June 14, 1960 C. L. DEEKEN 2,940,752

STEERING ROLL CONSTRUCTION

Filed Feb. 27, 1958

3 Sheets-Sheet 1

Fig. 2.

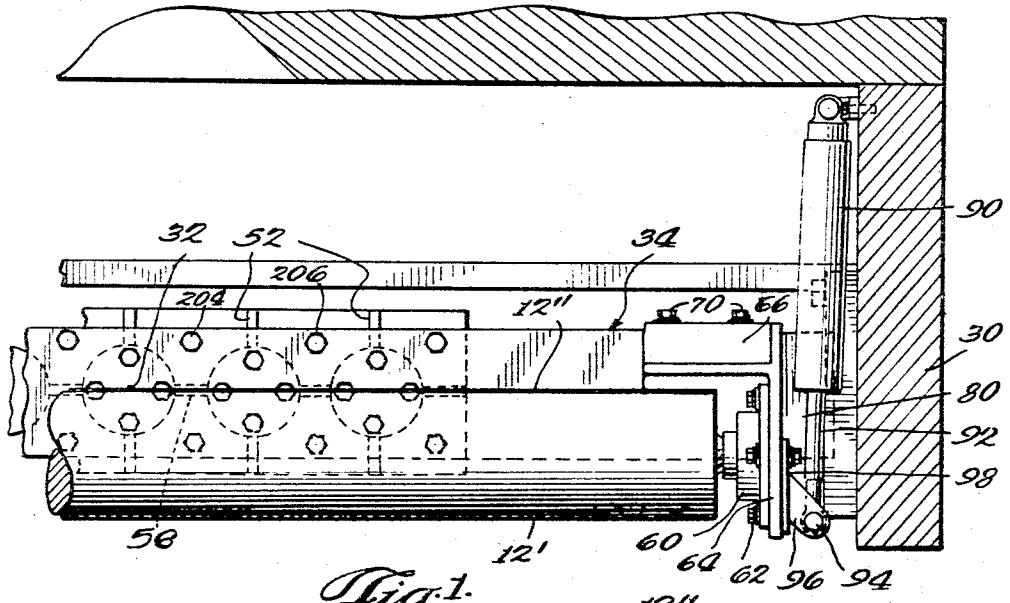
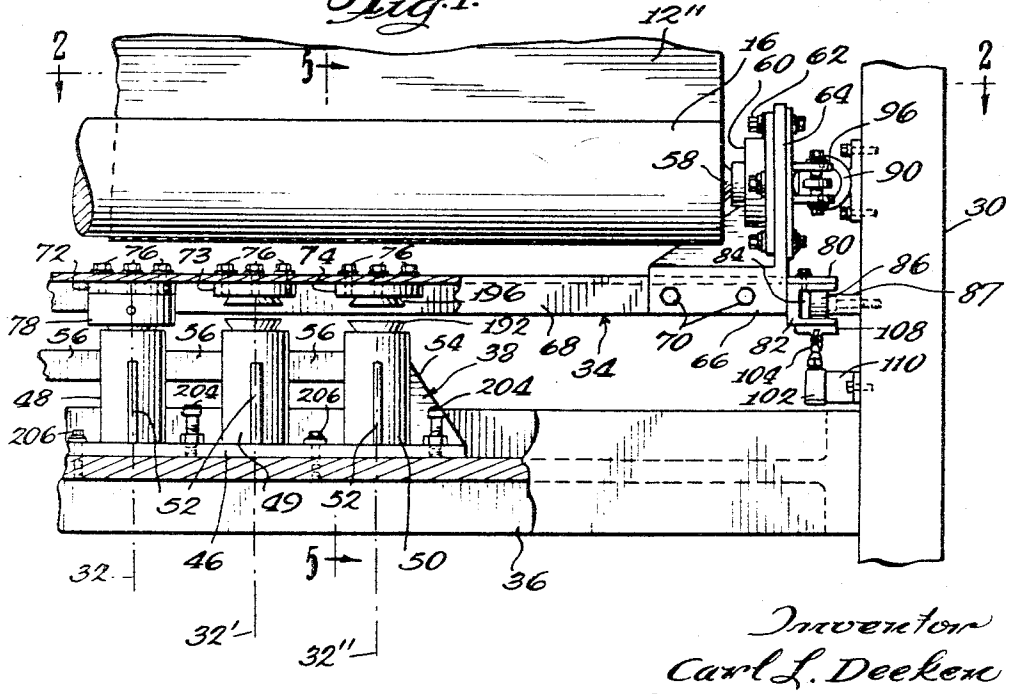


Fig. 1.



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Fig. 4.

