Sept. 15, 1953

H. F. BRUNS

2,652,249

STACK SUPPORT FOR SHEET FEEDERS

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Fig. 1.

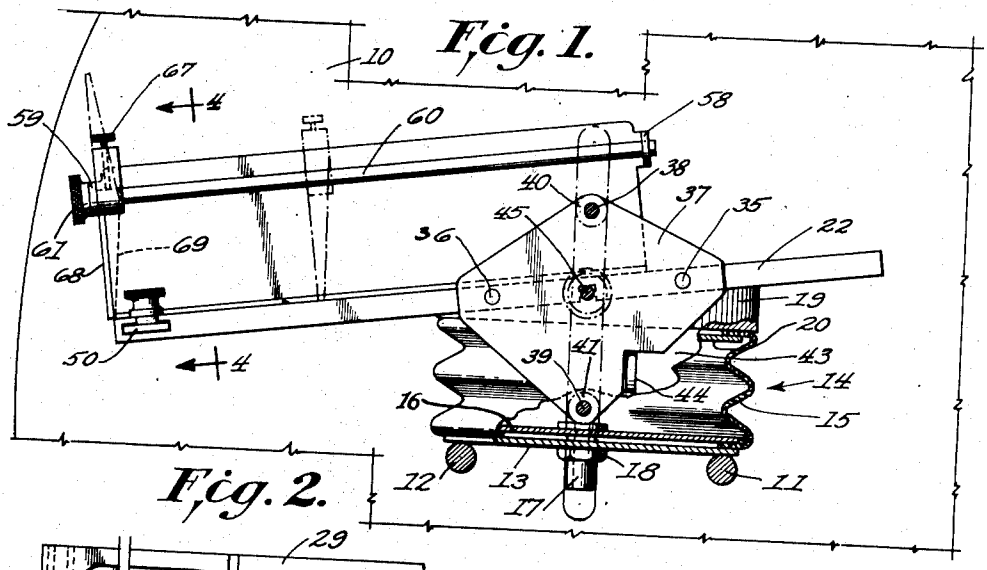


Fig. 2.

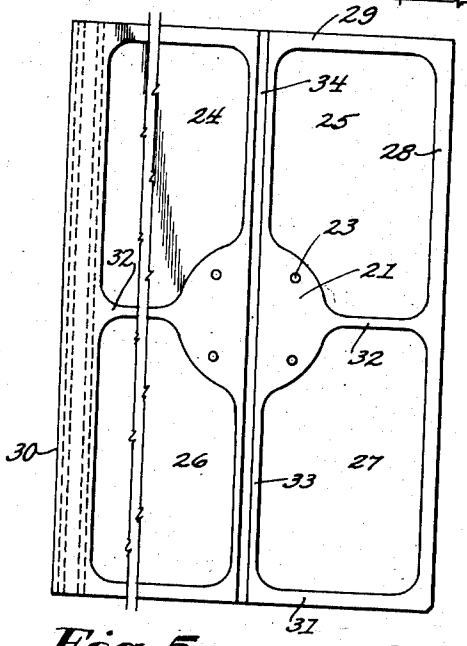


Fig. 3.

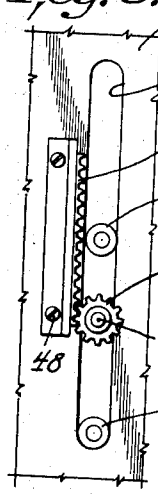


Fig. 4.

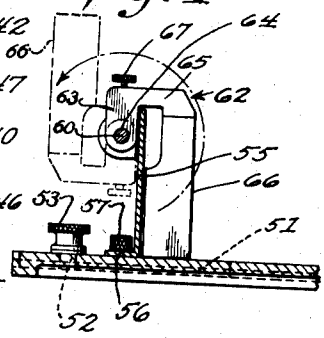


Fig. 7.

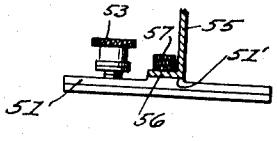


Fig. 5.

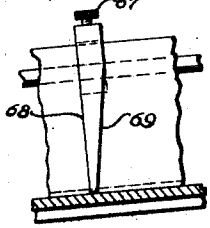
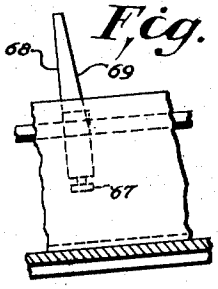


Fig. 6.



