the pile table (2) can be turned by hand.