July 14, 1959 L. R. HUFF 2,894,355

ENDLESS PAPER ROLL TYPE DRAFTING BOARD

Filed Nov. 22, 1957 5 Sheets-Sheet 1

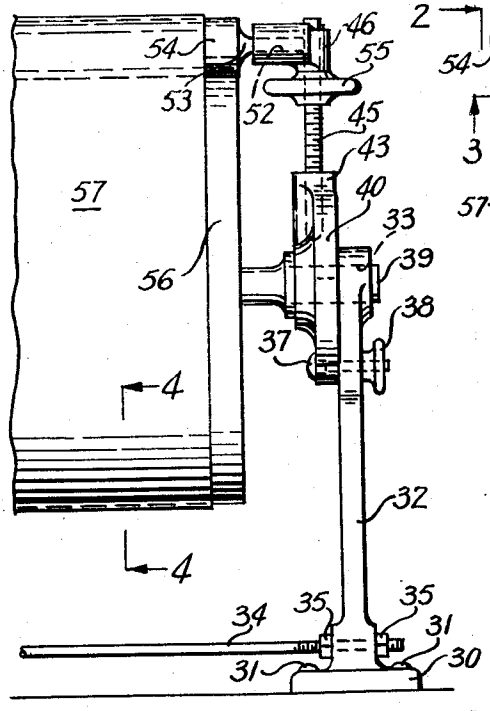


FIG. 2

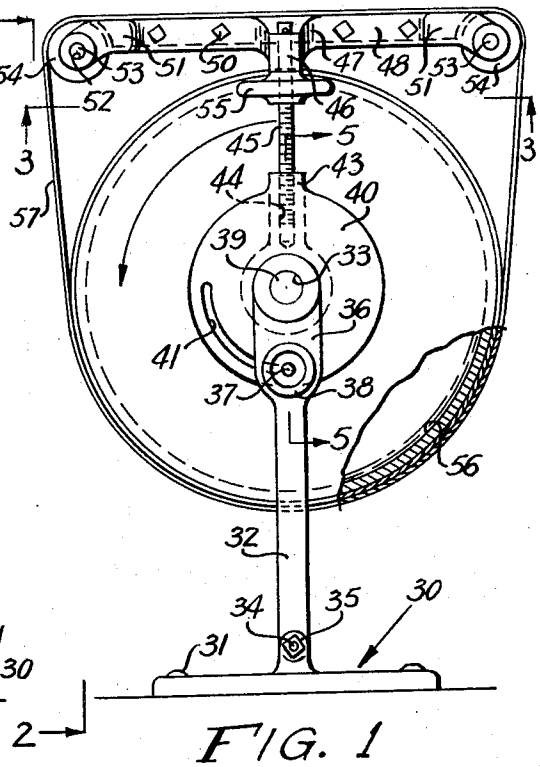


FIG. 1

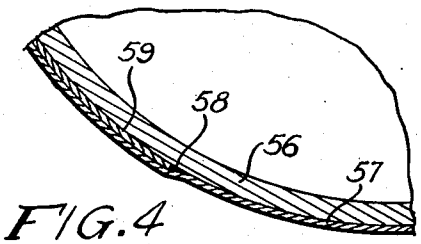


FIG. 4

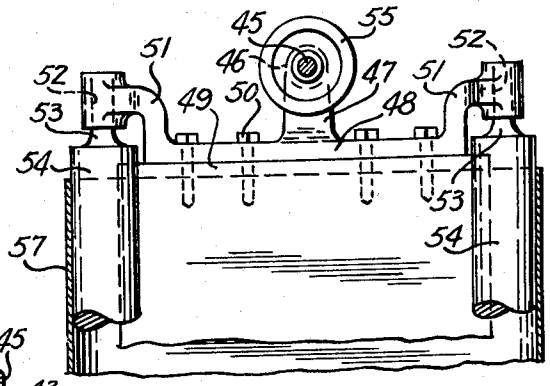


FIG. 3

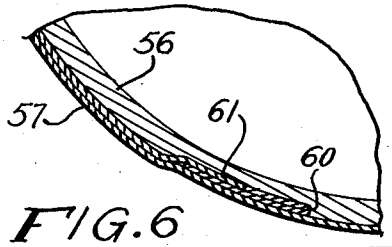


FIG. 6

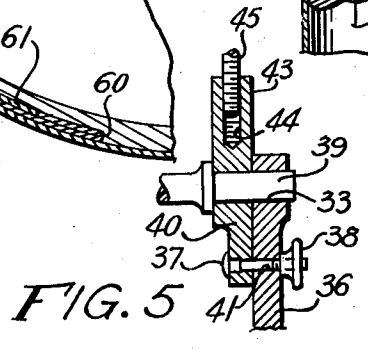


FIG. 5

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ENDLESS PAPER ROLL TYPE DRAFTING BOARD

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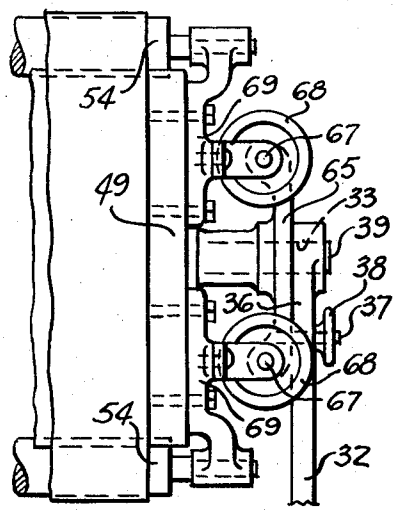


