May 31, 1960 H. E. PAULSON 2,938,723

SIDE GUIDE REGISTER FOR SHEET FEEDERS

Filed July 17, 1958 3 Sheets-Sheet 1

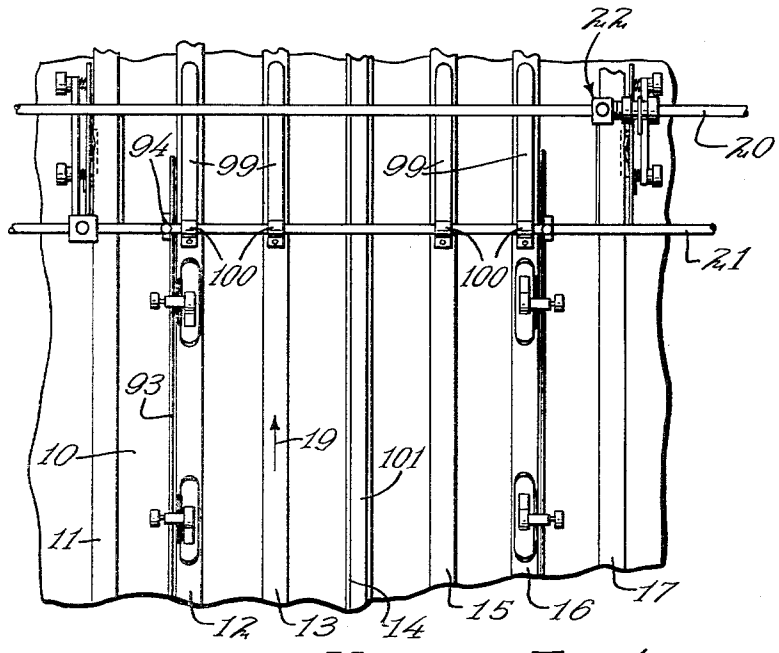



FIG. 1

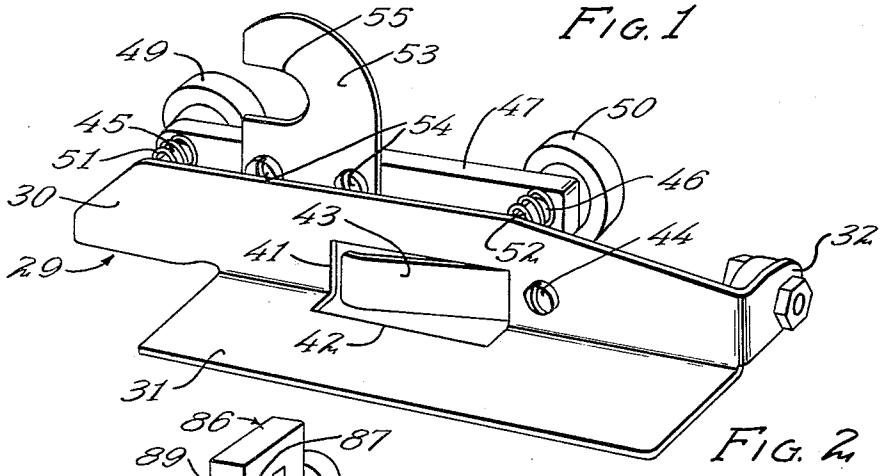



FIG. 2

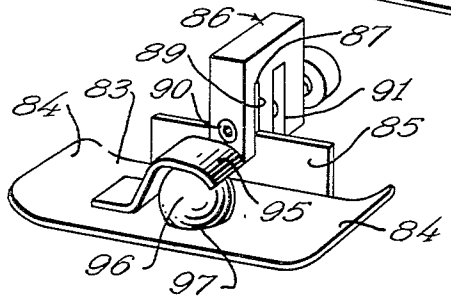



FIG. 12

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SIDE GUIDE REGISTER FOR SHEET FEEDERS

