United States Patent

Mowry et al.

[15] **3,663,011**

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[54] PRINTING PRESS NONSTOP SIDE REGISTER MECHANISM

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[52] **U.S. Cl.** **271/49,** 271/59

[51] **Int. Cl.** **B65h 9/10**

[58] **Field of Search** 271/48, 49, 59, 55, 50, 60, 271/58, 13, 15

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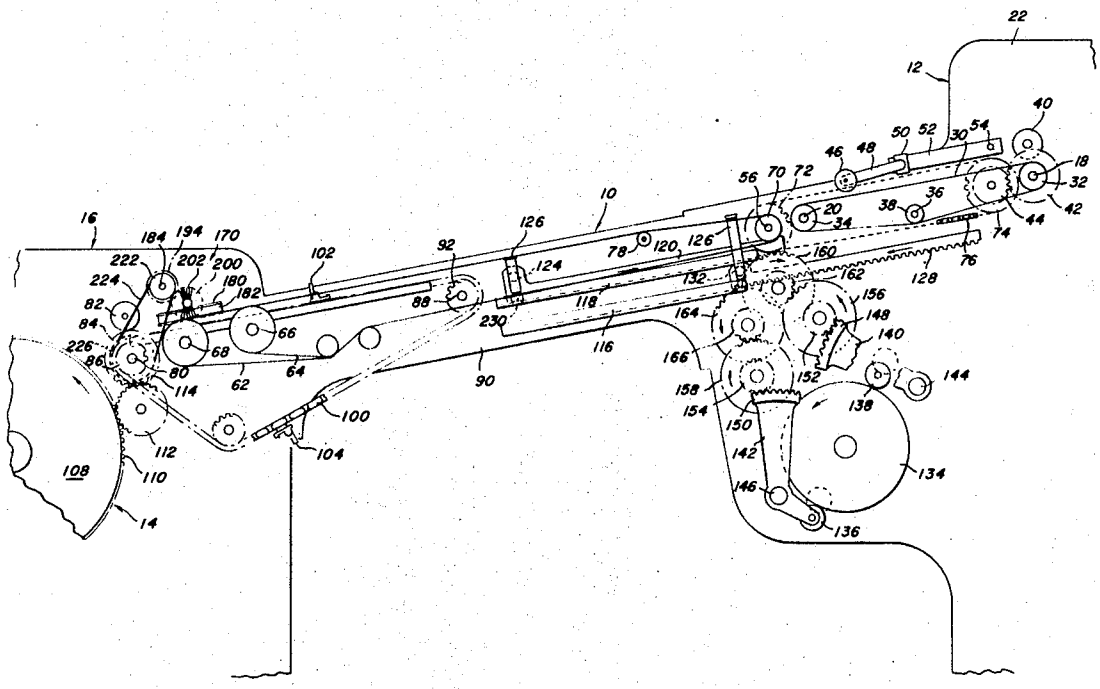
[57] **ABSTRACT**

The side register mechanism is positioned between a sheet feeder mechanism and the feed rolls of the press and includes a plurality of spaced parallel endless tapes reeved around spaced pulleys mounted on a feed board. The tapes are parallel to the longitudinal axis of the press and are driven by certain of the pulleys to convey separate sheets from the feeder to the press. There are a plurality of parallel suction device guide members positioned below the upper run of the tapes and suction heads are arranged to move reciprocally in the guides. The guides are positioned at an acute angle to the tapes and the suction devices in the guides engage the sheet adjacent the leading edge and direct the sheet laterally toward a side of the feed board as the sheet is conveyed toward the press feed rolls by the tapes. The lateral movement of the sheet moves the side edge of the sheet beneath a rotating brush member that urges the sheet side edge against a moving vertical endless side guide tape. The rotating brush member urges the sheet side edge against and maintains the sheet side edge in abutting relation with the side guide tape. The sheet is thus brought into and maintained in side register and conveyed in side register to the feed rolls. Endless driven chains with stop members move at a slightly lower linear velocity than the main conveying tape so that the front edge of the sheet is maintained in abutting relation with the stops. The suction devices are arranged in pairs and are retracted as they move rearwardly toward the feeder.