FIG. 8

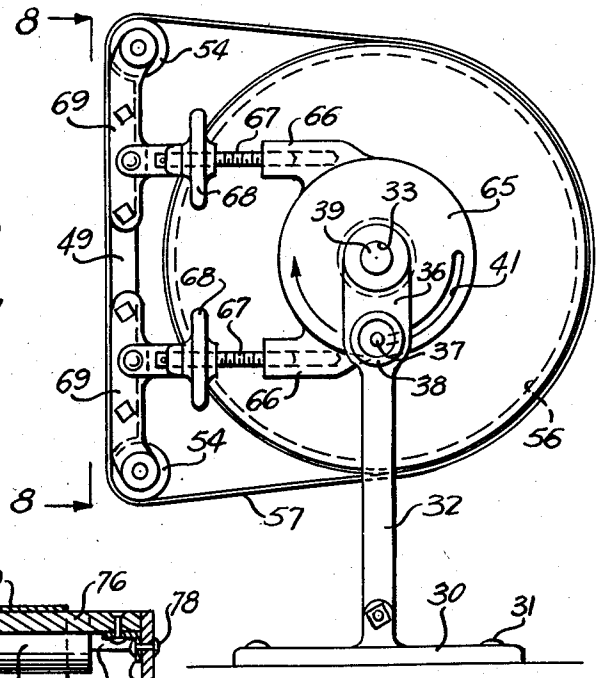


FIG. 7

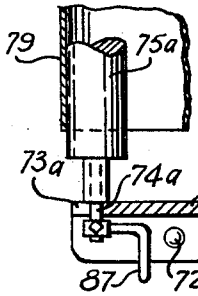


FIG. 11

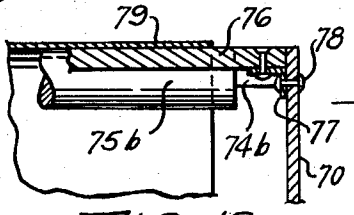


FIG. 12

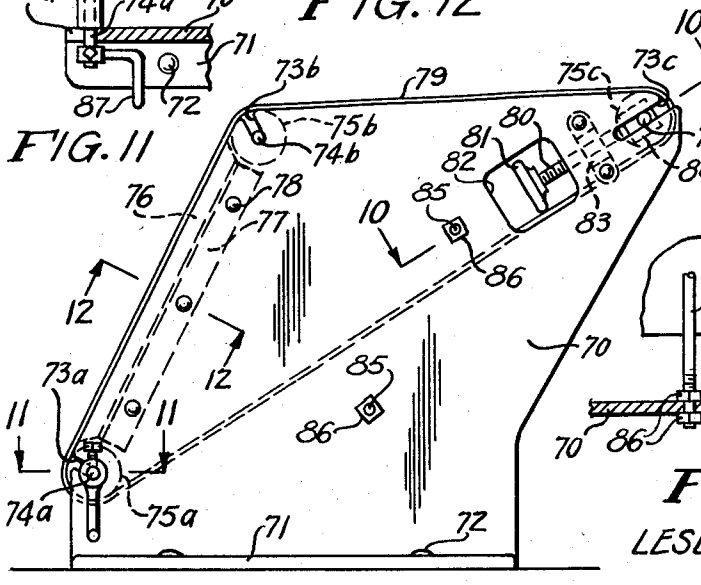


FIG. 9

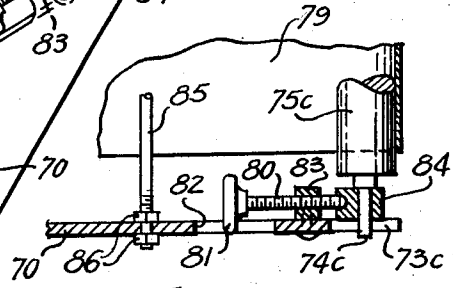


FIG. 10

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ENDLESS PAPER ROLL TYPE DRAFTING BOARD

