

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 September 2007 (27.09.2007)

PCT

(10) International Publication Number
WO 2007/109644 A2

(51) International Patent Classification:
B65G 63/02 (2006.01)

(21) International Application Number:
PCT/US2007/064357

(22) International Filing Date: 20 March 2007 (20.03.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/783,915 20 March 2006 (20.03.2006) US

(71) Applicant (for all designated States except US): **THIELE TECHNOLOGIES, INC.** [US/US]; 315 27th Avenue NE, Minneapolis, Minnesota 55418 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **POPEJOY, William L.** [US/US]; 13057 Union Terrace Lane, Champlin, Minnesota 55316 (US). **BERGMAN, Perry D.** [US/US]; 7924 5th Street NE, Spring Lake Park, Minnesota 55432 (US).

(74) Agents: **LEWEN, Elizabeth D.** et al.; Sherrill Law Offices, PLLC, 4756 Banning Avenue, Suite 212, White Bear Lake, Minnesota 55110 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

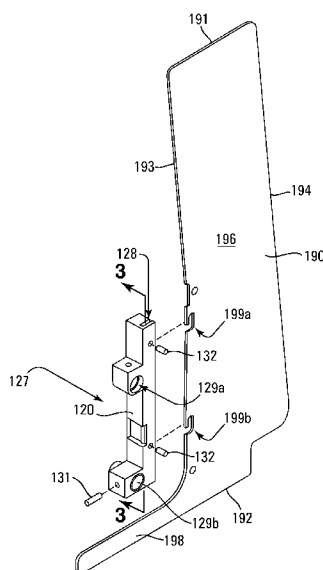
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SIDE GUIDE ASSEMBLY WITH VERTICALLY REPOSITIONABLE SIDE GUIDES FOR USE WITH FRICTION SHEET FEEDING MACHINES



(57) Abstract: A repositionable side guide assembly with vertically repositionable side guides for use with a friction sheet feeding machine.

WO 2007/109644 A2

**SIDE GUIDE ASSEMBLY WITH
VERTICALLY REPOSITIONABLE SIDE GUIDES
FOR USE WITH FRICTION SHEET FEEDING MACHINES**

[0001] This application claims the benefit of United States Provisional Application No. 60/783,915, filed March 20, 2006.

BACKGROUND OF THE INVENTION

[0002] A wide variety of friction sheet feeding machines are available for feeding individual sheets from the bottom of an essentially vertical stack of sheets. Exemplary friction sheet feeding machines are shown and described in United States Patents Nos. 4,991,831, 5,143,365, 5,244,198, 5,642,877, 5,772,199 and 6,932,338.

[0003] These machines typically include (i) a tray for holding a stack of sheets in an essentially vertical position, (ii) a nip for feeding a lowermost sheet from the stack, (iii) a driven friction roller or feed belt for contacting the downward facing major surface of the lowermost sheet in the stack and pulling the lowermost sheet from underneath the sheet stack towards the nip, and (iv) a friction retard surface positioned above the driven friction roller for contacting the leading edge(s) and any exposed upward facing major surface(s) of the sheet(s) positioned directly above the lowermost sheet for retarding advancement of the sheet(s) directly above the lowermost sheet and thereby facilitating separation of the lowermost sheet from the immediately overlying sheet prior to introduction of the lowermost sheet into the feed nip.

[0004] Side guides are commonly employed on friction sheet feeding machines for providing lateral support to a sheet stack loaded onto the tray, and providing lateral guidance to sheets as they are pulled from the stack by the driven friction roller or feed belt(s) and introduced into the nip area. These side guides are commonly mounted on a laterally repositionable carriage to permit quick and easy repositioning of the side guides in order to accommodate sheets of different widths. However, because the side guides typically extend below the upper conveying surface of the feed belts in order to prevent sheets from slipping under the side guide, the feed belts often interfere with lateral repositioning of the side

guides. Hence, the side guides need to be detached from the carriage prior to repositioning of the subassembly and reattached after the carriage has been repositioned.

[0005] While generally effective for facilitating lateral repositioning of the side guides, the repositioning process tends to be an awkward, cumbersome, time consuming and potentially dangerous as it involves detachment and reattachment of the side guides.

[0006] Accordingly, a need exists for laterally repositionable side guides capable of being quickly, easily and safely repositioned without requiring the use of a tool or requiring detachment of the side guides.

SUMMARY OF THE INVENTION

[0007] A first aspect of the invention is a repositionable side guide assembly for use with a friction sheet feeding machine. The side guide assembly includes (i) a support member, (ii) a carriage, and (iii) a side guide. The support member is configured and arranged for attachment to a friction sheet feeding machine. The carriage is repositionably mounted on the support member for selective lateral repositioning relative to the support member. The side guide is configured and arranged for laterally guiding sheets through a friction sheet feeding machine. The side guide is repositionably attached to the carriage for transverse repositioning relative to the carriage as between a lower position and an upper position without detachment of the side guide from the carriage.