18 Claims, 10 Drawing Figures



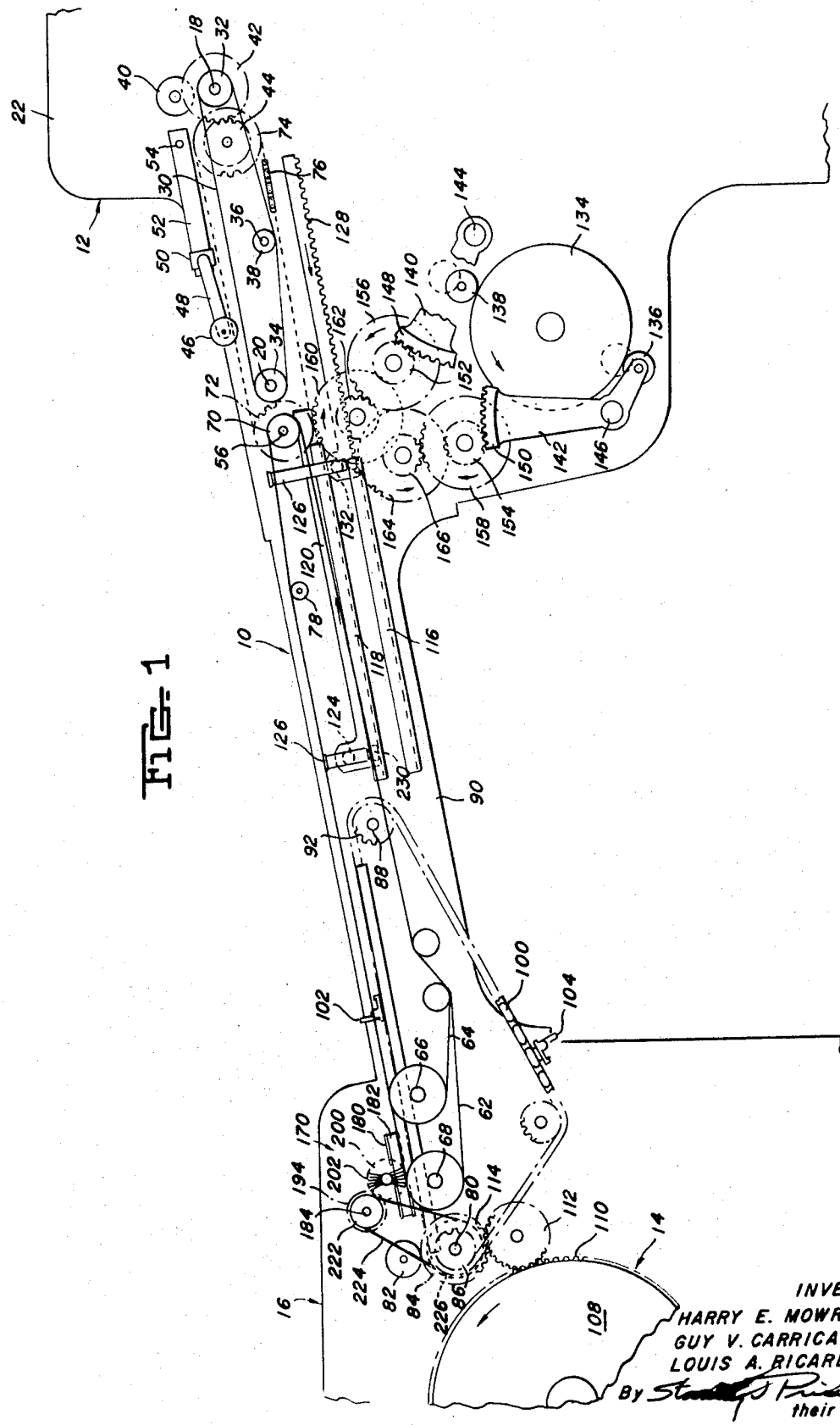


FIG. 1

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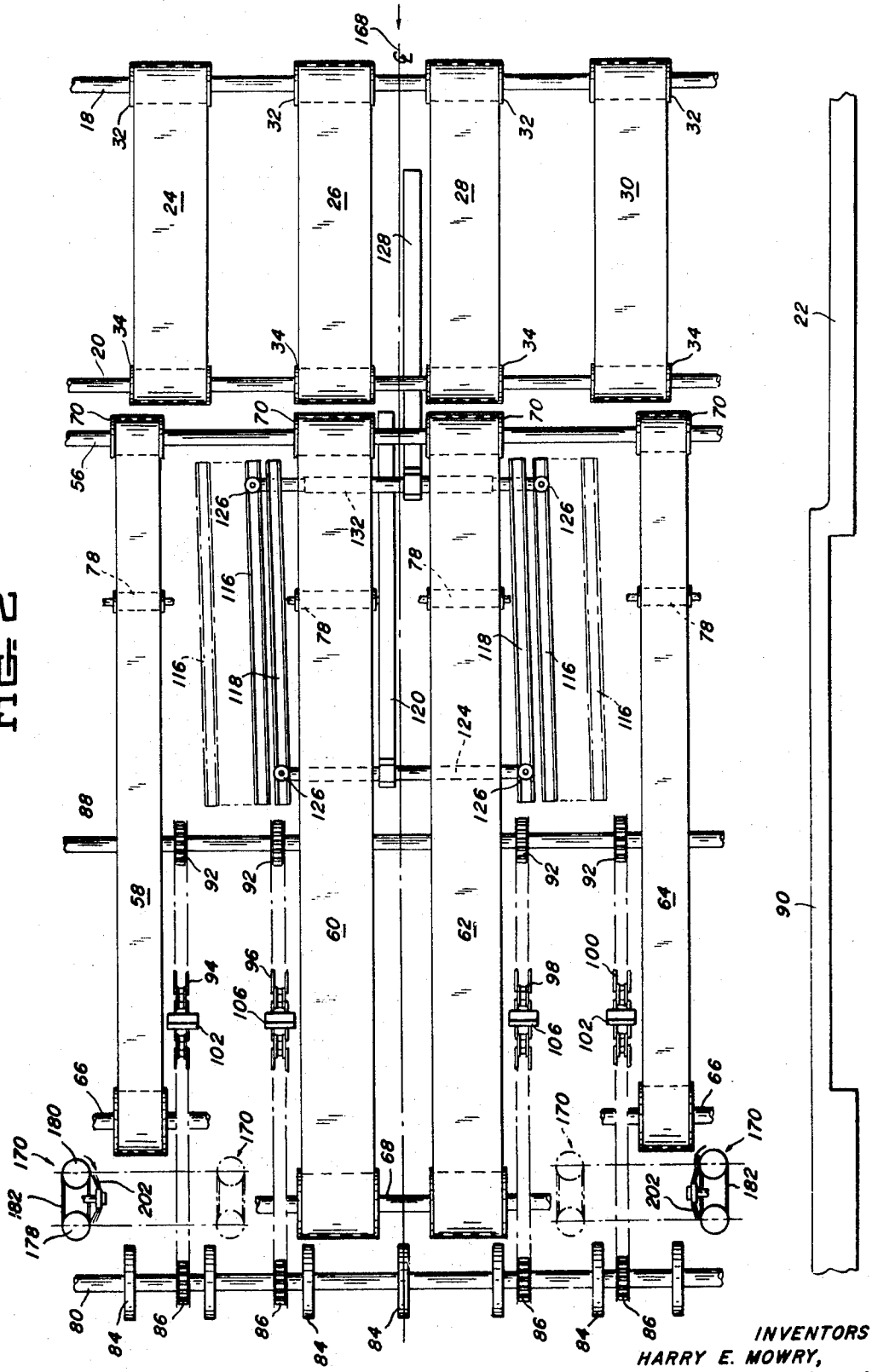
FIG. 2



