March 13, 1962 G. F. BRYANT 3,025,055

PRINTING PRESS SHEET FEEDING MECHANISM

Filed May 13, 1959

2 Sheets-Sheet 1

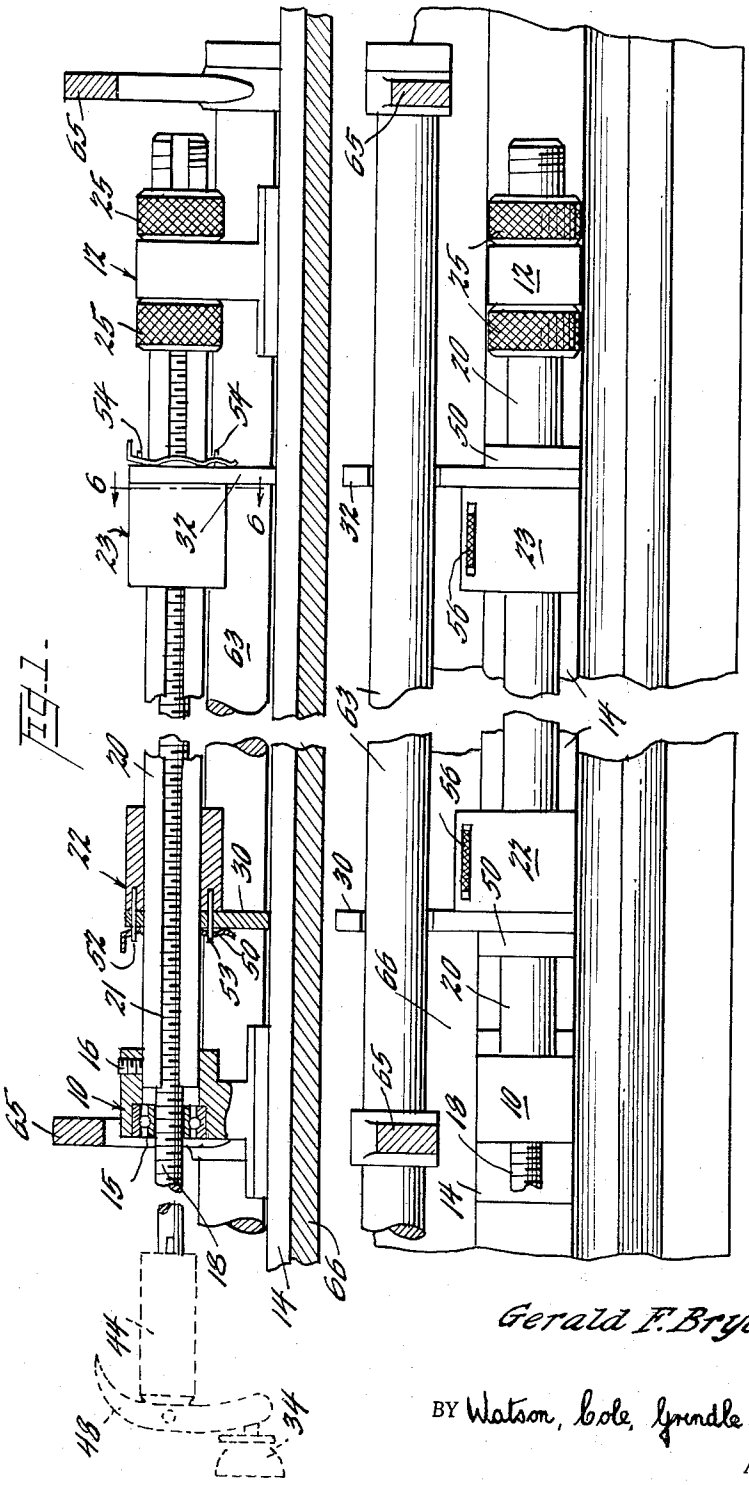


FIG. 1.

FIG. 2.

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FIG. 3.

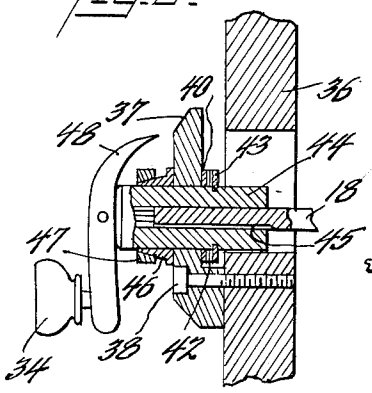


FIG. 4.