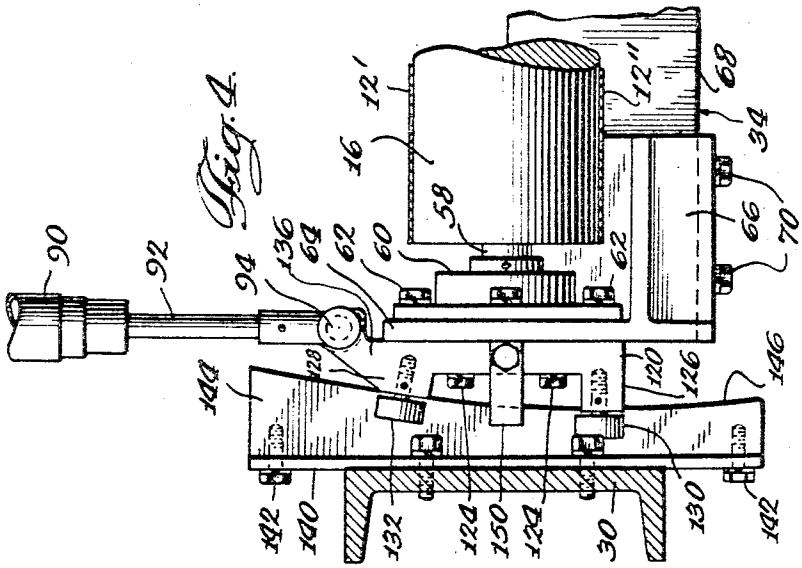


Fig. 3.

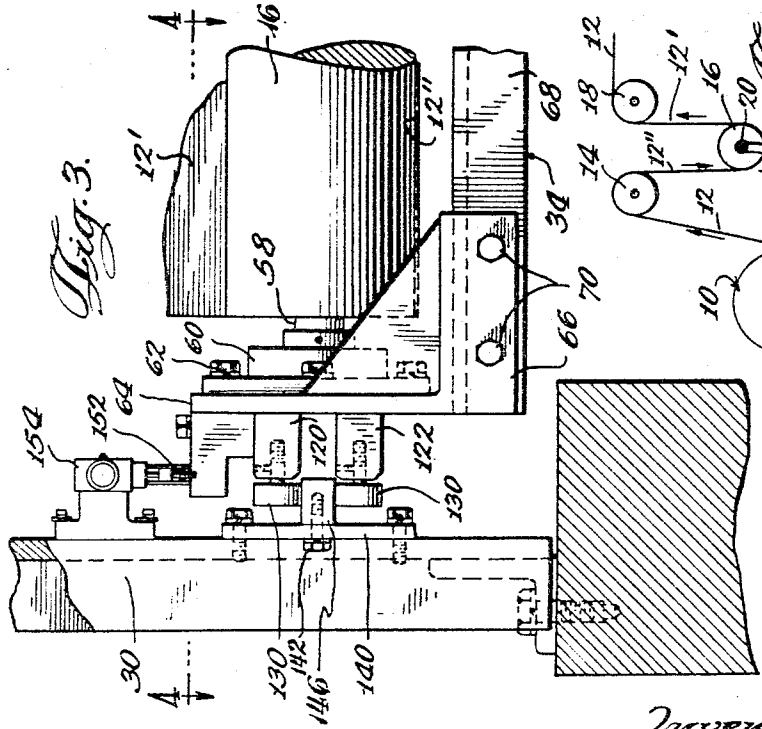


Fig. 7.

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Fig. 6.