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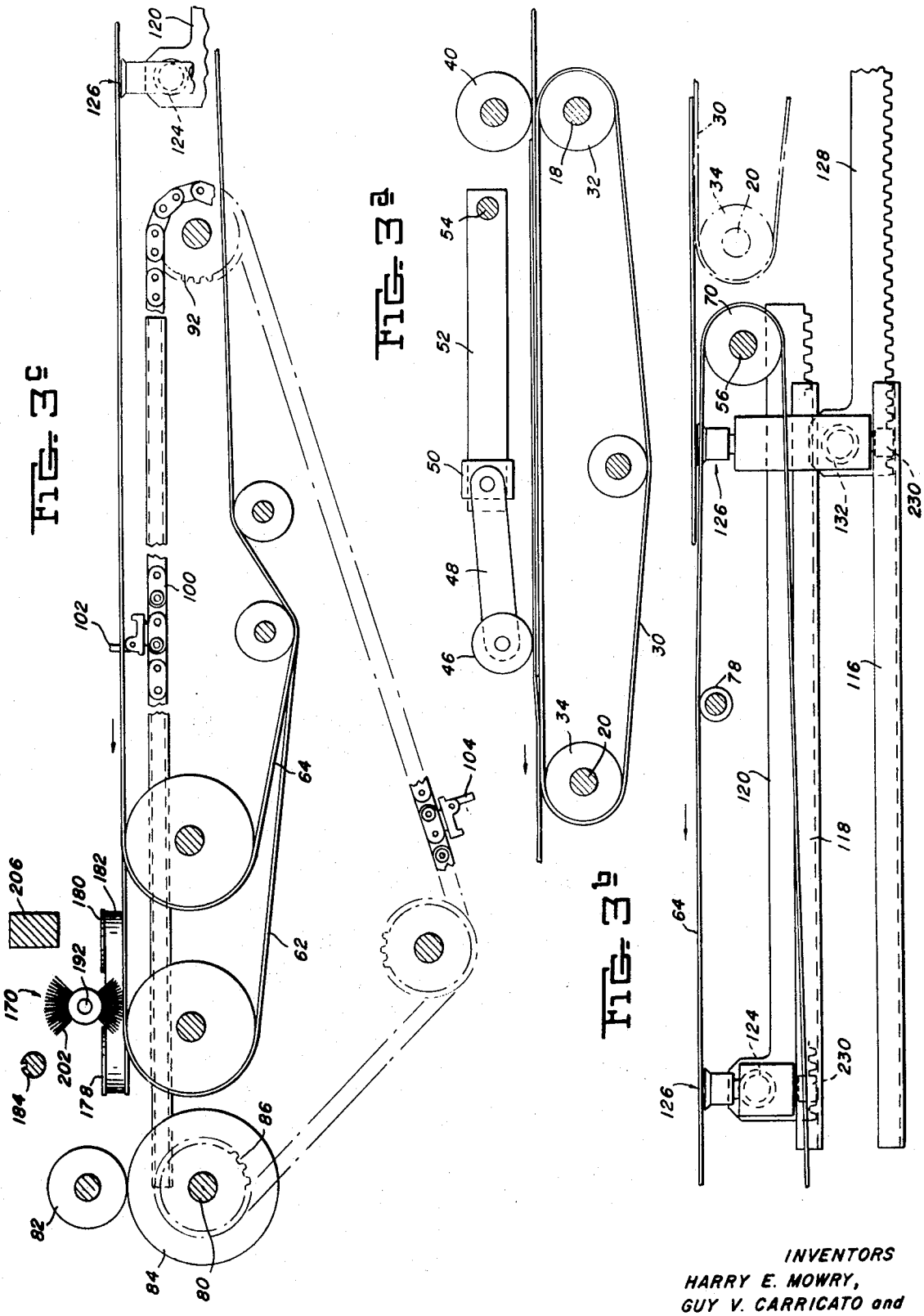

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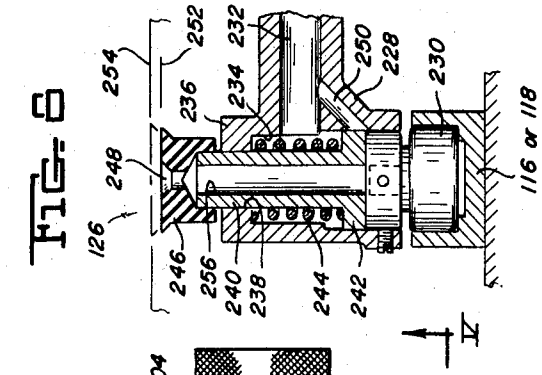