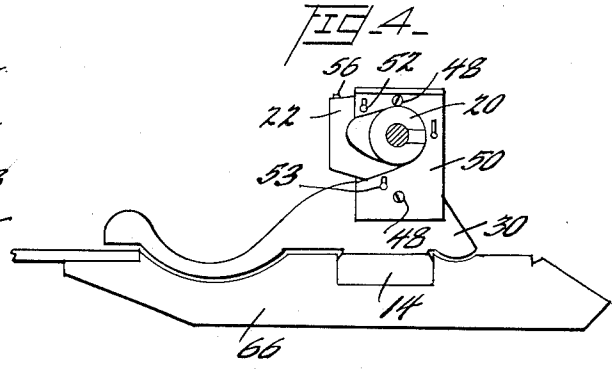


FIG. 5.

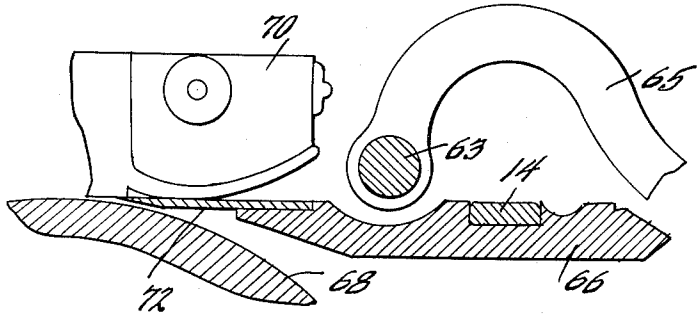
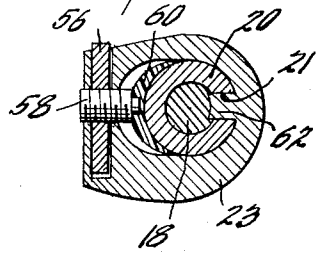


FIG. 6.



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PRINTING PRESS SHEET FEEDING MECHANISM

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8 Claims. (Cl. 271—59)

This invention relates to sheet guiding mechanisms for presses and more particularly to sheet side guide mechanisms for offset presses.

Known types of presses are equipped with push type side guides for guiding sheets into an offset press. These devices employ a side guide bar with tapped holes and guides located on the bar by screws which selectively engage these tapped holes. In order to adjust the guide for different size sheets, the screws are removed and inserted in different ones of the tapped holes. The guide also has a micrometer adjustment which may be used to move the sheet into register. Two of these side guides are supplied with the press, one for the feeder side and one for the gear side. These guides must be individually located with respect to the tapped holes and each adjusted by individual micrometers. Further adjustments can be made only when the press is stopped.

In locating the side guides, the operator jogs the sheet down to the head stops or front guides. The operator continues to jog the press until the side guide bar continues its stroke toward the center of the press and stops. The side guide to be employed is then located so that it will be square with the sheet and will move the sheet sidewise a predetermined distance, for example, 3/16 of an inch. If the sheets are to be fed through a second time, such as to print on the reverse side of the paper, then the guide on the gear side must be located. To accomplish this the operator must walk around the press, reach into the press with a wrench, remove the side guide holding screw and move it to a new tapped hole and secure it in position by means of the wrench. Finally, the operator must adjust the micrometer adjustment on the gear side and return to the feeder side and operate the press.

This type of sheet feeder mechanism, and particularly this type of side guide, exhibits numerous disadvantages. For example, these side guides are subject to numerous types of important operation. Since the side guide bar has numerous holes passing through the bar, it is possible for dirt to enter these holes and prevent the guide bar from working free in the slot. Further, the nuts employed to lock the side guides onto the side guide bar are inaccessible and either a long wrench is required to reach down through the dampening unit or it is necessary to move the dampening unit from over the side guide bar to permit locking of these nuts with a wrench. Further, it is possible that the side guides might not be securely fastened to the guide bar. Accordingly, play would exist between the movement of the side guide and the side guide bar, causing improper guiding of the sheets. Further, the operators often strip the threads on the nuts which secure the side guides to the side guide bar and these nuts work loose and go through the press, causing numerous holes to be dug in the cylinders. Still further, it is possible that the side guides may not be square with the front guides and, accordingly, the paper would be positioned to go through the press at an angle.