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STACK SUPPORT FOR SHEET FEEDERS

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8 Claims. (Cl. 271—61)

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The present invention relates to a supporting table or platform for a stack of paper sheets or the like and, more particularly, to new and improved, adjustable guides for the sides and rear end of the stack. The invention is particularly adapted for use with a sheet feeder of the type which successively removes the uppermost sheet from the stack and feeds the same forwardly into a sprinting press, duplicating machine, or other sheet handling or treating apparatus.

A primary object of the invention is to combine with such a table or platform improved guides for the sides of the stack which are laterally adjustable to accommodate stacks of sheets of different width.

Another object of the invention is to provide improved tail guides for the stack of sheets which are longitudinally adjustable, from the rear toward the front of the platform, to accommodate stacks of sheets of different lengths.

Another object of the invention is to provide tail guides which may be readily swung from an inoperative, upwardly and laterally disposed position, downwardly and inwardly to an operative position in engagement with the rear end of the stack of sheets.

Another object of the invention is to provide improved tail guide means mounted directly upon the side guide means, to the end that, when the side guides are laterally adjusted, the tail guides are moved simultaneously therewith.

Still a further object of the invention is to provide side and tail guides which may be readily adjusted at the rear end of the table or platform, which is the most convenient position for access by the operator.

Another object is to provide side guides for a stack of sheets which are angularly adjustable, so that the guides may be brought into registry with a stack of sheets having angularly disposed side edges.

Another important object is to provide a table or platform having a smooth continuous, planar upper stack-supporting surface characterized by the absence of grooves or slots in area occupied by the sheets.

Other and further objects and advantages of the invention will be apparent from a consideration of the following description of a preferred embodiment, shown for purposes of illustration in the accompanying drawings, in which

Figure 1 is a side elevation and fragmentary section of a preferred form of the invention;

Figure 2 is a bottom plan view of the feed table or platform;

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Figure 3 is an enlarged side elevation of the table guiding and stabilizing devices;

Figure 4 is a section on line 4—4 of Figure 1;

Figures 5 and 6 are diagrammatic side views, looking outwardly toward the inner face of one side guide, showing one tail guide in its operative and inoperative positions, respectively, and

Figure 7 is a side elevation of one of the slide blocks which support the side guide plates.

The feed table of the present invention may be mounted between two upright side plates, constituting main side frames for a duplicating machine or the like, one of which members is shown at 10 in Figure 1. These plates may be similar to the corresponding elements shown in the prior application of Gullixson and Bruns, Serial No. 712,538, filed November 27, 1946, and may or may not support the associated elements of a sheet feeder and duplicating machine or other apparatus. A pair of transversely extending rods 11 and 12, secured at their ends to the side plates may support a bottom plate 13 of a bellows assembly 14. The assembly comprises a pleated or corrugated sleeve 15 of gas-impervious material, such as sheet rubber, having its lower end clamped upon the upper surface of the plate 13 by a disk 16. A hollow nipple 17 extending through aligned apertures in the plate and disk, with a nut 18 threaded thereon secures the parts together. The other end of the sleeve 15 is clamped against the bottom surface of a wedge-shaped block 19, by a clamping disk 20, secured to the block by suitable screws or the like.

The upper surface of the block 19 is rearwardly and downwardly inclined and supports the central portion 21 of the feed table or platform 22, tapped holes 23 being provided in the undersurface for the reception of screws extending upwardly through bores in the block 19.

As indicated in Figures 1 and 2, the undersurface of the table is recessed as at 24, 25, 26, and 27, to reduce its weight, and providing marginal reinforcing ribs 28, 29, 30, and 31, and longitudinal and transverse ribs 32 and 33. The undersurface of the transverse rib 33 is provided with a continuous groove 34, for the reception of a stabilizer shaft as hereinafter explained.

Secured to the side edges of the table, by screws 35 and 36, are a pair of guiding plates, one of which is shown at 37. The plates each carry a pair of outwardly projecting pins 38 and 39, upon which are journalled rollers 40 and 41, disposed in vertical guide slots formed in the main side plates 10, one of which slots is shown

at 42 in Figure 3. Hence, although the table 22 is mounted upon an inclined plane, it is guided for vertical movement by the roller and the slots.