FIG. 8

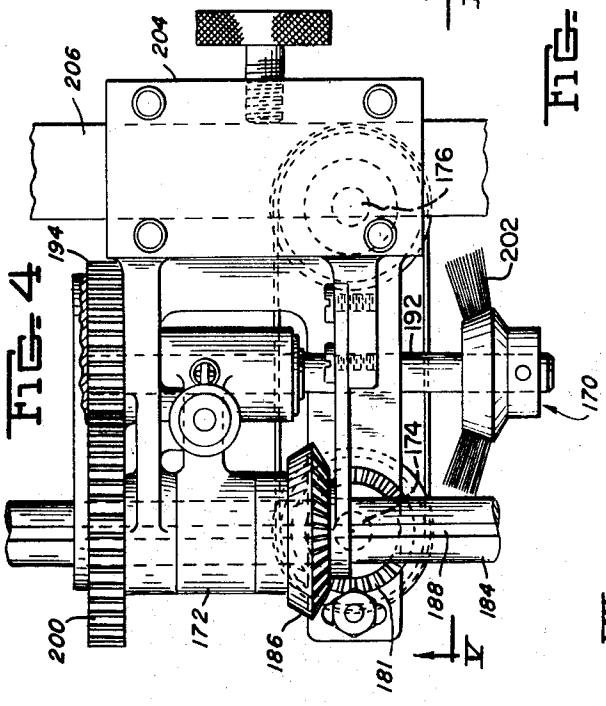

FIG. 4

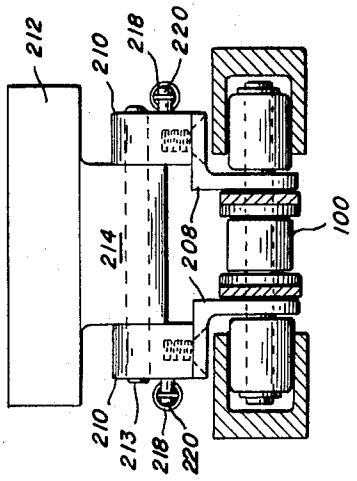

FIG. 7

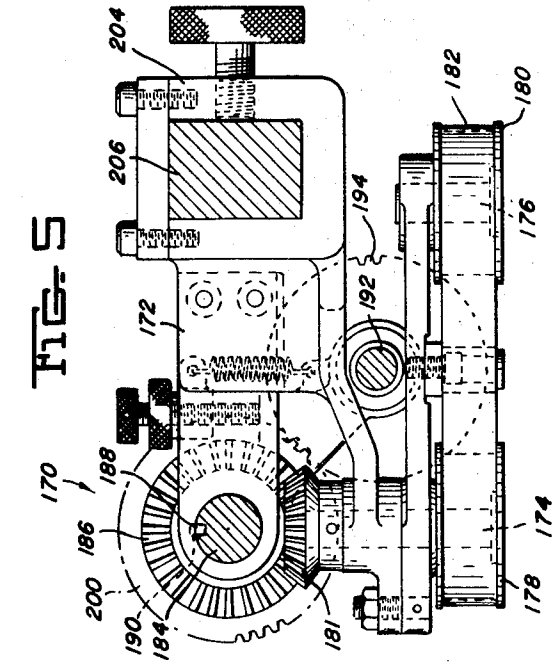

FIG. 5

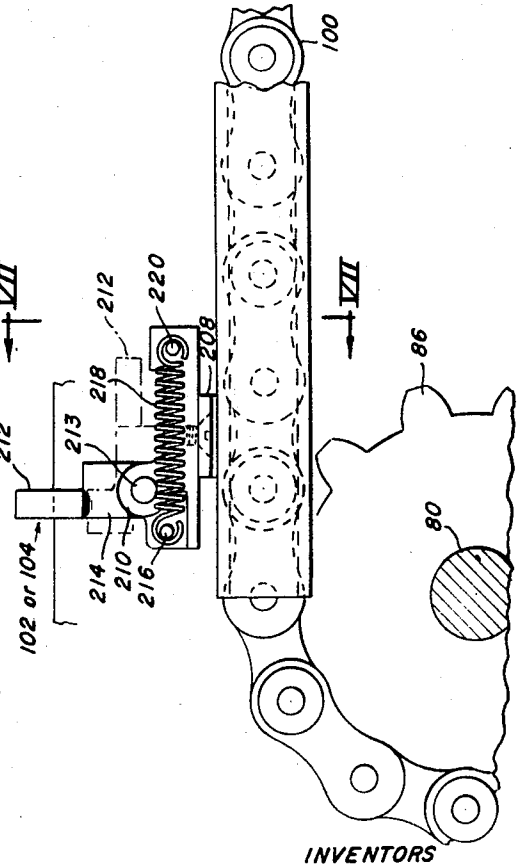

FIG. 6

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PRINTING PRESS NONSTOP SIDE REGISTER MECHANISM

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to apparatus for moving a sheet into side register and more particularly to apparatus for moving a sheet into side register as the sheet is being conveyed to the press.

2. Description of the Prior Art

In substantially all sheet fed printing presses, where the sheets are fed sheet by sheet down a feed board to the press, the sheet is stopped on the feed board and moved laterally by a side guide mechanism into side register. The sheet is thereafter accelerated to a slightly higher velocity than the peripheral velocity of the printing press impression cylinder and the sheet leading edge is moved into abutting relation with the front register bar for front register of the sheet. The leading edge of the sheet is then engaged by the grippers on the impression cylinder and the sheet is thereafter conveyed through the press in both side and front register. A printing press side guide that requires stopping the sheet and moving the sheet laterally into side register is illustrated and described in U. S. Pat. No. 2,553,758.

One of the problems encountered with a sheet side register mechanism that requires stopping the sheet is the high acceleration and deceleration imparted to other portions of the press. A substantial load is imposed on the gearing, shafts and the like to start and stop the apparatus both associated with transporting the sheet and drivingly connected to other apparatus associated with the sheet transporting apparatus. A substantial amount of force is required to overcome the inertia experienced in the high acceleration and deceleration of the apparatus especially to accelerate the gearing, shafts and the like to attain the commercial speeds required for feeding sheets into the press. Also, the stopping of the sheets for side register requires substantially larger cylinders within the press. The diameter of the cylinder for a given press speed is dependent on the speed at which the sheets can be continuously supplied to the front register bar on the impression cylinder. Where it is necessary to stop the sheet for side register, cylinders of larger diameter are required for a given press speed to provide time for the sheet front edge to move into abutting relation with the front register bar on the impression cylinder. The oversized cylinders thus have a substantial portion of the cylinder periphery not used to support the sheet being printed. There is a need for a nonstop side register mechanism that does not require stopping the sheet on the feed board to move the sheet laterally into side register.

SUMMARY OF THE INVENTION

This invention relates to a sheet side register that includes a first conveying means to convey a sheet in a first direction preferably from a sheet feeder to the impression cylinder of the press. A second conveying means is arranged to engage and convey the sheet in a second nonparallel direction to the first direction to move the sheet laterally into abutting relation with a side guide mechanism positioned along the side of the first conveying means. The side guide mechanism engages the side edge of the sheet as it is being conveyed toward the impression cylinder and while the sheet is moving aligns the sheet side to a preselected side register.

The second conveying means includes reciprocating suction devices operable to engage a surface of the sheet and move the sheet in an angular direction to the direction imparted by the first conveying means.