Filed Nov. 22, 1957 5 Sheets-Sheet 3

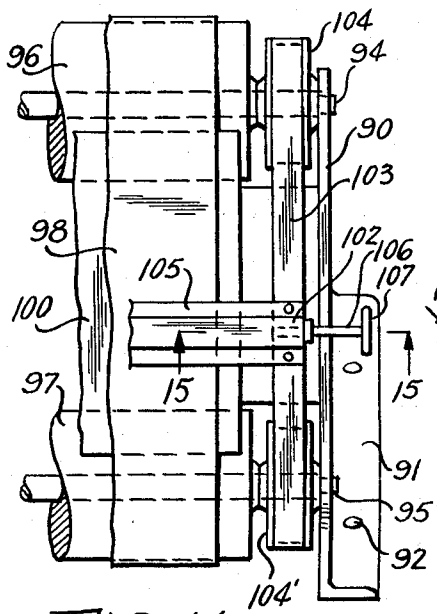


FIG. 14

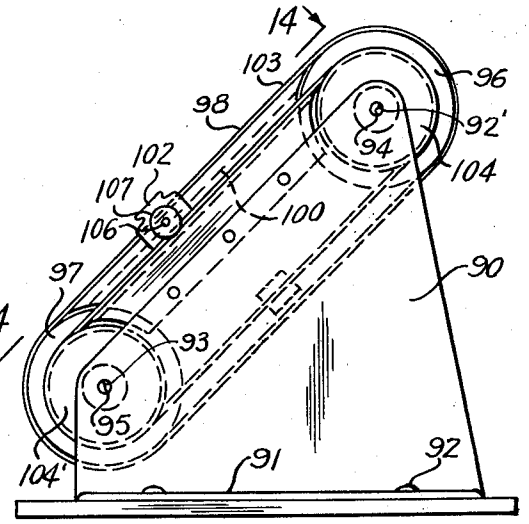


FIG. 13

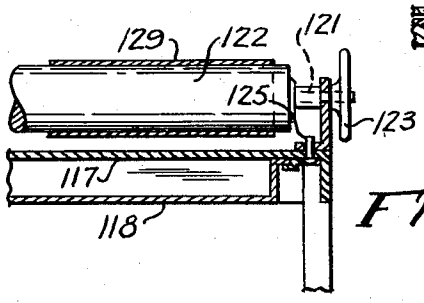


FIG. 18

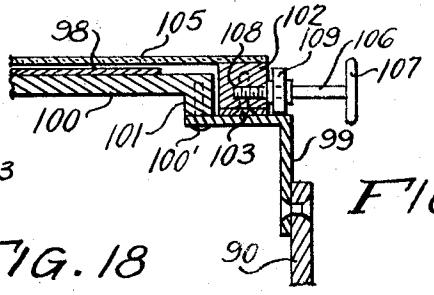


FIG. 15

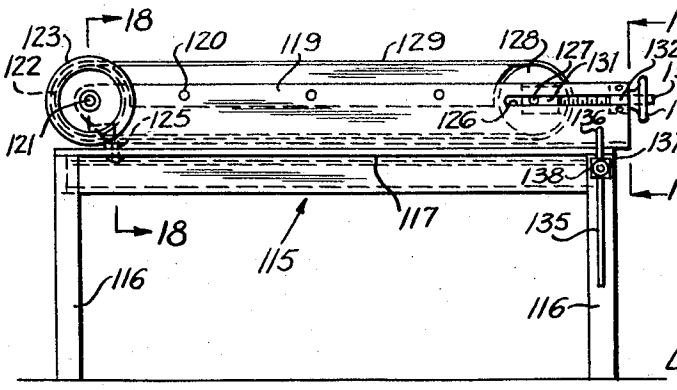


FIG. 16

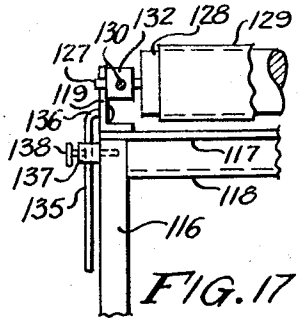


FIG. 17

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July 14, 1959 L. R. HUFF 2,894,355

ENDLESS PAPER ROLL TYPE DRAFTING BOARD

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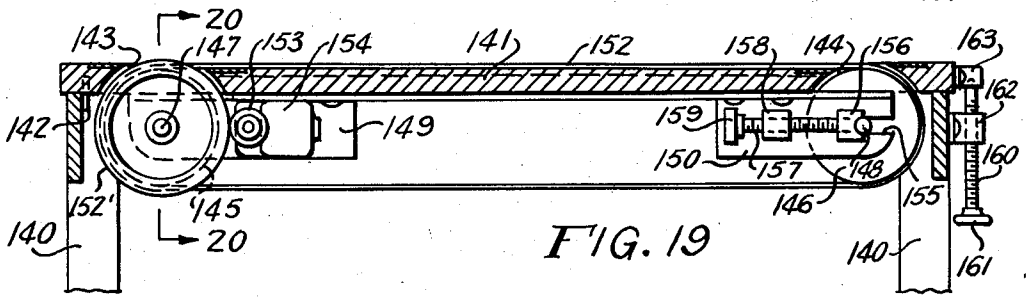