Accordingly, it is an object of this invention to provide an improved sheet guiding mechanism which obviates the above mentioned disadvantages.

It is another object of this invention to provide a press with a guiding mechanism such that both side guides can be accurately positioned from the feeder side of the press.

It is another object of this invention to provide a sheet guiding mechanism which permits easy, accurate and rapid adjustment.

It is another object of this invention to provide a sheet guiding mechanism for a press which obviates the necessity for locking and releasing the side guide securing mechanism.

It is a further object of this invention to provide a sheet guiding mechanism with a pair of side guides, both of which may be finely adjusted from the feeder side of the press and may be adjusted while sheets are being fed through the press.

Briefly, in accordance with aspects of this invention, a sheet guiding mechanism is provided with a bar on which a pair of side guides are slidably mounted. The bar is provided with a pair of locking screws on either side of one of the bar supporting posts so that the bar may be moved short distances relative to the posts and locked in these translated positions to thus control the fine adjustment of either of the side guides from the feeder side. This adjustment may be made while sheets are being fed through the press. Advantageously, a fine scale may be marked on the side of the bar so that accurate, fine adjustments may be easily made.

In accordance with other aspects of this invention, the side guides are provided with a surface which acts as a hold-down finger so that two of the hold-down fingers normally employed on the press may be obviated. Thus, it will be unnecessary to move the hold-down fingers out of the path of the side guides when the side guides are being adjusted.

In accordance with other aspects of this invention, a hand wheel is connected to a threaded rod and the threaded rod passes through the carriage track, or carriage supporting rod. Advantageously, the carriage track has a slot extending throughout its length to permit the side guide supporting carriages to engage the threads on the threaded rod. Accordingly, rotation of the handwheel located on the feeder side of the press causes both of the side guides to move relative to the carriage track. Advantageously, the threaded rod is reversedly threaded from the center, that is, the threads run in opposite directions from the center of the rod such that rotation of the threaded rod causes both of the guides to move in the same direction relative to the center line of the press.

In accordance with still other aspects of this invention, the side guide supporting carriage has a C-shaped nylon shoe which encircles the carriage track 26 and a locking nut is employed to apply pressure radially of the C-shaped shoe in a direction toward the threaded rod such that the carriage may be quickly and easily released from the threaded rod and moved to a new position relative to the threaded rod, at which new position the locking nut is employed to secure the C-shaped shoe to the threaded rod such that rotation of the threaded rod will again control the positioning of the side guide.

In accordance with still other aspects of this invention, the threaded rod is splined on the end which engages the drive wheel or drive handle such that the rod may be moved transversely with respect to the drive wheel by means of the micrometer lock nuts located adjacent the guide rod supporting head or bushing.

In accordance with further aspects of this invention, the side guide has a configuration which corresponds to the outer contour of the side guide supporting carriage such that the side guide may snap onto the carriage. Advantageously, the side guide is provided with a locking plate which may be employed to lock the side guide onto the carriage. Accordingly, it is easy to remove the side guide not in use from the carriage for the purpose of running a sheet "out of center" of the press. This means

that, in the event it is necessary to remove the guide not in use due to the sheet being run off-center of the feed board to maintain printing position on the sheet, this is accomplished by unsnapping the guide. Unless this occurs, it is not necessary to remove the guides at any time.

Accordingly, it is a feature of this invention to provide a sheet guiding mechanism for a press with a side guide supporting bar, a pair of side guides mounted on the supporting bar and an arrangement for transversely moving the supporting bar relative to the press so that either one of the side guides are accurately positioned from the feeder side of the press.

It is a further feature of this invention to mount a pair of side guides on a side guide supporting bar to provide these side guides with individual screws passing through the side guides to engage the supporting bar and thus provide for individual primary adjustment of the positioning of the side guides relative to the supporting bar.

It is another feature of this invention to provide a sheet guiding mechanism with a pair of bushings, a side guide supporting bar slidably mounted in the bushings, a pair of side guides individually secured to the supporting bar and a pair of threaded nuts engaging the supporting bar on either side of one of the bushings such that adjustments of these threaded nuts translate the position of the supporting bar relative to the bushings to thereby accomplish fine adjustment of a predetermined one of the side guides.

It is still another feature of this invention to provide a side guide with a surface corresponding to that of a hold-down finger such that the contoured surface is always in a position of co-operation with the side guide, thus eliminating the necessity of two of the hold-down fingers and insuring proper guiding of the sheets regardless of the thickness of the sheets.