[0008] The side guide assembly preferably includes a pair of laterally spaced and laterally repositionable carriages, each with an associated transversely repositionable side guide.

[0009] A second aspect of the invention is a method of laterally repositioning a side guide on a friction sheet feeding machine. The method includes the steps of (i) obtaining a friction sheet feeding machine equipped with a repositionable side guide assembly wherein the side guide assembly includes at least (A) a support member attached to the friction sheet feeding machine, (B) a carriage repositionably mounted on the support member for selective lateral repositioning relative to the support member, and (C) a side guide configured and arranged for laterally guiding sheets through the friction sheet feeding machine, and repositionably

attached to the carriage for transverse repositioning relative to the carriage as between a lower position and an upper position without detachment of the side guide from the carriage, (ii) transversely repositioning the side guide from the lower position to the upper position without detaching the side guide from the carriage, (iii) laterally repositioning the carriage and side guide relative to the support member with the side guide in the upper position, and then (iv) transversely repositioning the laterally repositioned side guide from the upper position to the lower position.

[0010] When the side guide assembly includes a pair of laterally spaced and laterally repositionable carriages, each with an associated transversely repositionable side guide, the method involves repeating steps (ii), (iii) and (iv) for each carriage and associated side guide.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Figure 1 is an exploded perspective view of one embodiment of the invention.

[0012] Figure 2 is an enlarged perspective view of one of the carriages and associated side guide shown in FIG. 1.

[0013] Figure 3 is a cross-sectional side view of the carriage shown in FIG. 2 taken along line 3-3 with the catch pins inserted into the carriage and the corresponding side guide shown attached to the carriage in the lower position.

[0014] Figure 4 is a perspective view of the invention shown in FIG. 1 attached to a friction sheet feeding machine with the side guide in the lower position.

DETAILED DESCRIPTION OF THE INVENTION

Nomenclature

- 10** Friction Sheet Feeding Machine
- 20** Cross Member

- 30** Drive Assembly
- 31** Friction Feed Roller
- 32** Idler Roller
- 35** Friction Feed Belts
- 100** Side Guide Assembly
- 110** Support Rod
- 120** Carriages (120r and 120s)
- 120r** Right Carriage
- 120s** Left Carriage
- 121** Top of Carriage
- 122** Bottom of Carriage
- 123** Front of Carriage
- 124** Back of Carriage
- 127** Lateral Channel Across Front of Carriage
- 128** Transverse Channel Along Back of Carriage
- 129a** First Lateral Bore Through Carriage
- 129b** Second Lateral Bore Through Carriage
- 131** Follower Pin
- 132** Catch Pins
- 140** Worm Screws (140r and 140s)
- 140r** Right Worm Screw
- 140s** Left Worm Screw
- 141** Proximal End of Worm Screw
- 142** Distal End of Worm Screw
- 145** E-Clip
- 150** Center Support Block
- 153** Machine Screws
- 161** First Mounting Blocks
- 162** Second Mounting Blocks
- 163** Machine Screws
- 164** Machine Screws
- 170** Repositioning Knobs
- 170r** Right Repositioning Knob
- 170s** Left Repositioning Knob

- 180** Locking Knobs (180r and 180s)
- 180r** Right Locking Knob
- 180s** Left Locking Knob
- 190** Side Guides (190r and 190s)
- 190r** Right Side Guide
- 190s** Left Side Guide
- 191** Top of Side Guide
- 192** Bottom of Side Guide
- 193** Front or Forward Edge of Side Guide
- 194** Back or Rearward Edge of Side Guide
- 195** Inward Facing Major Surface of Side Guide
- 196** Outward Facing Major Surface of Side Guide
- 198** Forward Projecting Finger
- 199** Slots (199a and 199b)
- 199a** First L-shaped Slot in Forward Edge of Side Guide
- 199b** Second L-shaped Slot in Forward Edge of Side Guide
- x** Longitudinal Direction
- y** Lateral Direction
- z** Transverse Direction

Construction

[0015] Friction sheet feeding machines **10** generally include a frame (not shown), a tray assembly (not shown), a gating assembly (not shown) and a drive assembly **30**. The machines **10** are capable of serially feeding individual sheets (not shown) in a longitudinal direction **x** from the bottom (not shown) of a generally vertical stack of sheets (not shown) retained within the tray assembly (not shown).

[0016] A typical configuration of the frame (unnumbered) is a generally rectangular frame (not shown) having (i) a generally horizontal base plate (not shown), (ii) a right side panel (not shown) extending upward from the base plate (not shown), (iii) a left side panel (not shown) also extending upward from the base plate (not shown), (iv) a rear end plate (not shown) extending upward from the base plate (not shown) and laterally interconnecting the side panels (not shown), (v) at least one lateral cross member, such as cross member **20**,

transversely spaced above the base plate (not shown) and interconnecting the side panels (not shown) for supporting the gating assembly (not shown), and (vi) a plurality of laterally extending support rods (not shown) extending between and interconnecting the side panels (not shown). Other frame configurations may also be employed, such as a cross-beam construction rather than a plate construction. Exemplary frames suitable for use are shown and described in United States Patents Nos. 4,991,831, 5,143,365, 5,244,198, 5,642,877, 5,772,199 and 6,932,338.