The side guide mechanism includes a vertical, driven endless belt that is aligned to provide preselected side register. A driven device engages the upper surface of the sheet adjacent the vertical endless belt and urges the sheet side edge portion into abutting relation with the driven endless belt to maintain the sheet in side register as it is engaged by the feed rolls and conveyed to the front register bar on the impression cylinder.

Accordingly, the principal object of this invention is to eliminate stopping the sheet for side register of the sheet as it is conveyed to the printing press.

Another object of this invention is to reduce the size of the press cylinder by concurrently moving the sheet into side register as it is being conveyed to the impression cylinder.

Another object of this invention is to eliminate the high acceleration and deceleration of the sheet feeding apparatus by not stopping the sheet for side register.

These and other objects and advantages of this invention will be more completely disclosed and described in the following specification, the accompanying drawings and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic view in side elevation of the nonstop register drive arrangement positioned between a sheet feeder and the printing press.

FIG. **2** is a schematic plan view of the nonstop side register mechanism illustrating the adjustable positions of the suction device guide members and the sheet side register mechanisms.

FIGS. **3***a*, **3***b* and **3***c* are fragmentary enlarged schematic views of the nonstop register mechanism in side elevation. FIG. **3**b illustrates in greater detail the suction device guide member and the manner in which the suction devices are reciprocated thereon.

FIG. **4** is a top plan view of the side guide mechanism and the manner in which it is adjustable transversely on the feed board.

FIG. **5** is a view in section taken along the line **5—5** in FIG. **4** illustrating the vertical side guide tape in detail.

FIG. **6** is a fragmentary view in side elevation illustrating the chain drive mechanism with the retractable stop members.

FIG. **7** is a view in rear elevation taken along the lines **7—7** of FIG. **6**.

FIG. **8** is a view in vertical section of the vacuum device illustrating the manner in which the vacuum head is retracted as the vacuum device is moved rearwardly on the feed board.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings and particularly FIGS. **1–3**, there is illustrated a feed board generally designated by the numeral **10** positioned between a sheet feeder mechanism **12** and the impression cylinder **14** of printing press **16**. The feed board is suitably secured between the feeder **12** and press **16**. A first pair of shafts **18** and **20** are suitably supported in the feeder side frames **22** only one of which is illustrated in FIG. **2**. Four endless tapes **24, 26, 28** and **30** are each reeved about a pair of pulleys **32** and **34** (FIGS. **1** and **3**a) mounted on shafts **18** and **20**. A tape tensioning shaft **36** with pulley **38** thereon is positioned between the upper and lower run of the tapes and is arranged to provide the desired tension on the tapes so that the upper run of tapes **24, 26, 28** and **30** are in parallel spaced relation and arranged to frictionally engage the under surface of the sheet and convey the sheet toward the press **16**. Positioned in overlying relation with the shaft **18** are pull-in wheels **40** associated with the feeder mechanism and arranged to frictionally engage the upper surface of the sheet and pull the sheet onto the upper surface of the tapes **24, 26, 28** and **30**.

Referring to FIG. **1**, shaft **18** has a gear **42** thereon which meshes with gear **44** that is associated with the feeder mechanism **12** and provides the timed drive input for the shaft **18** which, in turn, rotates the pulleys **32** and moves the tapes **24, 26, 28** and **30** at a preselected velocity. The pull-in wheel **40** is also driven at the same velocity as the tapes **24, 26, 28** and **30**. Positioned above the tapes **24, 26, 28** and **30** is an adjustable roller **46** rotatably supported by straps **48** pivotally secured to a sleeve member **50**. The sleeve **50** is movable longitudinally on member **52** fixedly secured at **54** to the feeder **12**. The adjustable roller **46** is operable to exert a force on the

upper surface of the sheet and is adjustable to maintain the force on the upper surface of different sized sheets while they are being conveyed along the feed board **10**.

A shaft **56** is rotatably supported by the feeder frame **22** and has reeved therearound endless tapes **58, 60, 62** and **64**. The outboard tapes **58** and **64** are reeved about idler pulleys on shaft **66** which is illustrated as broken away to more clearly illustrate the register mechanism. The tapes **58** and **64** are shorter than tapes **60** and **62** because of the lateral adjustment of the side guide mechanism, to be later explained. Inboard tapes **60** and **62** are reeved about pulleys on a common shaft **68** positioned in front of the shaft **66**. Each of the tapes **58, 60, 62** and **64** are reeved about a pulley **70** nonrotatably secured to shaft **56**. The shaft **56** has a sprocket **72** (FIG. 1) secured thereto and the gear **44** associated with the feeder mechanism **12** has a sprocket **74** rotatable therewith and an endless chain **76** provides drive between the gear **44** through sprockets **74** and **72** to the shaft **56** and tapes **58, 60, 62** and **64**. Idler pulley **78** is positioned beneath the upper run of each of the tapes **58, 60, 62** and **64** and is arranged to maintain the upper run of tapes **58, 60, 62** and **64** in a substantially horizontal plane and in the same plane with tapes **24, 26, 28** and **30** so that the sheet being conveyed from tapes **24, 26, 28** and **30** to tapes **58, 60, 62** and **64** is maintained in substantially the same horizontal plane. The pitch diameter of sprockets **72** and **74** rotates the shaft **56** and moves the tapes **58, 60, 62** and **64** at a higher velocity than the tapes **24, 26, 28** and **30**. For example, the tapes **58, 60, 62** and **64** may be arranged to have three times the velocity of tapes **24, 26, 28** and **30**.

A shaft **80** associated with the feed rolls **82** and **84** has a plurality of sprockets **86** nonrotatably secured thereto. Another shaft **88** is rotatably supported in the feed board side frame **90** with a plurality of sprockets **92** rotatably secured thereto. Endless chains **94, 96, 98** and **100** are each reeved about sprockets **86** and **92** for rotation therearound. Each of the outboard chains **94** and **100** has pairs of retractable stop members **102** and **104** thereon and the inboard chains **96** and **98** each has pairs of nonretractable stops designated by the numeral **106**, only two of which are illustrated in FIG. **2**. It should be understood, however, that stops **102** and **106** are arranged on the respective chains **94, 96, 98** and **100** to move in parallel relationship with each other as the respective chains orbit about the sprockets **86** and **92**. The stops **102** and **104** are retractable to permit the width adjustment of the sheet guide mechanism, as later explained.