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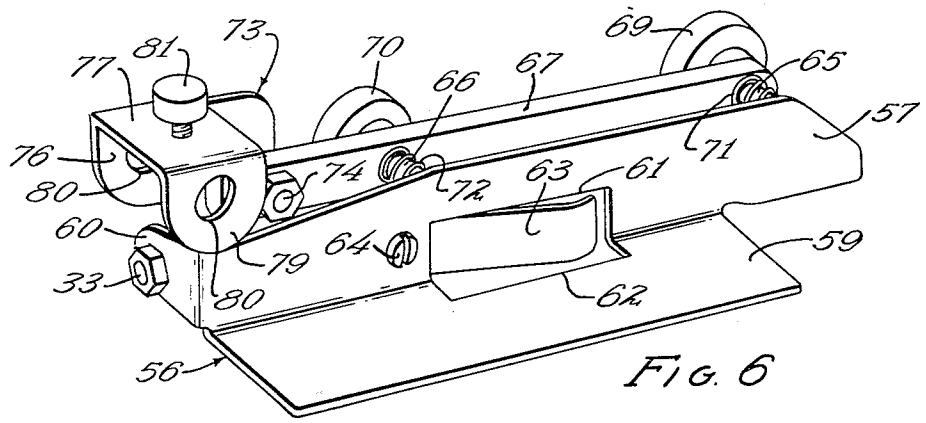



FIG. 6

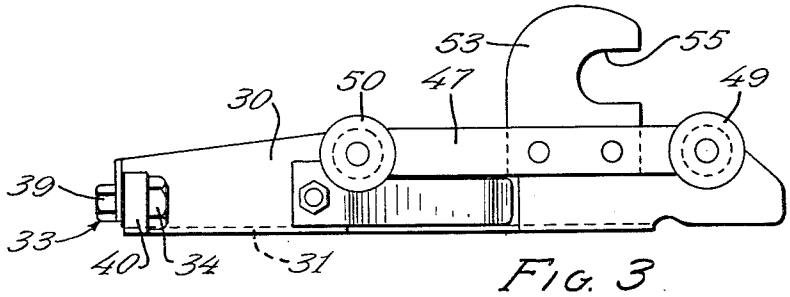



FIG. 3

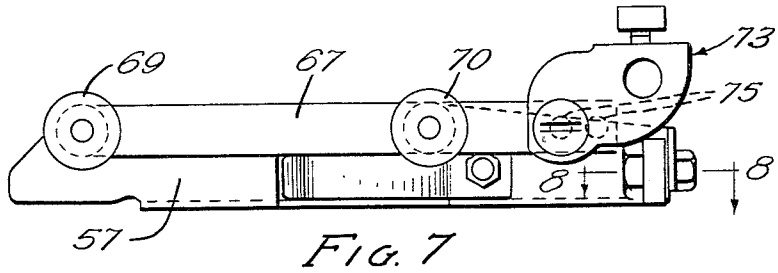



FIG. 7

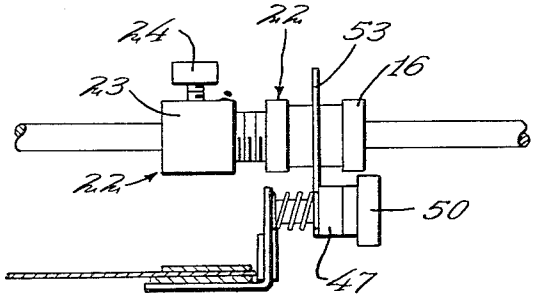



FIG. 4

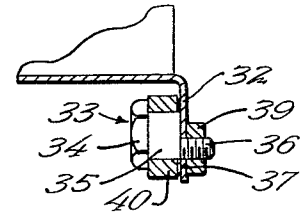



FIG. 8

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SIDE GUIDE REGISTER FOR SHEET FEEDERS

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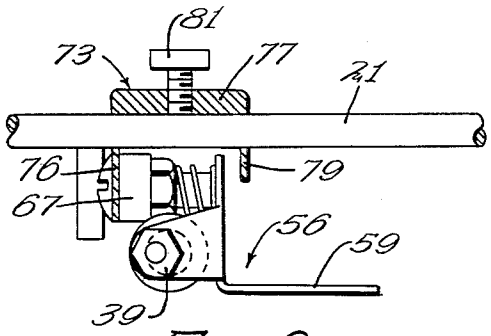