[0017] The tray assembly (not shown) is effective for holding a stack of individual sheets (not shown) in a substantially vertical position with a slight biasing of at least the lower portion (unnumbered) of the stack (not shown) towards the gating assembly (not shown) and the drive assembly **30**.

[0018] One means for achieving the desired biasing of the stack (not shown), is to incline the floor (not shown) of the tray assembly (not shown) towards the gating assembly (not shown) and the drive assembly **30**. Other means are known and may also be employed, such as a transversely extending strip (not shown) positioned within the tray assembly (not shown) for supporting the trailing edges (not shown) of the sheets (not shown) in the stack (not shown) wherein the lower portion (unnumbered) of the support strip (not shown) is curved towards the gating assembly (not shown) and the drive assembly **30**. Suitable tray types, styles and configurations are shown and described in United States Patents Nos. 4,991,831, 5,143,365, 5,244,198, 5,642,877, 5,772,199 and 6,932,338.

[0019] A typical gating assembly (not shown) includes a friction retard roller (not shown) driven by an auxiliary electric motor (not shown) for contacting the upward facing major surface (not shown) of sheets (not shown) as they approach the friction feed belts **35** for assisting in separation of a lowermost sheet (not shown) from the immediately overlying sheet (not shown) and preventing the simultaneous feeding of multiple sheets (not shown). Typical gating assemblies are shown and described in United States Patents Nos. 4,991,831, 5,143,365, 5,244,198, 5,642,877, 5,772,199 and 6,932,338.

[0020] Generally, the drive assembly **30** includes a primary drive motor (not shown) and a friction feed roller **31** driven by the primary drive motor (not shown). The friction feed roller **31** drives friction feed belts **35** which contact the sheets (not shown).

[0021] The drive assembly **30** on friction sheet feeding machines **10** typically includes a conveyor system (not shown) downstream from the friction feed belts **35** for receiving individual sheets (not shown) fed from the sheet stack (not shown) by the friction feed belts **35** and conveying the fed sheets (not shown) to the desired location, typically a conveyor belt (not shown) timed to receive and collate sheets (not shown) fed from several aligned friction sheet feeding machines **10**.

[0022] Referring generally to FIG 4, one embodiment of a suitable drive assembly **30** includes a primary drive motor (not shown), and a plurality of laterally *y* aligned and spaced friction feed belts **35**, each mounted onto a driven friction feed roller **31** and an idler roller **32**. The friction feed roller **31** is rotatably attached to side panels (not shown). Similarly, the idler roller **32** extends parallel with the friction feed roller **31** and is rotatably attached to the side panels (not shown). The friction feed roller **31** is driven by the primary drive motor (not shown) via drive belt (not shown).

[0023] Referring generally to FIGs 1 and 4, the invention is a side guide assembly **100** configured and arranged for operable attachment to a friction sheet feeding machine **10** to provided lateral *y* support to a sheet stack (not shown) loaded onto the machine **10** and lateral guidance to individual sheets (not shown) as they are fed through the machine **10**.

[0024] The side guide assembly **100** includes a support rod **110**, right and left carriages **120r** and **120s** (collectively carriages **120**), and right and left side guides **190r** and **190s** (collectively side guides **190**).

[0025] The support rod **110** is positioned just above the cross member **20** with the lateral ends (unnumbered) of the support rod **110** attached to the lateral *y* ends (unnumbered) of the cross member **20** by first mounting blocks **161** and machine screws **163**.

[0026] The carriages **120** are slidably supported on the support rod **110** via a first lateral *y* bore **129a** through each carriage **120**. The carriages **120** are also slidably supported on the cross member **20** via a lateral *y* channel **127** in the front **123** of each carriage **120**.

[0027] The right and left side guides **190r** and **190s** are mounted onto the right and left carriages **120r** and **120s** respectively. The side guides **190** are configured and arranged to cooperatively support a stack of sheets (not shown) therebetween.

[0028] The carriages **120** each have a second lateral bore **129b** extending through the carriage **120**. A right worm screw **140r** extends through the second lateral bore **129b** in the right carriage **120r** and a left worm screw **140s** extends through the second lateral bore **129b** in the left carriage **120s**. The worm screws **140r** and **140s** (collectively **140**) are spirally threaded for cooperatively engaging a follower pin **131** extending into the second lateral bore **129b** in each carriage **120**, whereby rotation of the worm screw **140** causes the corresponding carriage **120** to travel along the length of the rotated worm screw **140**.

[0029] The distal ends **142** of the worm screws **140** are rotatably supported by a center support block **150** attached to the cross member **20** by machine screws **153**.