It is another feature of this invention to provide a sheet guiding mechanism with a pair of bushings, a side guide supporting bar slidably mounted in the bushings, a pair of side guides slidably mounted on the supporting bar and a screw device for simultaneously moving both of the side guides in the same direction relative to the center of the press.

It is another feature of this invention to provide a sheet guiding mechanism with a side guide supporting rod and a threaded rod for moving both of the side guides in the same direction relative to the center of the press by rotation of the threaded rod. The threaded rod is splined on one end to permit transverse movement of the rod relative to the bushing supporting the rod, thus permitting a fine adjustment of a predetermined one of the side guides relative to the center of the press.

It is another feature of this invention to provide a sheet guiding mechanism with a side guide supporting carriage which rides upon a supporting rod, which carriage is provided with a locking screw movable in a radial direction with respect to the threaded rod to securely engage a nylon C-shaped member against the carriage track, thereby causing the carriage to be translated relative to the center line of the press when the threaded rod is rotated.

It is another feature of this invention to provide a sheet guiding mechanism with a side guide supporting rod, which rod has a slot extending the length of the rod to permit the side guide supporting carriage to project through the slot and engage the threaded rod within the support rod, thus causing the carriage to be translated relative to the supporting rod in response to rotation of the threaded rod.

It is a still further feature of this invention to provide a side guide supporting carriage with a side guide which can be readily removed from the carriage, replaced on the carriage and locked into position.

It is still another feature of this invention to provide a printing press side guide mechanism with a carriage track, a pair of carriages on the track, a side guide removably mounted on each carriage and a rod threaded in opposite directions from the center and coupled to each of the carriages for movement of the carriages in the same direction relative to the center of the rod in response to rotation of the rod, one side guide being removed from its carriage depending upon which side of the sheet is used for registration.

These and various other objects and features of this invention will be more clearly understood from the reading of the detailed description of this invention in conjunction with the drawings, in which:

FIG. 1 is a view in elevation of one illustrative embodiment in this invention showing in full lines the side guide mechanism, and in dotted lines the handle for adjusting the side guide mechanism;

FIG. 2 is a plan view of the full line portions of FIG. 1;

FIG. 3 is a view in elevation partly in section of the handle mechanism for adjusting the side guides;

FIG. 4 is a side view in elevation of the side guide mechanism showing its mounting on the register plate;

FIG. 5 is a side view, partly in section of portions of the press with portions of the guiding mechanism removed; and

FIG. 6 is a side view in section taken along the lines 6—6 of FIG. 1.

Referring now to FIGURES 1 and 2, there are depicted views in elevation and plan respectively, of one illustrative embodiment of this invention. This embodiment includes a pair of mounting posts **10** and **12** secured to opposite ends of the side guide bar **14** by suitable means (not shown).

As is well known in the art, the side guide bar **14** reciprocates in a direction transverse to the direction in which the sheet is being fed, each time that a sheet is fed into the roller.

A suitable ball bearing **15** is mounted in mounting post **10** and is held in position by a suitable locking screw **16**.

A threaded rod **18** passes through the bearing **15** and extends substantially throughout the length of the carriage track **20**. Advantageously, the carriage track **20** is mounted in mounting posts **10** and **12** and has a transverse slot **21** extending the entire length of the carriage track **20** to permit cooperation of the threaded rod **18** and carriages **22** and **23** slidably mounted on the carriage track **20** in a manner which will be substantially explained. The pair of locking nuts **25** are provided on the rod or carriage track **20** and threadably engage the carriage track **20** on either side of mounting post **12**.

The purpose of these locking nuts is to initially position the carriage track **20** and secure it in this position. After the rod **20** is secured in this initial position, the locking nuts **25** are tightened against the mounting post **12** and locking screw **16** in mounting post **10** is tightened. All subsequent positioning of the side guide carriages **22** and **23**, and the side guides **30** and **32** connected thereto, respectively, is accomplished by rotation of the threaded rod **18**.

Advantageously, rod **18** is threaded in opposite directions from the center of the rod, such that rotation of the handle by means of the handle **34** shown in dotted lines, will cause carriages **22** and **23** to move in the same direction relative to the center of the rod. For example, if the handle **34** is rotated in a clockwise direction, carriages **22** and **23** will move away from the center of rod **18**. Similarly, counter-clockwise rotation of rod **18** causes carriages **22** and **23** to move towards the center of the rod **18**.