FIG. 9

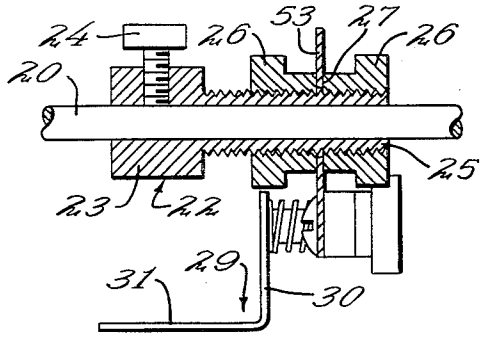



FIG. 5

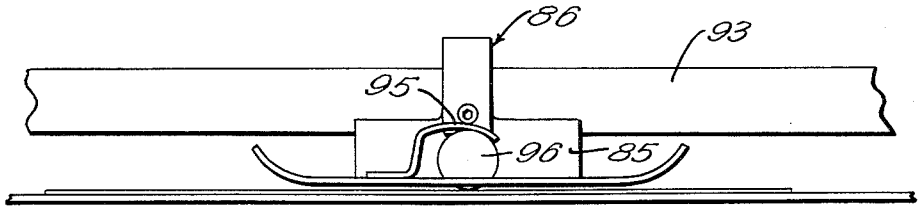



FIG. 11

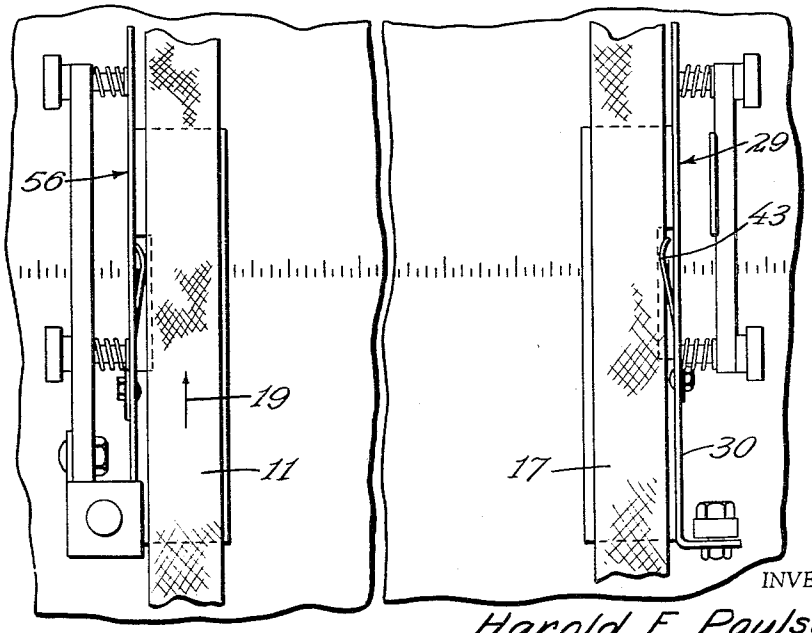



FIG. 10

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2,938,723

# SIDE GUIDE REGISTER FOR SHEET FEEDERS

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14 Claims. (Cl. 271—49)

This invention relates to an improvement in side guide register for sheet feeders and deals particularly with a sheet registering device which provides an extremely accurate guide for sheets being fed into an offset printing press and the like.

Considerable difficulty is experienced in providing an accurate adjustment for sheets being fed by movable belt into an offset printing press. In many presses of this type, one edge of the sheet is registered by means of a device commonly known as a jogger. This device includes an adjustable collar movable transversely of the feed table and supporting a pair of threaded adjustment nuts which support a light curved spring. This curved spring is designed to engage against an edge of the sheet to form a side guide. Considerable difficulty is often experienced in properly registering the sheets by means of this single light spring. This is particularly true when it is understood that sheets of various thicknesses may be printed on the presses. An extremely fine adjustment is required if the device is to properly register both sheets of the thickness and strength of tissue and other sheets which are of substantial thickness and strength. Usually, the belts and guide springs overlying the belt must be very carefully positioned if the sheets are to be accurately registered.

A feature of the present invention resides in the provision of a pair of guides between which the sheets are fed to provide an extremely accurate register thereof. The registering means includes normally one side guide which actually provides the register and incorporates a light spring which is retractable to the side edge of the guide. This side guide is mounted upon the adjustment nut which normally supports the jogger spring and replaces this spring. The other side guide comprises a somewhat similar structure which is fixed in adjusted position under normal conditions but which in itself is laterally adjustable to provide a fine adjustment.