Within the press **16** there is schematically illustrated in FIG. **1** an impression cylinder **108** with a drive gear **110** that meshes with an idler gear **112** suitably supported within the press **16**. The idler gear **112** meshes with gear **114** nonrotatably secured to shaft **80** on which the sprockets **86** are secured. With this arrangement the endless chains **94–96** and **98–100** are driven in timed relation with the impression cylinder **14** through gearing **110, 112, 114** and the sprockets associated with the shaft **80**. The ratio of the gears driving the sprockets on shaft **80** is such that the chain velocity is slightly less than the velocity of the tapes **58, 60, 62** and **64**. With this arrangement the front edge of the sheet as it is being conveyed by the tapes **58, 60, 62** and **64** is moved into and maintained in abutting relation with the stop members **102–106** or **104–106**.

Positioned beneath the upper run of tapes **58, 60, 62** and **64** are a pair of outboard suction device guides **116** and a pair of inboard suction device guides **118**. The outboard guides are adjustable laterally to the position illustrated in phantom lines in FIG. **2** for sheets of different widths. The inboard guides **118** are positioned at an elevation above the outboard guides **116** to permit the reciprocation of the vacuum devices hereinafter described. An upper vacuum device drive rack **120** has a bar **124** extending laterally therefrom. Secured to the end of the bar **124** is a suction device generally designated by the numeral **126** that is positioned in the guides **118** for reciprocal movement therein. Similarly, the lower rack member **128** has an extensible rod **132** extending laterally therefrom with suction device **126** secured to the end thereof and positioned in the guides **116**. The guides **116** and **118** and the racks **120** and **128** are suitably supported by the feed board frame **90** with the guides **116** and rods **124** and **132** being extensible and retractable to compensate for sheets of different width.

The drive mechanism for the racks **120** and **128** is illustrated in FIG. **1**. A cam mechanism diagrammatically illustrated at **134** is arranged to move the cam followers **136** and **138** on the arms **140** and **142** to the positions illustrated in solid and dotted lines in FIG. **1**. The arms **140** and **142** are pivotally secured to the feeder frame on shafts **144** and **146**. Arcuate gear segments **148** and **150** are secured to the ends of the respective arms **140** and **142** and are arranged to rotate pinions **152** and **154**. A gear **160** meshes with the upper vacuum rack **120** and has a pinion **162** associated therewith. The pinion **162** meshes with the gear **156** so that oscillation of the arcuate gear **148** on shaft **140** by rotation of cam **134** reciprocates the rack **120** to move the suction devices **126** within the respective guide members **118**. Similarly, the lower rack **128** meshes with a gear **164** that has a pinion **166** associated therewith. The pinion **166** meshes with the large gear **158** and oscillation of the arcuate gear **150** by cam followers **136** reciprocates the lower rack mechanism **128**.

With this arrangement the suction devices **126** associated with upper rack mechanism **120** engage and advance a sheet while the suction devices **126** associated with lower rack mechanism **128** retract to the rearward position so that the suction devices associated with rack **128** are in position to engage the second sheet. It should be noted, as clearly illustrated in FIG. **2**, that the suction device guides **116** and **118** are arranged at an obtuse angle to the press center line **168** and also at an obtuse angle to the tapes **24, 26, 28** and **30** and **58, 60, 62** and **64**. The guides **116** and **118** are arranged to direct the suction devices angularly toward the operator's side, as illustrated in FIG. **2** and designated by the feed board side frame **90**. It should be understood where desired the longitudinal axis of the vacuum device guide members **116** and **118** can be adjusted so that the guides **116** and **118** are at an obtuse angle facing the other direction than illustrated in FIG. **2**. This arrangement permits side registering the sheets on either side of the feed board.

A pair of side edge register mechanisms **170** are generally illustrated in FIGS. **1, 2** and **3***c* and are illustrated in detail in FIGS. **4** and **5**. It should be understood that the side guide mechanisms **170** on opposite sides of the feed board **10** are similar in construction and similar numerals are intended to designate similar parts. Referring to FIGS. **4** and **5** the side guide mechanism includes a housing **172** that has a pair of shafts **174** and **176** extending forwardly therefrom. Pulleys **178** and **180** are supported on shafts **174** and **176**. The pulley **178** is nonrotatably secured to shaft **174** which, in turn has a bevel gear **181** secured to the other end thereof. An endless side guide tape **182** is reeved about the pulleys **178** and **180** and is arranged to be driven from shaft **184** through bevel gears **186** and **181**. The shaft **184** has a longitudinal spline **188** in which a key **190** of gear **186** is positioned. Thus rotation of shaft **184** rotates gear **186** irrespective of the relative position of gear **186** on shaft **184**. The housing **172** rotatably supports a shaft **192** above the side guide tape **182**. The shaft is drivingly connected to shaft **184** through gears **194** and **200** so that rotation of shaft **184** rotates shaft **192**. A brush **202** having a generally conical configuration as viewed in top plan is arranged to rotate with shaft **184** and exert a force against the sheet and urge the sheet against the timing belt **182**. The housing **172** has a rectangular support bracket **204** which is positioned on a support shaft **206** and movable longitudinally thereon. Referring to FIG. **2**, the side guide mechanisms are movable on the support shaft from the position illustrated in full lines to the position illustrated in dotted lines. With this arrangement, one of the side guide mechanisms can be moved into desired side register position and the other side guide mechanism moved out of operative position. The side guide mechanisms can be moved along an axis transverse to the

press center line **168** to provide sheet side register for sheets of different width.