FIG. 19

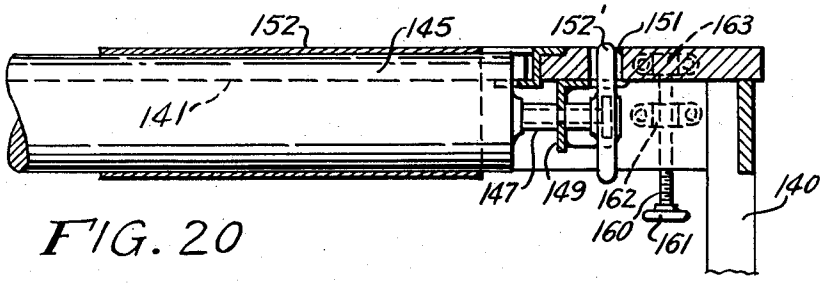


FIG. 20

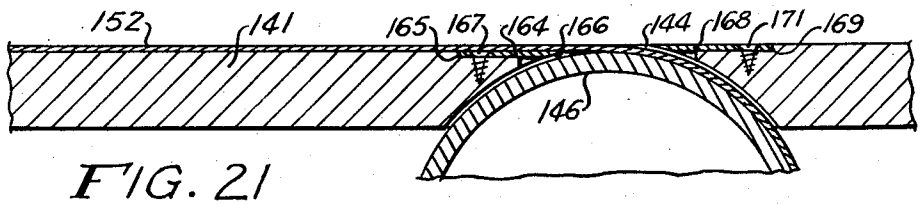


FIG. 21

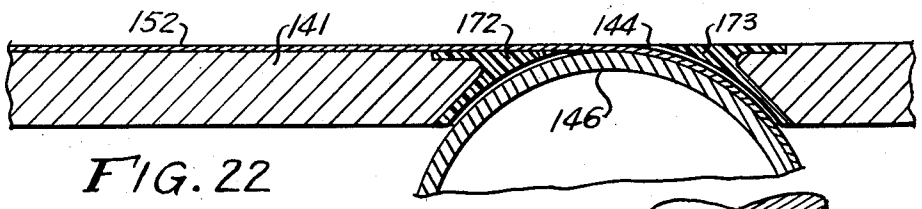


FIG. 22

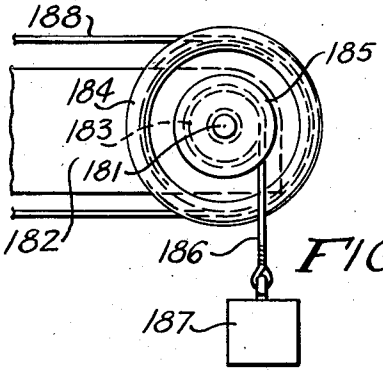


FIG. 24

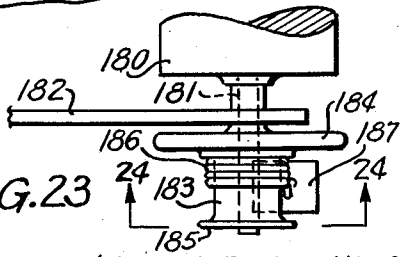


FIG. 23

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ENDLESS PAPER ROLL TYPE DRAFTING BOARD

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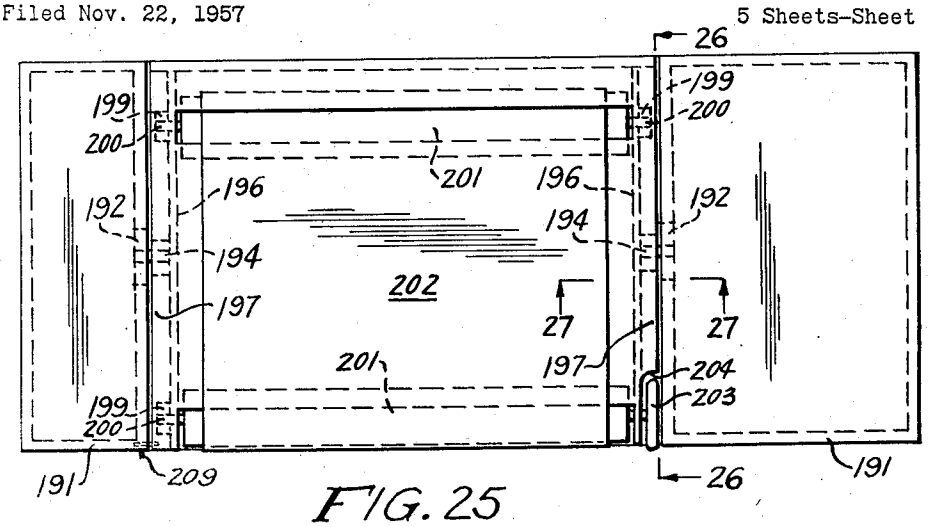


FIG. 25

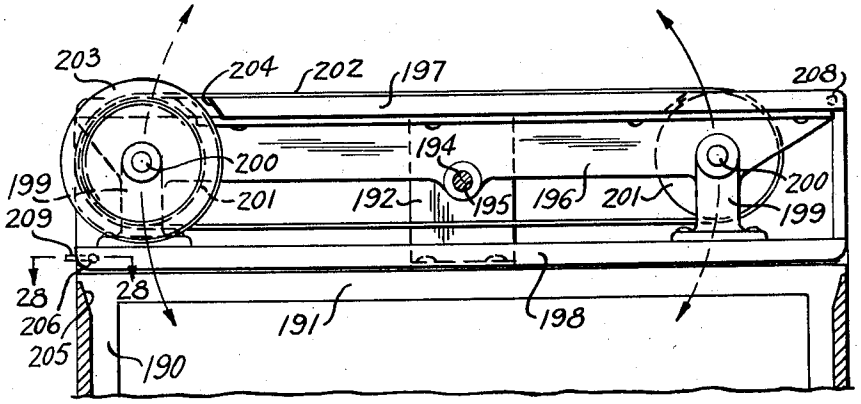


FIG. 26

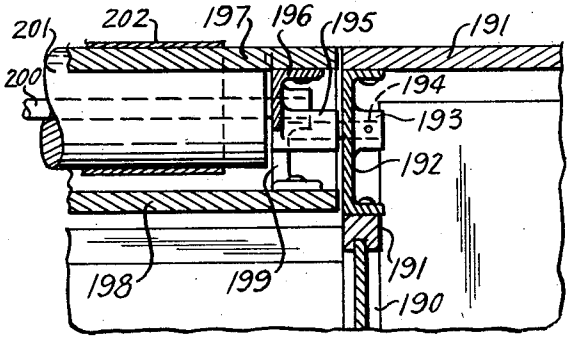


FIG. 27

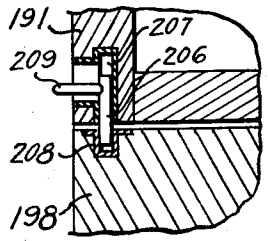


FIG. 28

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United States Patent Office 2,894,355 Patented July 14, 1959

2,894,355

ENDLESS PAPER ROLL TYPE DRAFTING BOARD

Leslie Royce Huff, Westwood, N.J.