[0030] The proximal ends **141** of each worm screw **140r** and **140s** is attached to a repositioning knob **170r** and **170s** respectively (collectively repositioning knobs **170**) for effecting independent manual rotation of the attached worm screw **140**. The repositioning knobs **170** are rotatably supported by second mounting blocks **162** attached to the cross member **20** by machine screws **164**.

[0031] A locking knob **180r** and **180s** (collectively **180**) is provided on each carriage **120r** and **120s** respectively, for selectively engaging and disengaging the support rod **110** to prevent further lateral repositioning of the corresponding carriage **120** when the locking knob **180** is rotated into locking engagement with the support member **110**, and permitting repositioning of the corresponding carriage **120** when the locking knob **180** is rotated away from the support member **110**.

[0032] Bearings (unnumbered) are preferably provided at each end (unnumbered) of the first bores **129a** through each carriage **120** to facilitate lateral y sliding of the carriages **120** along the support rod **110**. Bearings (unnumbered) are also preferably provided at each end (unnumbered) of the second bores **129b** through each carriage **120** to facilitate rotation and lateral y sliding of the worm screws **140** relative to the carriages **120**.

[0033] An e-clip **145** can be provided on each worm screw **140** proximate the distal end **142** of the worm screw **140** for serving as a stop to continued inward travel of the carriages **120** along the length of the corresponding worm screw **140**. Other mechanical stops are well known to those of routine skill in the art and may be substituted for the e-clip stop **145** shown and described.

[0034] Referring to FIG 2, each of the side guides **190** has a top **191**, a bottom **192**, a forward edge **193**, a rearward edge **194**, an inward facing major surface **195**, and an outward facing major surface **196**. The side guides **190** preferably include a forward projecting finger **198** extending from proximate the bottom **192** of the side guide **190** for projecting underneath the cross member **20** and thereby providing lateral **y** guidance to sheets (not shown) as they are fed through the gating assembly (not shown) and drive assembly **30**.

[0035] The side guides **190** are mounted to a corresponding carriage **120** so that they travel laterally **y** with the corresponding carriage **120**, and are capable of being transversely **z** lifted relative to the carriage **120** during repositioning of the side guide **190** without being detached from the carriage **120**.

[0036] One mechanism for achieving the desired attachment is depicted in FIG 3. The forward edge **193** of each side guide **190** is retained within a transversely **z** extending channel **128** in the back **124** of the corresponding carriage **120** which extends from the top **121** of the carriage **120** to the bottom **122** of the carriage **120**. L-shaped slots **199a** and **199b** (collectively slots **199**) are cut in the forward edge **193** of each side guide **190** for cooperatively engaging corresponding catch pins **132** positioned within the transverse **z** channel **128**. The side guides **190** are biased downward onto “locking” engagement with the catch pins **132** by gravity (*i.e.*, the catch pins **132** are normally biased into the upper portion of the L-shaped slots **199** as depicted in FIG 3). The transversely **z** extending leg (unnumbered) of the L-shaped slots **199** is elongated to permit the side guide **190** to be lifted relative to the corresponding carriage **120** so as to slide the side guide **190** along the transverse **z** length of the transverse channel **128** without removing the catch pins **132** from within the slots **199**. Generally, a lift distance of about 0.5 cm to 2 cm is sufficient to lift the bottom **192** of the side guide **190** above the friction feed belts **35** and thereby permit unimpeded lateral **y** repositioning of the side guide **190**.

[0037] Other attachment mechanisms capable of coupling the side guide **190** to a corresponding carriage **120** with the necessary and desired upward sliding or pivoting of the side guide **190** relative to the corresponding carriage **120** without detaching the side guide **190** from the carriage **120**, are known and within the scope of this invention. One such example is to replace the catch pins **132** on the carriage **120** with an L-shaped slot **199** and replace the slots **199** on the side guide **190** with trunnions (not shown).

[0038] Biasing means other than gravity are known and may be employed to bias the side guides **190** into the lower “locked” position on the corresponding carriage **120**. Such biasing means include springs, elastic bands, pneumatic cylinders, etc.

Use

[0039] The side guide assembly **100** of the present invention permits quick and easy reposition of the side guides **190** as necessary for accommodating sheets (not shown) of different width by (i) rotating the locking knob **180** to allow the carriage **120** to slide along the support rod **110**, (ii) pulling up on the side guide **190** to position the side guide **190** into the upper position and thereby lift the bottom **192** of the side guide **190** above the friction feed belts **35**, (iii) rotating the repositioning knob **170** as necessary and appropriate to move the carriage **120** and attached side guide **190** into supporting engagement with sheets (not shown) loaded onto the friction sheet feeding machine **10** with the side guide held in the lifted position, (iv) releasing the side guide **190** so as to allow the plate **190** to return to its lower biased position, (v) rotating the locking knob **180** to again lock the carriage **120** against the support rod **110** and prevent any further lateral y movement of the carriage **120** and the corresponding side guide **190** relative to the friction sheet feeding machine **10**, and (vi) repeating steps (i) through (v) for the other side guide **190**.