As will be apparent from FIG. **2**, the stop mechanisms **102** and **104** on the outboard chains **94** and **100** would interfere with the side guide mechanisms **170** when they are in overlying or inboard position relative to the chains **94** and **100**. As illustrated in FIGS. **6** and **7**, the stop members, for example stop members **102**, **104** illustrated in FIGS. **6** and **7**, are collapsible to provide clearance for the side guide mechanism **170**. When the side guide mechanism **170** is in the inboard position illustrated in dotted lines in FIGS. **2**, the stop members **102** and **104** are manually moved to their down position and the front edge of the sheet only abuts stops **106** on chains **96** and **98**. Thus, when the side guide mechanism is moved inboard of chains **94** and **100** the stop members **102** and **104** are collapsed and removed from service.

The side guide tape **182** and brush **202** are driven by the shaft **184** (FIG. **1**) that has a pulley **222** nonrotatably secured thereto. A timing belt **224** is reeved about the pulley **222** and a pulley **226** on shaft **80**. The shaft **80** is, in turn, driven through gears **112** and **114** from gear **110** on impression cylinder **108**. With this arrangement the side guide tape and brush are driven in timed relation to the chains **94**, **96**, **98** and **100** and tapes **58**, **60**, **62** and **64**.

The stop mechanism **102** has a body portion **208** secured to the chain **100** and an upstanding bracket portion **210**. A stop bar **212** has a depending hinge portion **214** which is pivotally secured to the bracket portion **210** on pin **213** and has laterally extending pins **216**. Spring **218** is secured at one end to a pin **220** on the body portion **208** and at the other end on the pin **216** on the stop bar **212**. The pivot point has an off-center pivot arrangement so that the stop bar will remain in an up position against the resilient force of the spring and in a down position when moved over center. The stop bar **212** is manually moved from the up to the down position and also manually moved from the down to the up position depending on the relative position of the side guide mechanism **170**.

The suction devices **126** have a body portion **228** with a cam follower **230** positioned in the guides as, for example, guide **116**. The body portion has a horizontal passageway **232** that communicates with a vertical passageway **234**. The body portion **228** has an upper wall **236** with an opening **238** therethrough. A tubular shaft **240** having an enlarged end portion **242** is positioned in the vertical passageway **234** with the portion **240** extending through aperture **238**. A spring **244** abuts the enlarged portion **242** and urges the tubular member **240** downwardly. A rubber head **246** is secured to the tubular member **240** outside of the housing **228** and has an aperture **248** therethrough. The horizontal passageway **232** communicates with the vertical passageway **234** and with an angular passageway **250**. With this arrangement the suction head is normally in the retracted position designated by the numeral **252** which is below the feed board line **254**. When a vacuum is applied to passageway **232** the vertical chamber **234** is evacuated and the tubular member **240** with the rubber head **246** moves upwardly to the position wherein the top of the rubber head **246** is in the same plane as the top of the feed board **10**. Upward movement of the tubular member **240** opens chamber **250** and evacuates the chamber beneath the enlarged portion of the tubular member **240** and exerts a vacuum or suction through the axial opening **256** in the tubular member **240** so that the under surface of the sheet is engaged to the upper surface of the rubber suction head by the suction. When the vacuum is turned off, the sheet is released and the spring returns the tubular member **240** to the position illustrated in FIG. **8**.

OPERATION

Referring particularly to FIGS. **1–3**, the nonstop sheet side register mechanism operates as follows. A feeder **12** feeds single sheets through the pull-in rolls **40** onto the tapes **24**, **26**, **28** and **30**. The adjustable roller **46** maintains the sheets in engagement with the tapes **24**, **26**, **28** and **30** until the leading edge of the sheet is engaged by a pair of the suction devices **126**. The sheets on the tapes **24**, **26**, **28** and **30** have the front edge generally perpendicular to the center line **168** of the press and the sheet is conveyed in this manner from tapes **24**, **26**, **28** and **30** to tapes **58**, **60**, **62** and **64**. As previously discussed, the tapes **58**, **60**, **62** and **64** are moving at approximately three times the velocity of the tapes **24**, **26**, **28** and **30** and are arranged to convey the sheets in a direction parallel to the press center line **168**. The suction devices **126** associated with racks **120** and **128** are arranged in timed relation with the other components of the feeder to position a pair of suction devices beneath the sheet adjacent the leading edge as the sheet is conveyed from the tapes **24**, **26**, **28** and **30** to tapes **58**, **60**, **62** and **64**. The under side of the sheet is engaged by the suction devices **126** while the sheet is being conveyed by the tapes **24**, **26**, **28** and **30**. The drive mechanism for the vacuum racks **120** and **128** is so arranged to increase the velocity of the suction heads **126** so that the suction heads are moving at substantially the same speed as the tapes **24**, **26**, **28** and **30** when the leading edge of the sheet is engaged by the suction heads **126**. The velocity of the suction heads is increased to substantially the same velocity as the tapes **58**, **60**, **62** and **64** while the suction devices **126** advance along the tracks or guides **116** and **118**. When the suction devices attain the velocity of the tapes **58**, **60**, **62** and **64**, the sheet is released by the suction heads. During the acceleration of the sheet the sheet is deflected or moved sidewardly toward, for example in FIG. **2**, the operator's side, designated by the numeral **90**, by the suction heads **126**. The sheet on tapes **58**, **60**, **62** and **64** is then moving at the velocity of the tapes **58**, **60**, **62** and **64** and is arranged to abut the stops **102** or **104** and **106** on the endless chains **94**, **96**, **98** and **100**. The velocity of the stops and chains is slightly lower than the velocity of the tapes **58**, **60**, **62** and **64** so that the front edge of the sheet is brought into and maintained in abutting relation with the sheet stops on the chains **94**, **96**, **98** and **100**.

As the sheet to be conveyed moves toward the press feed rolls **82** and **84** the side edge of the sheet is moved beneath the brush **202**. The bristles of brush **202** urge the sheet side edge against the side guide tape **102** which is moving at substantially the same velocity as the chains **94**, **96**, **98** and **100**. With this arrangement both the brushes **202** and side guide tape **182** and chains **94**, **96**, **98** and **100** are moving at the same velocity so that the sheet edge portion is moved into abutting relation with the vertical side guide and is conveyed thereby into the feed rolls **82** and **84**. The side guide tape **182** is positioned along a desired line of side register for the press and the sheet side edge is in abutting relation with the vertical side guide tape and in side register. The sheet in side register is conveyed between the feed rolls **82** and **84** at a velocity slightly higher than the velocity of the impression cylinder **108** so that the sheet front edge portion abuts the register bar on the impression cylinder to provide front register for the sheet as it is engaged by the grippers on the impression cylinder.