Application November 22, 1957, Serial No. 698,297

4 Claims. (Cl. 45—131)

This invention relates to drafting mechanism, and has as its primary object the provision of an improved support for drafting paper, whereby the draftsman may work on drawings at conventional desk height, seated in an ordinary chair, thus obviating the necessity of being seated on a high, and usually backless, stool, or standing during long periods.

An additional object of the invention is the provision of a device of this character provided with an endless belt of drafting paper, which may be advanced as desired, or reversed, if necessary to continue certain portions of the drawing in a backward direction.

A further object of this invention is the provision of a device which may be suitably tilted to a desired angle to facilitate the draftsman's work.

A still further object of the invention is the provision of a device of this character provided with means for tensioning the paper to the desired degree.

A specific object of the invention is the provision of one form of frame having an integral and movable straight edge thereacross.

An additional object of the invention is the provision of such a device which may be adjusted to a desired angle, and latched in such position.

A further specific object of one form of this invention is the provision of such a device which may be readily placed on a desk top or the like.

Still another specific object of the invention is the provision of such a device which may be built into a specially recessed desk top, to facilitate work at desk top level.

Still another specific object of the invention is the provision of such a device provided with a weight for facilitating moving of the endless belt of drafting paper.

An additional specific object of the invention is the provision of a device of this character having a work surface adapted to overlie suitable rollers carrying the endless paper belt, and provided with marginal flanges, to provide a substantially continuous smooth topped working surface up to the point of engagement with the top of an adjacent roller.

A further object of the invention is the provision of a device of this character which will facilitate the work of a draftsman, enable him to work in greater comfort, and, consequently, increase productive efficiency.

An additional object of the invention is the provision of a device of this character which is sturdy and durable in construction, reliable and efficient in operation, and relatively simple and inexpensive to manufacture, assemble and utilize.

Still other objects reside in the combinations of elements, arrangements of parts, and features of construction, all as will be more fully pointed out hereinafter, and disclosed in the acompanying drawings, wherein there are shown preferred embodiments of this inventive concept.

In the drawings:

Figure 1 is an end elevational view of one form of device embodying features of this invention, portions thereof being broken away.

Fig. 2 is a fragmentary side elevational view of the device taken substantially along the line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 1 as viewed in the direction indicated by the arrows.

Fig. 4 is a fragmentary sectional view taken substantially along the line 4—4 of Fig. 2 showing a method of joining the ends of the endless paper belt.

Fig. 5 is a fragmentary sectional view taken substantially along the line 5—5 of Fig. 1 as viewed in the direction indicated by the arrows.

Fig. 6 is a view similar to Fig. 4, but showing a modified method of connecting the ends of the papers.

Fig. 7 is a view similar to Fig. 1, but disclosing a modified form of construction.

Fig. 8 is a side elevational view of the structure of Fig. 7, taken substantially along the line 8—8 of Fig. 7 as viewed in the direction indicated by the arrows.

Fig. 9 is an end elevational view of a still further modified form of construction, certain concealed parts thereof being indicated in dotted lines.

Fig. 10 is a sectional view taken substantially along the line 10—10 of Fig. 9 as viewed in the direction indicated by the arrows.

Fig. 11 is a sectional view taken substantially along the line 11—11 of Fig. 9 as views in the direction indicated by the arrows.

Fig. 12 is a fragmentary sectional view taken substantially along the line 12—12 of Fig. 9 as viewed in the direction indicated by the arrows.

Fig. 13 is an end elevational view of a still further modified form of construction.

Fig. 14 is a fragmentary plan view of the structure of Fig. 13, taken substantially along the line 14—14 of Fig. 13 as viewed in the direction indicated by the arrows.

Fig. 15 is a fragmentary sectional view taken substantially along the line 15—15 of Fig. 14 as viewed in the direction indicated by the arrows.

Fig. 16 shows a still further modified form of this invention adapted to be positioned on a desk or table top.

Fig. 17 is a fragmentary sectional view taken substantially along the line 17—17 of Fig. 16 as viewed in the direction indicated by the arrows.

Fig. 18 is a fragmentary sectional view taken substantially along the line 18—18 of Fig. 16 as viewed in the direction indicated by the arrows.

Fig. 19 shows a still further modified form of the invention adapted to be positioned in a specially recessed desk top or the like, but otherwise similar in general construction to that of the modification of Fig. 16.

Fig. 20 is a fragmentary sectional view taken substantially along the line 20—20 of Fig. 19 as viewed in the direction indicated by the arrows.

Fig. 21 is an enlarged fragmentary detail sectional view, showing a constructional detail of the apparatus of Fig. 19.

Fig. 22 is a view similar to Fig. 21, but showing a slight modification in the detail thereof.

Fig. 23 is a fragmentary top plan view of a modified constructional detail, adapted for use with the structure of Figs. 16 or 19.

Fig. 24 is an elevational view taken substantially along the line 24—24 of Fig. 23 as viewed in the direction indicated by the arrows.

Fig. 25 is a top plan view of a still further modified form of construction, certain concealed elements being indicated in dotted lines.