We claim:

1. A repositionable side guide assembly for use with a friction sheet feeding machine capable of feeding individual sheets from a stack of sheets in a longitudinal direction, comprising:
 - (a) a support member configured and arranged for attachment to a friction sheet feeding machine,
 - (b) a carriage repositionably mounted on the support member for selective lateral repositioning relative to the support member, and
 - (c) a side guide (i) repositionably attached to the carriage for transverse repositioning relative to the carriage as between a lower position and an upper position without detachment of the side guide from the carriage, and (ii) configured and arranged for laterally guiding sheets through a friction sheet feeding machine when the support member is attached to a friction sheet feeding machine.
2. The side guide assembly of claim 1 wherein the side guide is biased into the lower position.
3. The side guide assembly of claim 2 wherein the side guide is biased into the lower position by gravity when the support member is attached to an upright friction sheet feeding machine.
4. The side guide assembly of claim 1 wherein the transverse distance traveled by the side guide between the lower position and the upper position is about 0.5 to about 2 cm.
5. The side guide assembly of claim 1 wherein the side guide is transversely repositionably attached to the carriage by a catch pin cooperatively engaged within a transversely elongated slot.

6. A repositionable side guide assembly for use with a friction sheet feeding machine capable of feeding individual sheets from a stack of sheets in a longitudinal direction, comprising:
- (a) a support member configured and arranged for attachment to a friction sheet feeding machine,
 - (b) a pair of laterally spaced carriages, each repositionably mounted on the support member for selective lateral repositioning along the support member, and
 - (c) a pair of side guides, (i) each repositionably attached to one of the carriages for transverse repositioning relative to the carriage as between a lower position and an upper position without detachment of the side guide from the carriage, and (ii) each configured and arranged for laterally guiding sheets through a friction sheet feeding machine when the support member is attached to a friction sheet feeding machine.
7. The side guide assembly of claim 6 wherein the side guides are biased into the lower position.
8. The side guide assembly of claim 7 wherein the side guides are biased into the lower position by gravity when the support member is attached to an upright friction sheet feeding machine.
9. The side guide assembly of claim 6 wherein the transverse distance traveled by each of the side guides between the lower position and the upper position is about 0.5 to about 2 cm.
10. The side guide assembly of claim 6 wherein each side guide is transversely repositionably attached to a corresponding carriage by a catch pin cooperatively engaged within a transversely elongated slot.

11. A method of laterally repositioning a side guide on a friction sheet feeding machine, comprising the steps of:

- (a) obtaining a friction sheet feeding machine equipped with a repositionable side guide assembly wherein the side guide assembly includes at least:
 - (i) a support member attached to the friction sheet feeding machine,
 - (ii) a carriage repositionably mounted on the support member for selective lateral repositioning relative to the support member, and
 - (iii) a side guide configured and arranged for laterally guiding sheets through the friction sheet feeding machine, and repositionably attached to the carriage for transverse repositioning relative to the carriage as between a lower position and an upper position without detachment of the side guide from the carriage,
- (b) transversely repositioning the side guide from the lower position to the upper position without detaching the side guide from the carriage,
- (c) laterally repositioning the carriage and side guide relative to the support member with the side guide in the upper position, and then
- (d) transversely repositioning the laterally repositioned side guide from the upper position to the lower position.

12. The method of claim 11 wherein the side guide is transversely repositioned from the lower position to the upper position against a biasing force.

13. The method of claim 12 wherein the biasing force is gravity.

14. The method of claim 12 wherein the side guide is transversely repositioned from the upper position to the lower position by allowing the biasing force to return the side guide to the lower position.

15. The method of claim 13 wherein the side guide is transversely repositioned from the upper position to the lower position by allowing the biasing force to return the side guide to the lower position.