With this arrangement the sheet is continually conveyed from the feeder mechanism **12** to the impression cylinder **14** and moved into side register without stopping the sheet as has been the practice in the past. With the two pairs of vacuum devices **126** and the pairs of stop members **102**, **104** and **106** on the chains **94**, **96**, **98** and **100** it is possible to rapidly feed sheets to the press inside register without waiting for repositioning of the side guide mechanism to accept and side register the following sheet.

According to the provisions of the patent statutes, we have explained the principle, preferred construction and mode of operation of our invention and have illustrated and described what we now consider to represent its best embodiments.

We claim:

1. A sheet side register mechanism comprising,

first conveying means to convey a sheet in a first direction,

second conveying means including suction devices operable to engage a surface of said sheet and move said sheet in a

second direction while said sheet is being conveyed by said first conveying means, said second direction being at an acute angle to said first direction,

side guide means positioned adjacent said first conveying means to engage the side edge of said sheet and align said sheet with a preselected side register, and

said second conveying means operable to move said sheet toward said side guide means.

2. A sheet side register mechanism as set forth in claim 1 which includes,

a third conveying means arranged parallel to said first conveying means,

stop means extending from said third conveying means to engage the front edge of said sheet,

said third conveying means arranged to move at a velocity slower than the velocity of said first conveying means so that said sheet front edge portion remains in abutting relation with said stop means as said sheet is conveyed in said first direction.

3. A sheet side register mechanism as set forth in claim 2 in which,

said suction devices are operable to be disengaged from said sheet prior to said sheet front edge abutting said stop means on said third conveying means.

4. A sheet side register mechanism as set forth in claim 2 in which,

said first conveying means includes a plurality of parallel tapes operable to frictionally engage a surface of said sheet and convey said sheet at a preselected velocity,

said side guide means including an endless side guide band positioned along the side of the outermost tape,

means to drive said side guide band at a speed to propel said sheet side edge at substantially the same velocity as said third conveying means.

5. A sheet side register mechanism as set forth in claim 1 in which,

said first conveying means includes a plurality of endless tapes arranged in parallel relation to each other and reeved about spaced pulleys,

said tapes arranged to frictionally engage a surface of said sheet and convey said sheet in said first direction at a preselected velocity.

6. A sheet side register mechanism as set forth in claim 1 in which,

said suction devices operable to engage the same surface of said sheet as said parallel endless tapes.

7. A sheet side register mechanism as set forth in claim 1 in which,

said suction devices engage a surface of said sheet and accelerate said sheet to about the velocity of said first conveying means.

8. A sheet side register mechanism as set forth in claim 1 in which,

said first conveying means includes a plurality of parallel tapes arranged to frictionally engage a first surface of said sheet and convey said sheet, and

said side guide means including other conveying means to engage the opposite surface of said sheet and urge said sheet into side register position.

9. A sheet side register mechanism as set forth in claim 8 in which,

said other conveying means includes a brush member rotatably positioned above said sheet for engaging said sheet and urging said sheet into side register position.

10. A sheet side register mechanism as set forth in claim 1 in which,

said second conveying means includes a plurality of guides positioned in parallel relation to each other and angularly to said first conveying means, and

said suction devices positioned in said guides and operable to reciprocate therein to engage and convey said sheets in said second direction.

11. A sheet side register mechanism as set forth in claim 10 in which said suction devices include suction members movable toward and away from the surface of said sheet, and

means to retract said members while said suction devices are moving in a direction opposite to said second direction.

12. A sheet side register mechanism as set forth in claim 10 in which,

said suction devices include a first pair of suction members and a second pair of suction devices,

said first pair of suction devices connected to a first rack member,

said second pair of suction devices connected to a second rack member,

drive means to reciprocate said first and second rack members so that one of said pair is moving in said second direction while said other pair is moving in a direction opposite to said second direction.

13. A sheet side register mechanism as set forth in claim 1 which includes,

means to move said second conveying means and said side guide means laterally relative to said first conveying means to thereby provide side register for sheets of different widths.

14. A sheet side register mechanism as set forth in claim 1 which includes,

third conveying means associated with a sheet feeder positioned adjacent the feed end of said side register mechanism,

said third conveying means operable to convey said sheets at a second velocity substantially less than the velocity of said first conveying means, and

said second conveying means operable to engage and accelerate said sheet from said second velocity to substantially the velocity of said first conveying means.

15. A method for feeding sheets in side register to a press comprising,

supporting a sheet on a first conveying means arranged to convey said sheet in a first direction at a preselected velocity,

engaging the under surface of said sheet by suction devices of a second conveying means and accelerating said sheet to said preselected velocity,

moving said sheet in a second direction toward a side guide mechanism by said suction devices while accelerating said sheet to said preselected velocity,

moving said sheet side edge into abutting relation with said side guide mechanism while said sheet is being conveyed in said first direction to thereby side register said sheet,

moving said sheet front end portion into abutting relation with abutment members moving in said first direction at a velocity less than said preselected velocity, and

feeding said sheet onto a cylinder of a press while maintaining side register.

16. A method for feeding sheets in side register to a press as set forth in claim 15 which includes,

supporting said sheet on a third conveying means and conveying said sheet toward said first conveying means at a velocity substantially lower than said preselected velocity, and

thereafter transferring said sheet from said third conveying means to said first conveying means.

17. A method for feeding sheets in side register to a press as set forth in claim 15 which includes moving the upper surface of said sheet with a fourth conveying means adjacent said sheet side edge and urging said sheet side edge into abutting relation with said side guide mechanism.

18. A method for feeding sheets in side register to a press as set forth in claim 15 which includes,

moving said side guide mechanism in said first direction at substantially said preselected velocity.

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