Fig. 26 is a sectional view taken substantially along the line 26—26 of Fig. 25 as viewed in the direction indicated by the arrows.

Fig. 27 is an enlarged fragmentary detail sectional view taken substantially along the line 27—27 of Fig. 25, and,

Fig. 28 is a fragmentary sectional view taken substantially along the line 28—28 of Fig. 26, as viewed in the direction indicated by the arrows, and on an enlarged scale.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Having reference now to the drawings in detail, and more particularly to that species of the invention disclosed in Figs. 1 to 5 inclusive, there is generally indicated at 30 a base member, which may be suitably secured to the floor as by means of bolts 31 or the like, which includes upright or standard 32, terminating in a journal 33. The base 30 comprises one of a spaced apart pair, which are connected by means of a tie rod 34, secured in position by means of oppositely disposed lock nuts 35. The upper portion of standard 32 terminating in the journal 33 is enlarged as at 36, and includes an aperture through which extends a bolt 37, and a knurled adjusting nut 38. The journals 33 accommodate the ends of an axle 39, which is provided adjacent its ends with a disc-like member 40, having an arcuate slot 41 therein, through which the bolt 37 extends, for a purpose to be more fully described hereinafter.

The disc 40 carries at one portion of its periphery a boss 43, which has an internally threaded bore 44 adapted for the reception of one end of a screw 45, upon the upper end of which is mounted a lug 46, having a lateral extension 47, to which is secured a transversely extending plate or bar 48. Between the opposite bars 48, there is positioned a drawing board 49, secured in position as by means of bolts 50. The opposite ends of each plate 48, of which there are two at opposite sides of the board 49, carry offset projections 51, provided with bores 52 forming journals for the ends of axles 53 of rollers 54 which extend transversely between the two standards 32.

A tensioning knob 55 having an internally threaded bore, surrounds screw 45 for a purpose to be more fully described hereinafter.

The axle 39 carries a relatively large drum 56, it being noted that each disc 40 is fixedly secured to its associated end of axle 39.

A sheet of drafting paper 57 is positioned about drum 56 and both of rollers 54, as best shown in Figure 1, and may have its ends secured together in the manner shown in Fig. 2, by tapering one end as at 58, and allowing the other end to overlap as shown at 59 to a suitable distance.

From the foregoing, the use of the device should now be readily understandable. An endless sheet of drafting paper 57 is first positioned about drum 56 and rollers 54, and sealed in any desired manner, such as that previously described. The paper may now be tensioned by rotation of hand wheel 55, which will move the drafting board 49 a sufficient distance to tension the paper. Similarly by loosening the hand nut 38, the axle, and hence the discs 40 and their associated end plates 48 may be tilted to any desired angle within 90°. Tightening of the nut 38 will obviously lock the element in the desired position.

Fig. 6 discloses a slightly modified form of the invention, wherein the roller or drum 56 is provided with a recess 60, in order to accommodate one end 61 of the paper 57, in such manner that no bulge is provided at the overlap.

The modification of Fig. 7 and Fig. 8 is substantially identical to that described in connection with the preceding modification, with the exception that for the disc 40 there is substituted a disc 65, which is provided with

two bosses 66 having threaded bores therein for the accommodation of screws 67, upon which operating wheels or knobs 68 are positioned. The opposite ends of the screws 67, instead of engaging single plates 48 at either end, engage pairs of spaced plates 69, secured to the board 49 in spaced apart relation. This permits a slightly greater facility of adjustment, in angularity of the board. The arrangement of the disc 65 and its mounting permits this mechanism to be moved throughout a 90° angle, in a manner identical to that previously disclosed. The reference characters appearing on this form represent corresponding parts identical to those of the preceding modification.

Figs. 9 to 12 inclusive, disclose a further modified form of this inventive concept, adapted to be mounted on a desk or the like, and comprise two spaced apart end plates 70, each provided with a flange 71, adapted to be secured to a desk top or the like, as by means of bolts 72. Each of the end plates 70 is provided with slots 73*a*, 73*b* and 73*c* at each of three triangularly disposed points. The slots in the opposite end plates are aligned, and provide journals for the axles 74*a*, 74*b* and 74*c* of rollers 75*a*, 75*b* and 75*c*. A suitable drafting board 76 extends transversely between the two opposed plates 70, and in angularly inclined relation between the rollers 75*a* and 75*b*. The board is adapted to be secured to the end plates, as by means of flanges 77 and bolts 78 or the like.

An endless sheet of paper 79 extends about the three rollers, and may be tensioned by means of oppositely disposed tensioning screws 80 provided with heads 81, which are accessible through suitable apertures 82 in the plate 70. Each of the screws 80 passes through a threaded boss 83, fixedly secured to each of the side plates 70, and engages a movable block 84, provided with an aperture, through which the axle 74*c* of roller 75*c* extends. It will be readily apparent that upon suitable adjustment of the adjusting knobs 81, the paper may be tensioned to a desired degree.

As best shown in Fig. 10, it will be noted that suitable tie rods 85 secured in position as by means of lock nuts 86, extend between the spaced end plates 70 to insure rigidity of the assembly.

The axle 74*a* is provided at one or both ends with a crank member 87, by means of which roller 75*a* may be rotated to adjust the position of the paper 79.