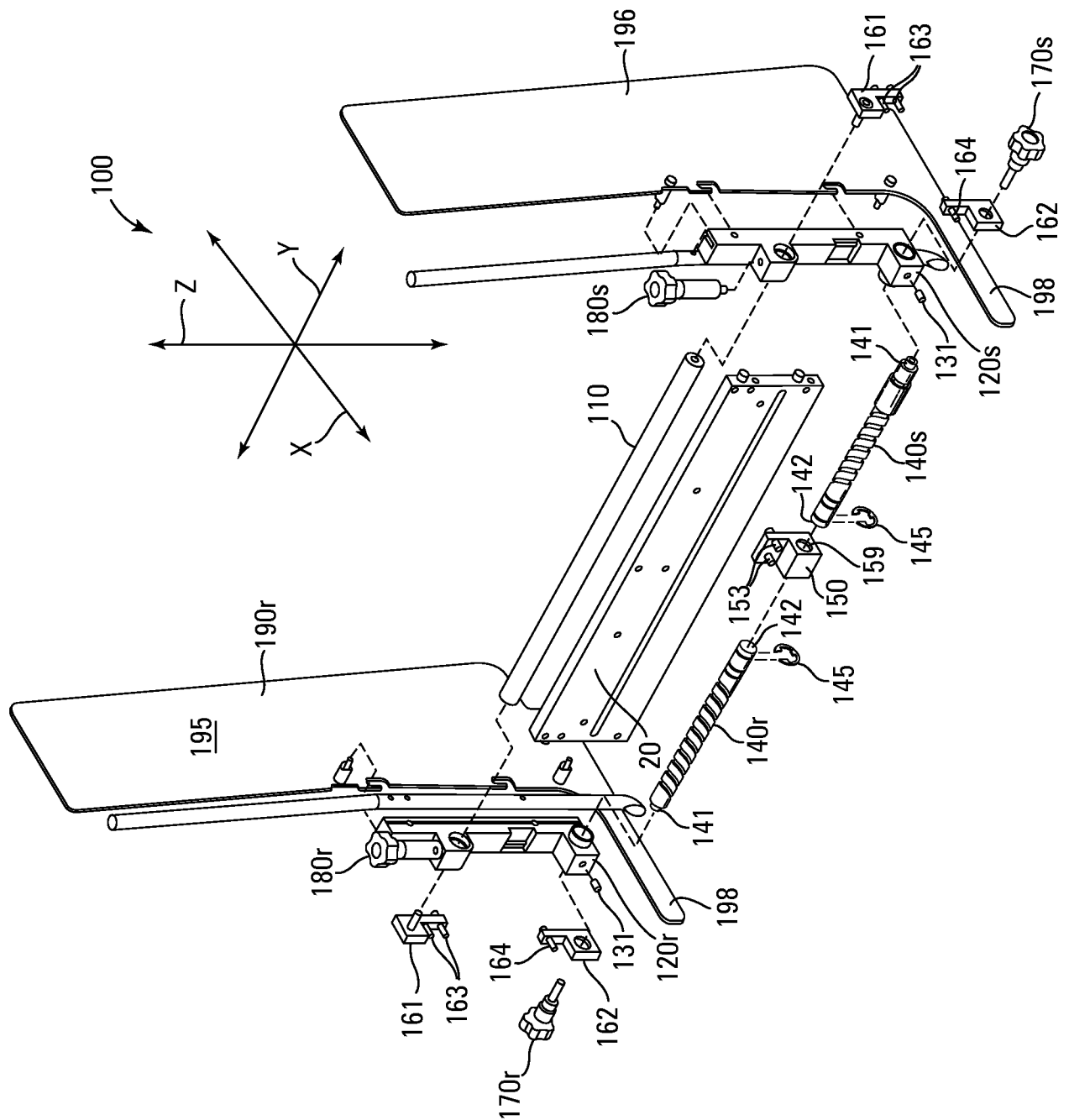
16. A method of laterally repositioning a side guide on a friction sheet feeding machine, comprising the steps of:

- (a) obtaining a friction sheet feeding machine equipped with a repositionable side guide assembly wherein the side guide assembly includes at least:
 - (i) a support member attached to the friction sheet feeding machine,
 - (ii) a pair of laterally spaced carriages, each repositionably mounted on the support member for selective lateral repositioning along the support member, and
 - (iii) a pair of laterally spaced side guides configured and arranged for laterally guiding sheets through the friction sheet feeding machine, each repositionably attached to one of the carriages for transverse repositioning relative to the carriage as between a lower position and an upper position without detachment of the side guide from the carriage,
- (b) transversely repositioning one of the side guides from the lower position to the upper position without detaching the one side guide from the carriage,
- (c) laterally repositioning the carriage attached to the one side guide relative to the support member with the one side guide in the upper position,
- (d) transversely repositioning the laterally repositioned one side guide from the upper position to the lower position,
- (e) transversely repositioning the other side guide from the lower position to the upper position without detaching the other side guide from the carriage,
- (f) laterally repositioning the carriage attached to the other side guide relative to the support member with the other side guide in the upper position, and
- (g) transversely repositioning the laterally repositioned other side guide from the upper position to the lower position.

17. The method of claim 16 wherein the side guides are transversely repositioned from the lower position to the upper position against a biasing force.

18. The method of claim 17 wherein the biasing force is gravity.
19. The method of claim 16 wherein the side guides are transversely repositioned from the upper position to the lower position by allowing the biasing force to return the side guides to the lower position.
20. The method of claim 19 wherein the side guides are transversely repositioned from the upper position to the lower position by allowing the biasing force to return the side guides to the lower position.