A feature of the present invention resides in the provision of a pair of side guides which are so constructed that the guide actually used as the side register may be positioned for engagement with either side of the sheet. By merely interchanging the supporting means for the side guides, the adjustable registering guide may be arranged to contact either edge of the sheet.

A further feature of the present invention resides in the provision of a pair of side guides which are normally supported in parallel relation but which are adjustable so that one guide may be angularly related relative to the other for use in the feeding of sheets of odd sizes and shapes.

A further feature of the present invention resides in the provision of a pair of accurate side guides which may be used to replace the jogger spring normally used for the side register of the sheets without changing or modifying the feeder. The side guides are also constructed in such a manner as to be applicable to numerous models of offset presses of the type described.

A further feature of the present invention resides in



the provision of a side guide having a horizontal flange designed to extend beneath one of the feed belts and which is adjustable in elevation so as to raise or lower the horizontal flange of the side guide as well as the remainder thereof.

A further feature of the present invention resides in the provision of a pair of side guides including a body portion including a horizontal flange and a vertical flange arranged in right angular relation so that the horizontal flange may extend beneath a feed belt and the vertical flange may extend alongside of the feed belt. A spring is mounted intermediate the ends of the vertical flange and is designed to extend against the edge of the sheet with an extremely light pressure. The spring is rectractable into the vertical flange so as to guide the sheet along the surface of the vertical flange while applying a light pressure to the sheet.

An additional feature of the present invention resides in the provision of a supporting member which is supported parallel to the direction of movement of the sheets and which is adjustable laterally thereof. The angular body of the guide is connected to the supporting member by a pair of longitudinally spaced adjustment screws which permit the angle of the guide body to be adjusted into or out of parallel relation with the support.

Another feature of the present invention resides in the provision of an eccentric mounted at one end of the guide body at the end thereof opposite the registering side guide. By rotating the eccentric, the elevation of the guide body may be varied.

A further feature of the present invention resides in the provision of a side guide having a portion of the body thereof cut away to provide a spring aperture through which a portion of the feed table may be seen. As the feed table is provided with laterally spaced gauge marks, an accurate alignment of the body of the guide relative to the gauge marks may be obtained by looking through this cut away portion of the guide.

Still another feature of the present invention resides in the provision of a web foot used in conjunction with the side guide and which includes a ball or marble extending partially through a curved plate. A spring is provided overlying the pressure ball, the spring being sufficiently ductile to be bent to provide added pressure upon the ball while still being resilient within the limits of normal operation.

A further feature of the present invention resides in the fact that while both side guides include similar parts and each includes a spring, the spring of the normally stationary side guide may be bent out of operative position when not being used for register.

present invention will be more clearly and fully set forth in the following specification and claims:

These and other objects and novel features of the

In the drawings forming a part of the specification:

Figure 1 is a diagrammatic view of a feed table showing a series of feed belts, and a pair of transversely extending supporting rods extending over the table from which the side guides, the web feet, and the pressure springs may be supported.

Figure 2 is a perspective view of the registering side guide removed from the press.

Figure 3 is a side elevational view of the side guide shown in Figure 2.

Figure 4 is an end elevational view of the side guide shown in Figures 2 and 3 and showing the manner in which this registering guide is adjustably supported.

Figure 5 is a cross sectional view through the adjustment means for providing lateral adjustment of the registering guide.

Figure 6 is a perspective view of the normally stationary side guide.

Figure 7 is a side elevational view of the side guide shown in Figure 6.

Figure 8 is a sectional view through the elevation adjustment, the position of the section being indicated by the line 8—8 of Figure 7.

Figure 9 is an end elevational view of the side guide shown in Figures 6 and 7, a portion of the guide being broken away to disclose the construction thereof.

Figure 10 is a plan view of a portion of the feed table in enlarged form, showing the indicating marks used in positioning the guides.

Figure 11 is a side elevational view of a web foot showing the construction thereof.

Figure 12 is a perspective view of the web foot shown in Figure 11.

Figures 1 and 10 of the drawings diagrammatically illustrate a feed table **10** having a series of laterally spaced conveyor belts **11**, **12**, **13**, **14**, **15**, **16** and **17** extending thereover. It will be understood that these belts are mounted upon spaced parallel pulleys, the upper portions of the belts moving in unison to carry the sheets to the press. The conveyor belts are moving in the direction of the arrow **19** as viewed in Figures 1 and 10.