Figs. 13, 14 and 15 disclose a still further modified form of construction wherein end plates 90 provided with flanges 91 are adapted to be secured as by means of bolts 92 to a table top or similar surface. The upper surface of the plates 90 is inclined in any desired angle, and carries at its extremities journals 92′ and 93, which in turn carry the axles 94 and 95 of rollers 96 and 97 respectively. An endless sheet of drafting paper 98 is adapted to surround the rollers 96 and 97, and may have its ends secured together in any desired manner, and be tensioned in any desired manner, as in the foregoing. Each of the plates 90 has secured thereto a channel iron in the form of an inverted L, as indicated at 99, which extends substantially the full length of the upper edge of each plate 90. A drawing board 100 is secured, as by means of bolts or the like, 101, to the upper horizontal leg of each member 99, but spaced from the end thereof to provide a guide channel. Each edge of the drawing board has a depending portion 101, forming a straight edge, to serve as a guide for a block 102, which is affixed to an endless belt 103, which passes about pulleys 104 and 104′, respectively, at each end of each of rollers 96 and 97, and carried by the axles 94 and 95, respectively. Extending between the opposed blocks 102 is a straight edge 105, securely fixed between the blocks 102, and so arranged as to be maintained in transverse alignment directly across the paper by means of the guide surfaces afforded by the inner edges of the depending portions 101.

Means are provided for adjusting the position of the straight edge **105**, and comprise shafts **106** terminating in operating knobs **107**, and having threaded ends **108** engaging in each of blocks **102**. Each shaft carries a roller **109**, which rides along the top surface of angle iron member **99**, adjacent the edge thereof, so that rotation of either knob **107** will occasion movement of both of the endless belts **103** simultaneously, to effect movement of the straight edge over the paper, and maintaining the constant alignment thereof.

Still another modified form of the device is shown in Figs. 16, 17 and 18. This is a simplified form of the invention, and is particularly adapted for mounting on a frame having a horizontal top surface.

In this modification there is generally indicated at **115** a frame including angle iron legs **116**, and a top **117**, with underlying reinforcing members **118**. A pair of opposed substantially rectangular end plates **119**, are positioned on the top **117**, and connected together as by means of tie rods **120** or the like. A journal is formed at one end of each plate **119** for the reception of an axle **121** at either end of a roller **122**. An operating knob or wheel **123** is provided for rotating the roller **122**. The ends of each member **119** adjacent the roller **122** are loosely mounted on pins **125**, which project upwardly through the top **117** of the frame.

The other end of each member **119** is provided with an elongated slot **126**, which serves to journal the axle **127** of a roller **128**. Tensioning means is provided for an endless roll of paper **129** extending about rollers **128** and **122**, and comprises a threaded member **130**, which threadedly engages in a block **131** carried by each end of the axle **127**, the threaded member being seated in a second block **132** fixedly secured to the end of one of each of side plates **119**. Obviously, rotation of an operating knob **133** carried by the end of threaded member **130** will occasion movement of the blocks **131**, and corresponding movement of the roller **128** to tension the paper **129** passed thereabout.

Means are provided for varying the relative angular inclination of the side members **119**, to vary the angular relationship of the paper **129**. These means take the form of depending rods **135**, having right angularly disposed portions **136**, which extend through the side plates **119**. Each of these rods passes through an aperture in a fixed lug **137** secured adjacent the table top **117**, and is slidable therein, to a limited distance.

The rods **135** are adapted to be held in clamping relation by means of set screws **138**. It will thus be seen that in this modification, the angular relationship of the device may be varied within a limited range, by the loosening adjustment of set screws **137**, and corresponding adjustment of the rods **135**. In this modification, the drawing board (not shown) is preferably carried by the transverse members **120**, to underlie the top flight of the endless belt of paper.

Figures 19 to 21 inclusive disclose a still further modified form of the invention adapted to be inset within the body of a table or the like, wherein the top of the table may be utilized as a drafting board. In this modification of the invention, the table includes legs **140**, and a top **141** loosely mounted thereon, as by means of loosely mounted pins **142**. The table top is provided with transversely extending slots **143** and **144** adjacent opposite ends thereof, the slots having arcuate sides, for the accommodation of rollers **145** and **146** respectively. The rollers are mounted on axles **147** and **148**, respectively, which are journaled in suitable depending flanges **149** and **150**, respectively, extending along opposite sides of the table.

Adjacent each end of slot **143** is a secondary slot **151**, through which projects the upper rim of an adjusting knob or wheel **152'** carried by axle **147**, for rotating the roller **145**, and hence adjusting the position of an endless sheet of paper **152**, which surrounds rollers **145** and **146**.

The upper flight of the sheet of paper **152** passes over the table top, as best shown in Fig. 19, while the lower flight passes therebeneath. A friction roller **153** carried by a suitable bracket **154** extending from each of plates **149** bears against the roller **145** to preclude excess rotation thereof.

The end of each plate **150** is provided with a slot **155** which provides a journal for the axles **148**. Tensioning means are provided, and take the form of a block **156** carried by one end of the screw threaded member **157**, which is mounted in a bracket **158** having a threaded bore therethrough, the screw being provided with a head **159** for rotation thereof. Obviously, rotation of the knob **159** varies the position of the axle **148**, in a manner similar to certain modifications hereinbefore described, in such manner as to adjust the tension of the paper **152**.

A height adjusting means is provided by means of a screw **160**, having an operating knob **161**, which engages through a threaded bore in a bracket **162** secured to a side frame member of the table. The end of the screw is mounted rotatably in the lug **163**, carried by the table top, so that the table top may be slightly tilted about the pins **142** as desired.