FIG. 1



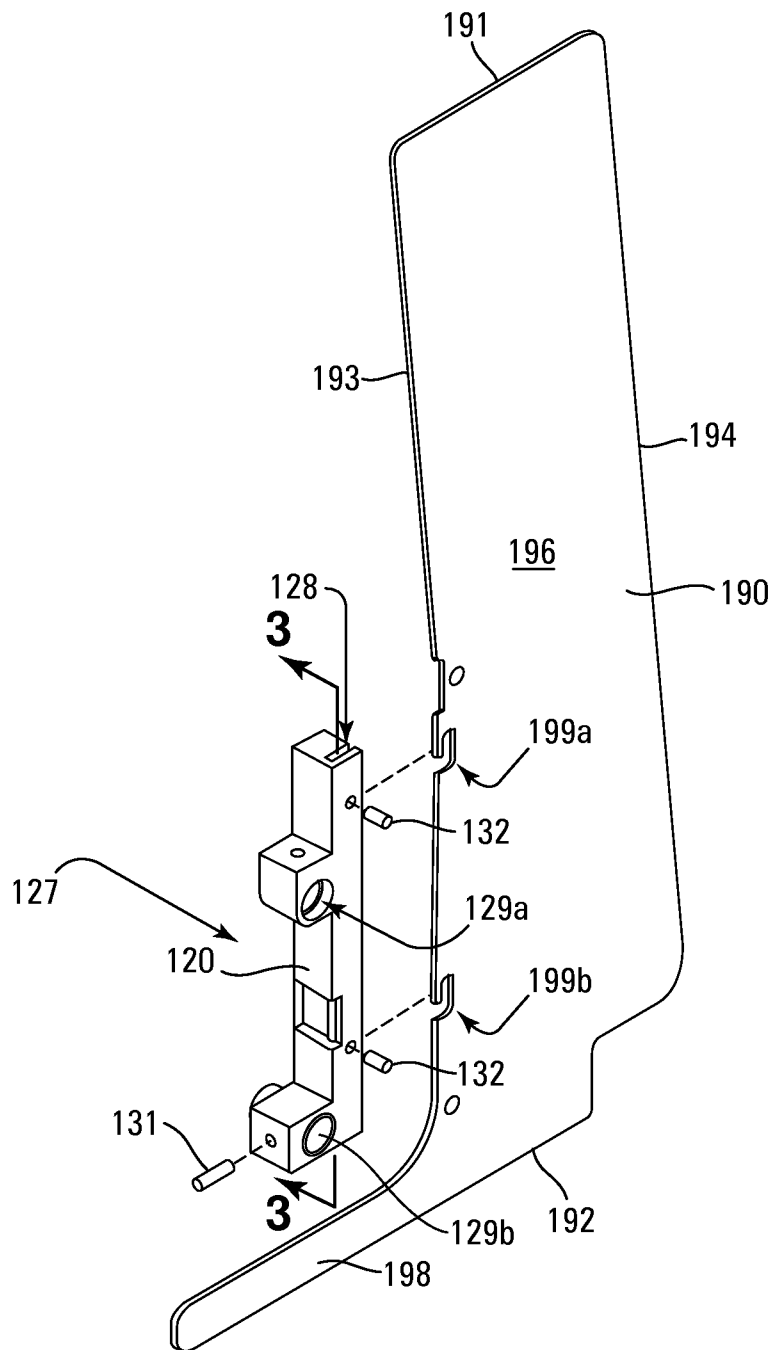


FIG. 2