A pair of supporting bars **20** and **21** are supported by the frame of the press, not illustrated in the drawings, to extend transversely of the direction of movement of the conveyor belts. The bar or rod **20** supports the adjustment mechanism **22** for one side guide. This adjustment mechanism may be best seen in Figures 4 and 5 of the drawings.

With particular reference to Figure 5, the adjustment mechanism **22** includes a collar **23** axially slidable on the rod **20** and held in adjusted relation thereto by a thumb screw **24**. The collar **23** is provided with an integral externally threaded sleeve **25** also encircling the rod **20**. A nut **26** having an external peripheral groove **27** acts to support the registering guide. Alternatively, the support may include two nuts **26** which engage on opposite sides of the side guide support to hold it in an adjusted position.

With reference now to Figures 2 through 5 of the drawings, the registering guide **29** includes an angular body including a vertical flange **30** and a horizontal flange **31**. The vertical flange **30** is provided with a right angularly turned extremity **32** which supports a bolt **33** having a head **34**, (Figure 8) a cylindrical body adjoining the head **34** and designated by the numeral **35**, and an eccentric threaded shank **36**. The threaded shank **36** extends through a suitable aperture **37** in the flange extremity **32** and is held in adjusted position by a nut **39**. By loosening the nut **39** and rotating the bolt about its shank **36**, the cylindrical portion **35** may be raised and lowered. A sleeve **40** is rotatably supported upon the cylindrical portion **35** and normally bears against the feed table **10** outwardly of the various belts **11** through **17**.

Near the center of the vertical flange **30** an aperture **41** is provided of generally rectangular outline extending to the juncture between the vertical flange **30** and the horizontal flange **31**. An adjoining aperture **42** is provided in the horizontal flange **31** so that a portion of the feed table is visible therethrough. A spring **43** of the leaf spring type is bolted to the vertical flange **30** as indicated at **44**, the bolt head of the bolt **44** being above the level of the sheets. The flat spring **43** is of very light weight spring material and exerts a very gentle pressure against the edge of a sheet moving along the vertical flange **30**. The lower edge of the spring **43** is below the level of the surface of the conveyor belt **17** which overlies the horizontal flange **31** and accordingly is engageable with the edge of a sheet carried by the conveyor belts. As indicated in Figure 10 of the drawings, the belt **17** has its outer edge in spaced relation to the vertical flange **30** so as not to interfere with the operation of the spring **43**.



The outer surface of the vertical flange **30** is provided with a pair of spaced parallel threaded studs **45** and **46** having their axes normal to the plane of the flange **30**. A supporting bar **47** is slidably supported upon the studs **45** and **46**, the studs extending through apertures in the bar. Nuts **49** and **50** are provided on the studs **45** and **46** respectively and may tighten to decrease the distance between the bar **47** and the flange **30**. Springs **51** and **52** are interposed between the flange **30** and the bar **47** to normally urge these members apart.

A mounting bracket plate **53** is bolted or otherwise secured as indicated at **54** to the bar **47** to extend upwardly therefrom. This plate **53** is provided with a lateral notch **55** of proper dimensions to fit in the groove **27** or between the clamping nuts **26** and to partially encircle the shank **25** of the collar **23**. By adjustment of the nut or nuts **26**, the lateral position of the bracket plate **53**, the supporting bar **47**, and the entire side guide **29** may be laterally adjusted.

With reference now to Figures 6 and 7 of the drawings, it will be noted that the normally stationary side guide has many parts which are identical with the parts of the side guide **29**. The side guide **56** includes an angular body including a vertical flange **57** and a horizontal flange **59** which are connected at right angles and which are opposite or in reversed arrangement to the flanges **30** and **31** of the side guide **29**. The vertical flange **57** is provided with a right angularly turned extremity **60** which accommodates an eccentric adjustment **33** identical to that previously described. The vertical flange **57** is provided with a generally rectangular aperture **61** adjoining the lower edge thereof and the horizontal flange **59** is provided with a communicating aperture **62** through which a portion of the feed table can be viewed. A flat spring **63** is bolted or otherwise secured to the vertical flange **57** by means of the bolt **64**. Fixed studs **65** and **66** are provided on the vertical flange **57** to project with their axes normal to the plane of the flange **57**. It is important to note that the spacing between the studs **65** and **66** is identical to the spacing between the studs **45** and **46**.