As best seen in FIGURE 3, the side of the press **36** supports a dial **37** which is secured to the press by suitable means such as by threaded bolt **38**, as shown. A fiber washer **40**, a spring tension washer **42**, and a snap lock ring **43** are positioned in that order between the dial **37** and the side of the press **36** to permit rotation of the collar **44**, which is secured to the handle **34**. Advantageously, the end of threaded rod **18** is splined at **45** and

engages the similar splined aperture in the sleeve 44, such that sleeve 44 and rod 18 will be rotated in response to rotation of the handle 34, while transverse movement of the rod 18 relative to the sleeve 44 is permitted. This translation takes place during the initial fine adjustment of the carriage track 20 previously described, and also during each reciprocation of the side guide bar 14. As previously mentioned, side guide bar 14 reciprocates each time a sheet is fed into the impression rollers. A lock bushing 46 and a lock nut 47 engaging the outer periphery of bushing 46 are employed to lock the bushing 46 on sleeve 44.

The accuracy of the setting of handle 34 is facilitated by the indicator arm 37, which counter balances the handle 34 and depends from the handle 34 in the region of dial 37. It is of course understood that one side guide is employed at a time, depending on which side of the sheet is to be employed for achieving registration. The other side guide may be disengaged from its carriage in a manner which will be subsequently described, or alternatively the carriage may be disengaged from the threaded rod 18 and moved to an extreme terminal position out of the path of the sheet being fed in a manner which will also be subsequently described. If at any time it is desired to adjust one of the side guides 30 or 32, the handle 34 is rotated to rotate the threaded rod 24 until the desired position of the side guides 30 or 32 is achieved.

Advantageously, the side guides, such as guide 30, are provided with a side guide locking plate 50 as best seen in FIGURES 1 and 4. The side guide 30 and the lock plate 50 are provided with apertures to receive pins such as 52 and 53 projecting from the side of carriage 22. When the side guide locking plate 50 is raised, the holes or apertures in the side guide locking plate 27 are aligned with the holes of the side guide 30, when the side guide is placed on these pins such as 52 and 53, the locking plate is depressed to engage the ends of pins 52 and 53 and thus secure the side guide 30 in position. A similar locking plate is provided on side guide 32 to engage the pins 54 depending from carriage 33 and is best seen in FIGURE 1. This disengageable arrangement of the carriage and side guide facilitates an off-center running of sheets. In other words, one of the side guides is removed by raising the locking plate 50 and the other side guide is employed to position the sheet.

As best seen in FIGURE 6, the carriage 23 has a thread nut 56 which threadably engages a shaft 58 positioned radially with respect to carriage track 20. Advantageously, the threaded rod 58 engages a nylon C-shaped shoe 60 and presses shoe 60 into engagement with carriage track 20. The carriage 23 has a tongue 62 which projects into the slot 21 and the rod or carriage track 20. Tongue 62 threadably engages the threads of the rod 18 when the nut 56 is rotated to drive the shaft 58 and the nylon collar into cooperation with the rod or carriage track 20. If however, the threaded nut is released or rotated in the opposite direction moving the rod 58 radially away from the carriage track 20, the nylon shoe 60 is disengaged from the rod 20 and the tongue 62 is disengaged from the threads of the rod 18. It is now possible to freely move the carriage 23 relative to the rod 20 such as for an initial or primary adjustment of the positioning of the side guide 32 or for moving the side guide 32 to its extreme terminal position.

When the primary adjustment is achieved, the threaded nut 56 is again tightened to drive the tongue 62 into engagement with the threaded rod 24 and adjustment of the carriage 23 relative to the carriage rack 20 may now be achieved by rotation of the handle 34, which adjustment may be accomplished while the press is running. Advantageously, the threaded rod 18 may have a prescribed number of threads per inch such that one revolution of the handle 34 will move the side guide 32 a predetermined distance. For example, if there are eight threads per inch on the rod 18, then the side guide 32 will move ⅛ of an inch per revolution of the handle 34.

FIGURE 5 shows a side view of a portion of the press in which the side guide is placed. The corrugating bar 63 is supported by a pair of arcuate arms 65. The side guide bar 14 reciprocates in a channel in register plate 66 into and out of the viewing plane as viewed in FIGURE 5. The arcuate ends of the side guides 30 and 32 extend beneath the corrugating bar 63 as best seen in FIGURES 1 and 2. The impression cylinder 68 is positioned at the front edge of the register plate 66. The front guide 70 is positioned above the under tongue 72 of register plate 66 and periodically moves into position to stop the sheet as the sheet moves forward towards the impression roller 68.