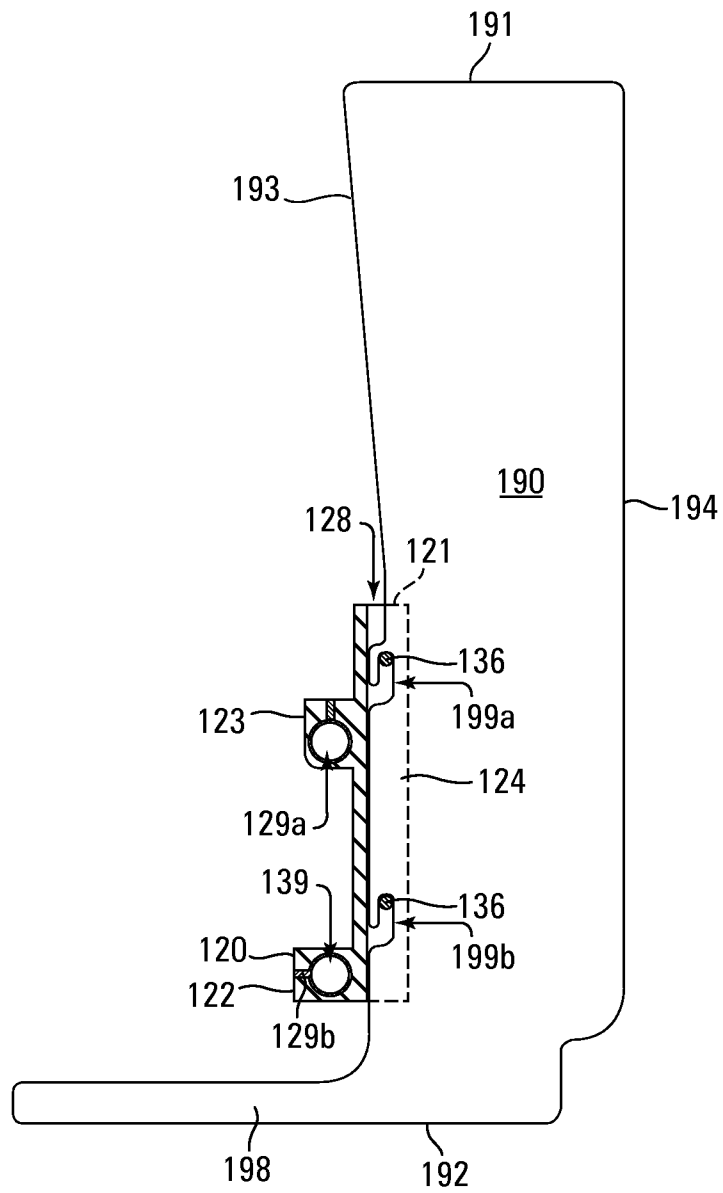


FIG. 3

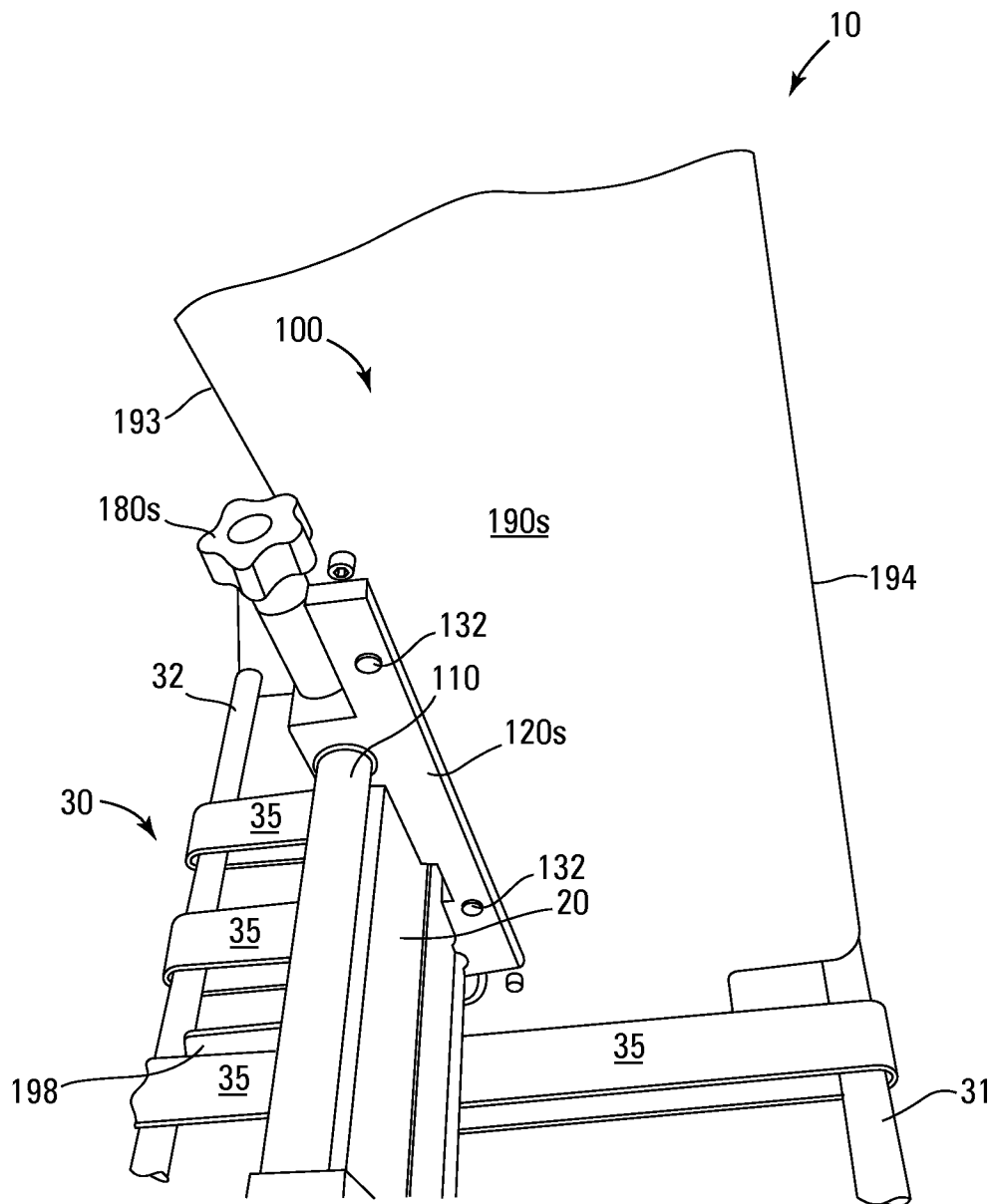


FIG. 4