The plates 37 have cut-out portions 43 along their forward, downwardly facing edges and in each space so provided, a roller 44 is disposed, journalled upon a horizontal pin secured to the vertical edge of the cut-out and arranged to make rolling contact with the inner face of the adjacent main side plate 10.

A shaft 45, disposed in the transverse groove 34, in the bottom of the platform and journalled in bores in the plates 37, has a gear 46 on each end. Each gear meshes with a rack 47, secured, by screws 48, to the outer face of the adjacent main side plate, and extending along one side of the guide slot 42. Hence, as the table is moved upwardly and downwardly, the gears 46 travel uniformly along the racks 47, and lateral tipping of the table is prevented.

Adjacent the rear end of the table or platform 22, in the upper surface thereof, there is an inverted T-shaped, undercut slot 50. Disposed within the slot are a pair of independent slide blocks 51 of complemental, inverted T-section, with the upper face of the stem portion terminating slightly below the upper surface of the table, except at a central section 51', which is flush with said upper surface. The blocks each carry an upwardly projecting, threaded stud 52, upon which knurled nuts 53 are threaded, with friction washers interposed, if desired. When the nuts are loosened, the blocks are slidable in the groove, but when tightened, the blocks are clamped in fixed position.

The stack side guides each comprises an upright plate 55, having a laterally and outwardly turned bottom flange 56, secured at its rear end to the associated raised central section 51' of the slide block 51 by a screw 57 threaded into a tapped bore in the block. At its forward and rear ends, adjacent the upper edge, each side guide has a laterally and outwardly turned apertured ear 58 and 59. Rods 60 having knurled knobs 61 fast on their rear edges are mounted for rotation in the apertures in the ears 58 and 59.

Each rod 60 carries a tail guide 62, comprising a relatively thick head 63 having a bore 64 slidably embracing the rod 60, and a laterally extending arm 65, connected integrally at its outer end to a depending wing member 66. Each tail guide is adapted to be secured to the associated rod 60 by a set screw 67, extending through a tapped bore in the head portion 63.

The rear face 68 of each wing 66 is preferably, though not necessarily, disposed on a plane normal to the axis of rod 60 and bore 64, while the front face 69 is disposed on a plane inclined with respect thereto, as illustrated in Figure 1, on a vertical plane when in the normal, operative position, behind a stack of sheets on the table. As the tail guide is swung, by rotation of shaft 60, from the inwardly projecting, lower position shown in Figures 1 and 5, to the upper, outwardly projecting, inoperative position, by movement in an inclined plane normal to the axis of the rod 60, the forward face 69 recedes from the stack, to the position shown in dotted lines in Figure 1 and also in Figure 6. When moved in the opposite direction, to the operative position, the front face 69 approaches the rear end of the stack, moves into contact therewith, and tends to align the rear ends of the sheets therein.

If guide slot 42, Figure 3, is not vertical, then front face 69 should also be inclined from vertical and be parallel with 42.

The longitudinal position of each tail guide with respect to the table may be adjusted by loosening the set screws 67 and sliding the same along the rods 60 and again tightening the screws. The angular position of each side guide may be adjusted by loosening the screw 57 and swinging the guide to the desired position, thereafter retightening the screw. Hence, stacks of sheets having side edges disposed at other than right angles to the front and rear edges may be accommodated. The lateral position of each side guide relative to the table may also be adjusted by loosening the knurled nut 53 and sliding the supporting block 51 in the slot 50.

A flexible conduit leading from a controlled supply of fluid under pressure is adapted to be connected to the nipple 17, to deliver air to the bellows 14, to support the table or platform 22. Suitable means may be provided in this air line for delivering controlled amounts of air to the bellows, to raise the table, as the sheets are removed from the top of the stack carried thereby. The above identified application shows one system for controlling the delivery of air to the bellows, in accordance with the height of the stack of sheets on the table, to maintain the uppermost sheet in substantially constant, predetermined relation to an associated sheet feeder. The present invention contemplates the use of such a control or any equivalent arrangement.

A sheet feeder of any approved construction may be associated with the table, above the upper, forward end of the same, in the space ahead of the side guides.

The universality of adjustment of the side guides and of the tail guides are features of practical advantage, in the mechanism of the present invention. Also, the way in which the tail guides may be swung between operative and inoperative positions, by simply turning the knobs 61 is of great advantage.