An elongated supporting bar **67** is slidably supported upon the studs **65** and **66** and clamping nuts **69** and **70** are provided on the studs **65** and **66** to move the supporting bar **67** toward the vertical flange **57**. Springs **71** and **72** are interposed between the vertical flange **57** and the supporting bar **67** to normally urge these elements apart.

A mounting bracket **73** is attached to the supporting bar **67** by a bolt **74** which extends through one of a pair of apertures **75** in the bar **67**. The bracket **73** includes a channel shaped structure including a vertical side **76** which is attached to the bar **67**, a horizontal connecting member **77**, and a downturned flange **79** parallel to the side **76**. The sides **76** and **79** are provided with aligned apertures **80** extending therethrough designed to accommodate the cross bar **21** on the frame of the press. A thumb screw **81** is threaded through the connecting member **77** and engages against the rod **21** to hold the mounting bracket **73** and the remainder of the side in fixed relation upon this rod.

It will be noted that the body of the side guide including the vertical flange **57**, the horizontal flange **59**, the angularly turned extremity and adjustment member **33**, and the spaced studs **65** and **66** are identical to the corresponding parts of the side guide **29** but are reversed therefrom. In the particular arrangement illustrated, the fixed guide **56** forms a guide for the left hand side of the paper while the side guide **29** forms a means of registering the right hand edge of the paper. If it is desired that the registering or adjustable guide be on the left side of the sheet, and the fixed guide on the right, the thumb nuts **69** and **70** are removed, and the supporting bar **67** and its associated parts are substituted for the mounting bar **47** and associated parts of the

guide 29. Thus, either side may be used as the registering side guide.

With reference now to Figures 11 and 12 of the drawings, the pressure applying devices which are known as web feet include a pressure shoe 83 having upturned ends 84 to guide the paper sheets beneath the shoe. A vertical flange 85 is provided along one edge of the shoe 83 and a bracket 86 is attached to the flange 85, the flange 85 extending into a notch 87 in the bracket 86 and held in place therein. The flange 85 includes an upwardly projecting ear 89 which extends to the top of the slot 87 and is held in place by a set screw 90. This set screw 90 permits vertical adjustment of the web foot relative to its supporting bar which adjustment has not been normally available in connection with devices of this type. A second vertical notch 91 is provided in the bracket 86 to accommodate a supporting bar 93 which is adjustably connected by a bracket 94 to the rod 21. As the rod 93 and bracket 94 are common on devices of this type, the details are not illustrated.

A spring leaf 95 is secured to the upper surface of the shoe 83 and overlies a ball or bearing 96 which extends partially through an aperture 97 in the center of the shoe. If the spring 95 is bent upwardly to some extent, the ball will be held in place merely by the weight of the ball itself. The spring 95 is of sufficiently ductile material to permit it to be bent. When pressed downwardly, pressure is applied to the top of the ball which in turn applies additional pressure downwardly against the sheets.

As is usual in feed devices of this type, elongated spring fingers such as 99 are provided with clamps 100 at one end thereof which are slidable on a cross bar such as the bar 21. These springs are designed to flex down against the surface of the conveyor belt to hold the sheets in contact therewith. Certain of such leaf springs 101 may be considerably longer than others so as to hold the sheets in place over a greater proportion of the feed table. The springs 101 may be provided with clamps such as 100 and may be secured to a cross member parallel to the rod 21 and not shown in the drawings.

In accordance with the patent statutes, I have described the principles of construction and operation of my improvement in side guide register for sheet feeders, and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A sheet guide for use in conjunction with a sheet feeding table having a series of substantially parallel conveyor belts, the device including a guide body including a generally horizontal flange designed to extend beneath a conveyor belt and a vertical flange connected thereto and adapted to extend alongside of the conveyor belt, a supporting bar extending in generally parallel relation to said vertical flange, a pair of spaced adjustable connections connecting said vertical flange and said supporting bar by means of which the distance between said vertical flange and said supporting bar may be adjusted, means adjoining one end of said supporting bar for pivotally supporting the bar about a substantially horizontal axis, whereby said guide body may be adjusted relative to said supporting bar.