FIGURE 4 shows the register plate 66 with the side guide bar 14 shown in elevation and with the side guide 30 shown in its operative position in which the side guide 30 is secured to the carriage 22 by means of pins such as 52 and 53 and the locking plate 50 previously described. Advantageously, locking plate 50 may be provided with guide screws such as 48 to guide the movement of the locking plate relative to the side guide. If FIGURE 4 were superimposed on FIGURE 5 the clearances and operative relationships of the parts of this side guide would be apparent.

From the foregoing explanation, it will be apparent that these forms of sheet guiding mechanisms obviate the numerous disadvantages of the prior art devices by providing side guides which can both be accurately adjusted from the feeder side of the press and can accurately be positioned without the use of tools while the operator manipulates the press controls and observes the positioning of the side guides. It will also be apparent that by eliminating the use of screws which threadably engaged tapped holes in the side guide bar, the possibility of admission of dirt through the side guide bar into the slot in the register plate, and thus impeding the free movement of the guide bar, will be obviated. It will also be apparent that with this arrangement of side guides on a side guide supporting bar the possible misalignment of the side guides relative to the direction of sheet feeding will be obviated.

While I have shown and described various embodiments of my invention, it is understood that the principles thereof may be extended to many and varied types of machines and apparatus. The invention, therefore, is not to be limited to the details illustrated and described herein.

What is claimed is:

1. A sheet guiding mechanism for a printing press comprising a side guide bar mounted for reciprocation on said press each time a sheet is fed into the cylinders of the press, a pair of mounting posts connected to said side guide bar in spaced relationship, carriage track means mounted in said mounting posts, a carriage slidably mounted on said carriage track means, side guide means mounted on said carriage, translating and locking means for accurately positioning and locking said carriage track means relative to said side guide bar, screw means coupled to said carriage for translating said carriage relative to said carriage track means when said carriage track means is locked relative to said side guide bar.

2. A sheet guiding mechanism according to claim 1 further comprising means for releasing said side guide means from said carriage.

3. A sheet guiding mechanism according to claim 1 wherein said screw means includes a threaded rod rotatably mounted in said carriage track means and coupled to said carriage and handle means connected to said rod for translating said side guide relative to said side guide bar in response to rotation of said handle means.

4. A sheet guiding mechanism according to claim 3 wherein said threaded rod extends substantially the entire length of said carriage track means and is threaded

in opposite directions from its center, a second carriage on the opposite side of the center of said rod from said first carriage and having side guide means thereon, whereby rotation of said threaded rod causes translation of each of said side guide means in the same direction relative to the center of the press.

5. A sheet guiding mechanism according to claim 4 wherein said handle includes a crank arm, a pointer depending from said crank arm and scale means positioned adjacent the path of said pointer whereby rotation of said crank arm accurately positions said side guide means relative to said side guide bar.

6. A printing press sheet guiding mechanism comprising a register plate on said press, a side guide bar reciprocally mounted on said register plate, a pair of apertured mounting posts secured to said side guide bar in spaced relationship, carriage track means slidably mounted in said mounting posts, said carriage track means having a slot therein extending the entire length thereof and screw means rotatably mounted in said carriage track means, a carriage slidably mounted on said track means and a side guide connected to said carriage, a tongue-shaped portion on said carriage for engaging said screw means through said slot whereby said carriage is translated along said carriage track means in response to rotation of said screw means.

7. A sheet guiding mechanism according to claim 6

wherein each carriage has a longitudinally translatable shaft positioned radially of said screw means, translating means on said shaft, a sleeve positioned on the end of said shaft to engage said carriage track means whereby actuation of said translating means causes said tongue-shaped portion to engage said screw means.

8. A sheet guiding mechanism according to claim 7 wherein said screw means includes a threaded rod having a spline on one end thereof and further comprises a splined collar engaging said splined rod, whereby rotation of said splined collar rotates said threaded rod while permitting transverse movement of said carriage track means relative to said collar, said carriage track means being threaded on one end thereof, said mechanism including a pair of locking nuts threadably engaging said track means on opposite sides of one of said mounting posts to permit the adjustment and locking of said carriage track means relative to said mounting posts.

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