The invention is not limited to the details of construction shown in the accompanying drawings and described above, but includes all modifications coming within the scope of the appended claims and their equivalents.

I claim:

1. A stack supporting feed table for a duplicating machine or the like, comprising a plate in its upper surface adjacent the rear end thereof, a pair of blocks slidable in the slot, means for clamping the blocks in adjusted position in having a transversely extending undercut slot the slot, and an upright, forwardly extending stack side guide plate secured to each of said blocks for angular adjustment with respect thereto independent of said last named means.

2. A stack supporting feed table for a duplicating machine or the like, comprising a plate having a transversely extending undercut slot in its upper surface adjacent the rear end thereof, a pair of blocks slidable in the slot, means for clamping the blocks in adjusted position in the slot, and an upright, forwardly extending stack side guide plate having a laterally turned bottom flange secured to each of said blocks for angular adjustment with respect thereto independent of said last named means.

3. A stack supporting feed table for a duplicating machine or the like comprising a plate supported in forwardly and upwardly inclined relation and having a transverse slot in its upper surface adjacent its rear edge, a pair of inde-

pendent slide blocks in the slot, means for clamping said blocks in adjusted position in the slot, side guides projecting upwardly from the table and secured to said blocks for angular adjustment with respect thereto independent of said last named means, a shaft carried by each side guide for rotation on an inclined axis parallel to the plate, a tail guide secured to each shaft for longitudinal adjustment therealong and adapted to be swung from an upper, outwardly projecting, inoperative position, downwardly and inwardly to an operative position adjacent the inner surface of the associated side guide plate.

4. A stack supporting feed table for a duplicating machine or the like comprising a plate supported in forwardly and upwardly inclined relation and having a transverse slot in its upper surface adjacent its rear edge, a pair of independent slide blocks in the slot, side guides projecting upwardly from the table and secured to said blocks, a shaft carried by each side guide for rotation on an inclined axis parallel to the plate, a tail guide fixed to each shaft and adapted to be swung from an upper, outwardly projecting, inoperative position, downwardly and inwardly to an operative position adjacent the inner surface of the associated side guide plate, said tail guides each having a forward surface disposed in a vertical plane when in the operative position, whereby, as the tail guide is swung in an inclined plane, normal to its supporting shaft, to said operative position, said forward surface moves forwardly into engagement with the rear face of an associated stack.

5. A feed table in accordance with claim 1, in which each of said blocks is of inverted T-section and in which the clamping means for the blocks comprise a thumb nut threaded on a stud projecting upwardly through the slot with the lower face of the nut overlying the adjacent plate surface.

6. A stack supporting feed table for a duplicating machine or the like comprising a plate supported in forwardly and upwardly inclined relation, a pair of side guides projecting upwardly from the table and secured thereto for lateral adjustment, a shaft carried by each side guide for rotation on an inclined axis parallel to the plate, a tail guide fixed to each shaft and adapted to be swung from an upper, outwardly projecting, inoperative position, downwardly and inwardly to an operative position adjacent the inner surface of the associated side guide, said tail guides each having a forward surface disposed in a vertical plane when in the operative

position, whereby, as the tail guide is swung in an inclined plane, normal to its supporting shaft, to said operative position, said forward surface moves forwardly into engagement with the rear face of an associated stack.

7. In a stack supporting feed table for a duplicating machine or the like, having a plate supported in forwardly and upwardly inclined relation and a pair of side guides projecting upwardly from and adjustably secured to said plate, a tail guide pivotally mounted on each of said side guides and adapted to be swung from an upper, outwardly projecting, inoperative position, adjacent the inner surface of the associated side guide plate, said tail guides each having a forward surface disposed in a vertical plane when in the operative position, whereby, as the tail guide is swung in an inclined plane, normal to its supporting shaft, to said operative position, said forward surface moves forwardly into engagement with the rear face of an associated stack.

8. In a stack supporting feed table for a duplicating machine or the like, having a plate supported in forwardly and upwardly inclined relation and a pair of side guides projecting upwardly from and adjustably secured to said plate, a tail guide pivotally mounted on each of said side guides of the character described in claim 7, further characterized in that each tail guide is also secured to its associated side guide for longitudinal adjustment therealong.

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