2. The construction described in claim 1 and including means connected to said guide body and spaced from said means for pivotally supporting said supporting bar for adjusting the elevation of said guide body.

3. The construction described in claim 2 and including a spring blade connected to said vertical flange and extending inwardly in the direction of said horizontal flange for engagement with the side edges of sheets extending over said horizontal flange on the conveyor belt.

4. The construction of claim 2 and in which said means for adjusting the elevation of said guide body comprises a rotatable eccentric and means for holding said eccentric in adjusted position extending beneath the level of said horizontal flange.

5. A sheet side guide register for sheet feeders having a feed table including a series of substantially parallel conveyor belts and a pivot rod extending transversely of said conveyor belts and above the level thereof, the register including a supporting bar, a bracket on said bar near one end thereof pivotally engaging said transverse rod for pivotal movement about and slidable movement along a generally horizontal axis provided by said rod, means associated with said bracket in a preferred position on said rod, an angular guide body including a substantially horizontal flange and a substantially vertical flange connected to an edge of said horizontal flange and extending upwardly therefrom, a pair of studs extending in parallel relation from said vertical flange and having their axes substantially normal thereto, said studs extending through said supporting bar, means on said studs adjustable for varying the distance between said vertical flange and said supporting bar, said horizontal flange being adapted to extend beneath one of the conveyor belts, and a leaf spring connected to said vertical flange and extending inwardly therefrom in the direction of said horizontal flange, said spring being engageable with the edges of sheets extending along said vertical flange.

6. The construction described in claim 5 and in which said vertical flange is provided with an aperture therethrough through which said leaf spring extends.

7. The construction described in claim 5 and including springs encircling said studs and normally urging said vertical flange away from said supporting bar, and in which said adjusting means includes nuts on the ends of said studs and engageable against said supporting bar to draw said vertical flange toward said supporting bar.

8. The construction described in claim 5 and including means on said guide body at a point longitudinally spaced from said bracket on said supporting bar engageable against the feed table for adjustment of the elevation of said guide body.

9. A paper sheet guide for use on press feeders including a feed table including a plurality of substantially parallel conveyor belts movable thereover, the guide means including a pair of angular guide bodies arranged in opposed relation, each guide body having an inwardly directed substantially horizontal flange and a vertical flange connected to the outer edge thereof, a pair of studs projecting outwardly from each of said vertical flanges, a supporting bar extending generally parallel to each said vertical flange and through which said studs extend, springs encircling said studs between said vertical flanges and said supporting bars, the horizontal flanges of both said guides being designed to underlie a conveyor belt, means on one said supporting bar at the end thereof forming the trailing edge of said guide device in the direction of movement of said conveyor belt for pivotally connecting said one supporting bar on a substantially horizontal transverse axis, and means on the other supporting bar at the leading edge of said other guide device pivotally supporting said other guide device about a transverse horizontal axis.

10. The structure described in claim 9 and including a leaf spring secured to the vertical flange of said one guide device and extending inwardly of said vertical flange toward the other guide device engageable with the edges of sheets being guided by the vertical flange of said one guide device.

11. The construction described in claim 9 and including means at the leading edge of said one guide device engageable with the feed table for adjusting the elevation thereof.

12. The construction described in claim 9 and in which the studs of each of said vertical flanges being equally spaced, the supporting bar of one guide device being interchangeable with the supporting bar of the other guide device.

13. The construction described in claim 5 and in which said horizontal flange is provided with an aperture therethrough adjoining said vertical flange through which underlying portions of the feed table may be seen.

14. The construction described in claim 9 and including web feet devices overlying certain of said feed belts, each web foot including a bottom portion having upwardly curved leading and trailing edges relative to the direction of travel of said belts, said bottom portion having an aperture therethrough, a ball extending partially through said aperture, and a bendable spring leaf overlying said ball and engaging the upper surface thereof to apply a predetermined pressure thereupon.



**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,120,983 | Sigafoos | Dec. 15, 1914 |
| 2,387,954 | Thompson | Oct. 30, 1945 |
| 2,669,454 | Babicz | Feb. 16, 1954 |
| 2,699,940 | Huck et al. | Jan. 18, 1955 |
| 2,729,136 | Feick et al. | Jan. 3, 1956 |