Means are provided, as best shown in Fig. 21, for insuring the even travel of the paper over the rollers, and comprise metal plates **164** seated in recesses **165** in table top **141**, the ends of the plates being arcuately beveled as at **166**, and the plates being secured in position as by means of screws **167**.

The plates **164**, together with plates **168** on opposite sides of each of the slots **143** and **144** provide guides whereby the paper **152** may pass smoothly about the associated roller. The plates **168** are also seated in suitable recesses **169** in the table top, and provided with arcuate extremities **170** conforming generally to the configuration and curvature of the adjacent roll, and are secured in position by means of screws **171**.

Fig. 21 shows a slightly modified form of construction, wherein the paper **152** passing over table top **141** and passing into slot **144**, instead of passing between metal plates, passes over a corresponding plastic inset **172**, having an under surface adapted to conform to the configuration of the adjacent roller **146**, and wherein the edge of the slot **144** is so formed as to receive projecting legs of the plate **172**. An oppositely positioned plastic plate **173** overlies the paper on the opposite side of slot **144**. These plates **172** and **173** may be molded, and fixed to the appropriate edges of the slots to which they relate in any desired conventional manner.

Figs. 23 and 24 show a tensioning mechanism, which is adapted to be employed with any of the modifications previously described, and which includes a roller **180** having an axle **181** suitably journaled in a plate **182**, and which extends beyond the plate. The axle carries a drum **183**, and a rotatable hand wheel **184**. The drum has an outer flange **185**, and has suitably wound thereabout a cord **186**, from one end of which depends a weight **187**. It will be obvious that the effect of the weight on the cord **186** is sufficient normally to hold the paper **188** suitably tensioned.

Figs. 25, 26 and 27 disclose a still further modified form of this invention. In this form of the invention, there is provided a supporting frame, including legs **190**, and transverse supporting members **191**. Each side portion **191** carries a bracket **192**, and each bracket is provided with a journal **193**. The journals receive the ends of a shaft **194**, the opposite end of which carries a rotatable bushing **195**, which is secured to a bracket member **196**, extending the full length of two parallel board surfaces **197** and **198**. The board or plate **198** carries at its opposite ends lugs **199**, which are provided with journals, for the axles **200** of identical rollers **201**.

The rollers **201** carry an endless sheet of drafting paper **202**, which passes over the top board **197**, which thus serves as a drawing board. Any suitable tension-

ing means for the papers, such as described in the foregoing modifications, may be employed if desired.

One of rollers 201 carries an adjusting wheel 203, which extends through a suitable slot 204 in the upper surface of board 197. The arrangement is thus such that the entire assembly is tiltable about the axle 194 to any desired degree, it being noted that the upper ends of the legs 190 are beveled, as at 205, to permit free passage of the lower board or plate 198 therepast.

Latch means are provided for holding the assembly comprised of boards 197 and 198 in horizontal position, and take the form of a detent 206, carried within a metallic receptacle 207 in lower board 198, which is engageable in a metal cup 208, in one of members 191, a laterally extending pin 209 being provided for releasing the detent 206 to permit rotation of the entire assembly about the axle 194.

It will be obvious, therefore, that with the detent 206 engaged in the metal cup 208, the top board 197, which serves as a drafting board, over which the roll of paper 202 passes, is held in horizontal position, but that upon release of the detent same may be rotated to any desired angle for a particular operation, or rotated so that lower board 198 becomes the top or parallel to the top of the table.

From the foregoing, it will now be seen that there is herein provided an improved drafting mechanism, in a wide variety of forms, which provides great facility in expediting a drafting operation, which may be arranged in accordance with desired conditions, and which accomplishes all of the objects of this invention, and others, including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiments hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative, and not in a limiting sense.

What I claim is:

1. An endless paper roll type drafting board comprising an assembly embodying bracket members disposed in parallel spaced relation with respect to each other, a pair of horizontally disposed rollers mounted on the ends of said brackets, said rollers being disposed in parallel spaced relation to each other, drafting boards secured to said bracket members, said drafting board being secured between said rollers, an endless sheet of drafting material extending about said rollers and over said drafting board, a frame supporting said assembly, means pivotally mounting said assembly centrally of said frame, and a latch for holding said assembly in position.

2. The subject matter as claimed in claim 1, and one of said drafting boards extending beyond said rollers to form a desk-type board when said assembly is in one position of pivotal adjustment.

3. The subject matter as claimed in claim 2, with means of varying the tension of said drafting material.

4. The subject matter as claimed in claim 1, and said frame supporting assembly including a horizontal shaft, said assembly pivotal mounting means comprising a bracket having a journal with an open upper side in which said horizontal shaft of said frame supporting assembly is removably mounted.

References Cited in the file of this patent

UNITED STATES PATENTS

832,967	Grinnell	Oct. 9, 1906
902,494	Johannesmeyer	Oct. 27, 1908
1,720,121	Ewald	July 9, 1929
1,934,952	Shoemaker	Nov. 14, 1933
2,632,975	Klabunde	Mar. 31, 1953
2,641,082	Stults	June 9, 1953
2,652,657	Joy	Sept. 22, 1953
2,688,818	Joy	Sept. 14, 1954
2,703,468	Sheinwald	Mar. 8, 1955
2,805,479	Droste	Sept. 10, 1957