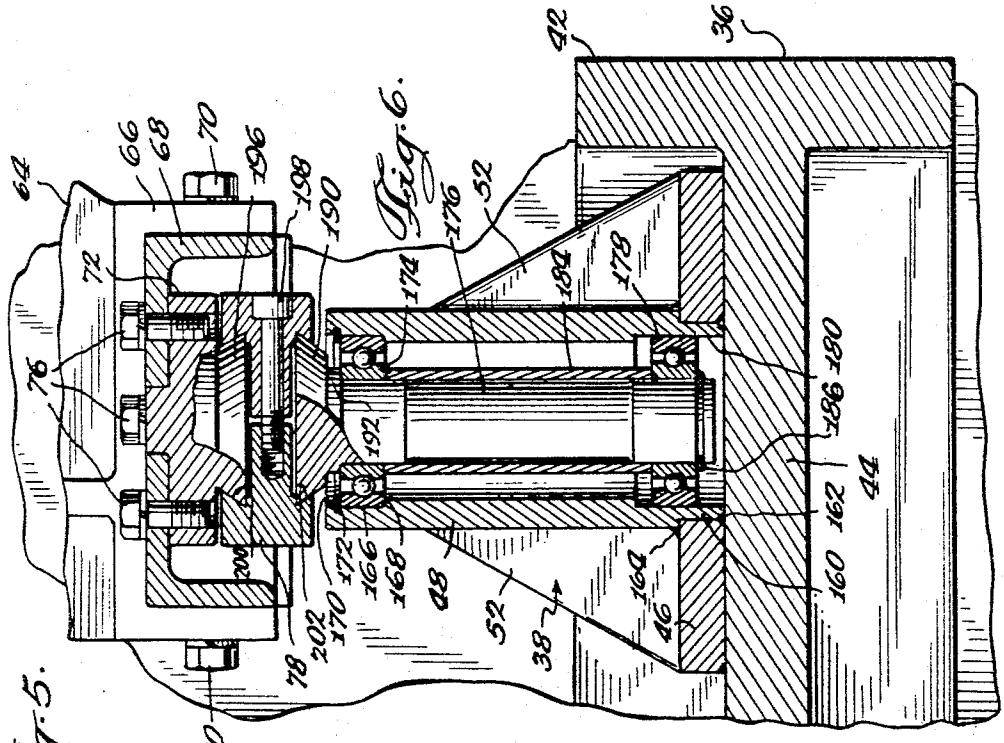
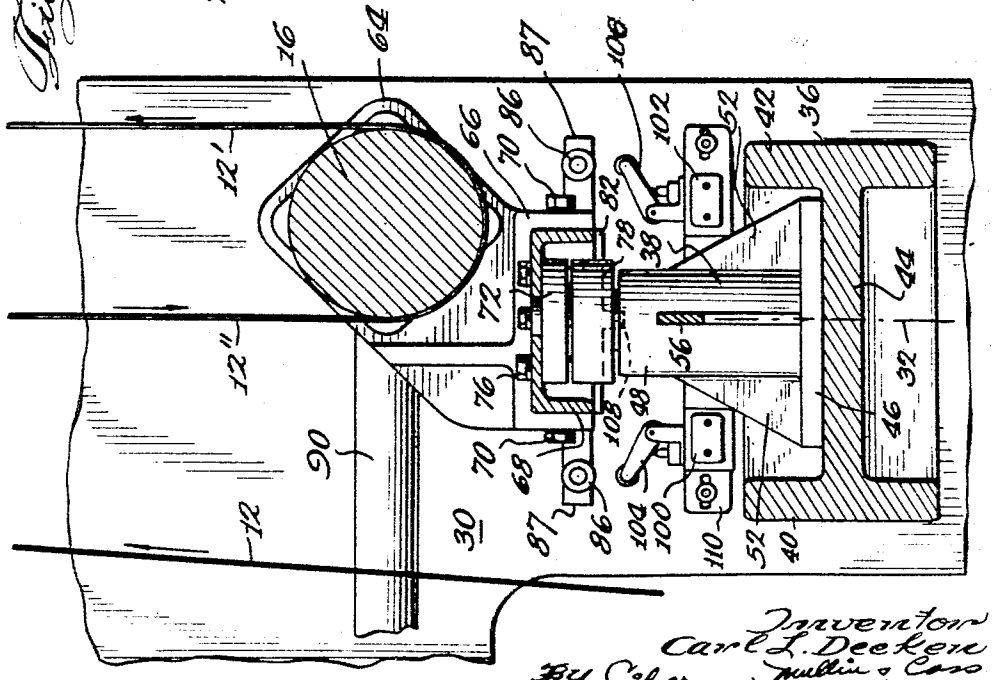


Fig. 5.



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2,940,752

STEERING ROLL CONSTRUCTION

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Filed Feb. 27, 1958, Ser. No. 718,057

12 Claims. (Cl. 271—2.6)

This invention relates generally to apparatus for controlling the lateral position of a moving web, such as, for example, a web of paper passing through a high-speed, multi-color printing press, and more particularly is concerned with a novel steering roll for use with such apparatus.

In a co-pending application Serial No. 801,503 filed March 24, 1959, in the names of Joseph C. Frommer and Ulrich R. Furst and entitled "Web Guide Control" and assigned to the same assignee as the assignee of this application, there is described a system for maintaining the web of paper of a high-speed printing press properly aligned with respect to the center line thereof for the purpose of maintaining lateral registration or even for the purpose of assuring that the web passes through the press in the exact geometric center of the press, as required, for example, when the web passes into the folder and into other parts of the machine. In this system, as explained therein, there is required a steering roll which is an idler roll over which the web of paper passes in the course of its travel, but which is mounted for pivotal movement. The amount of pivotal movement of the roll is controlled by a suitable detecting system and applied through a novel hydraulic arrangement.

It is of importance to the system as described in said co-pending application that the pivotal axis of the steering roll be offset from the axis of rotation of the roll so that the pivotal axis is aligned with the intersection of the plane of the web approaching the roll with the roll. This will be explained in some detail hereinafter, but the mounting of the roll for these requirements has given rise to several important problems which it is one of the principal objects of this invention to solve.

These problems include the following:

(1) It is necessary to provide a sturdy, simple and easily constructed mounting for the roll which will provide the offset pivotal action.

(2) The entire roll and mounting must be arranged for facile movement using a minimum of power, and since these rolls and their mountings are quite heavy and have great inertia, the solution for this problem was not readily obtained.

(3) The structure must be readily accessible for adjustment and service and replacement or change, if necessary.

(4) Since the position of the roll is so critical of satisfactory web centering, the structure must be capable of movement in its pivotal path with absolutely no wobbling, vibration, or other extraneous movement.

It will be seen hereinafter that the invention has many objects concerned with the solution of these problems in several different manners.

Many presses are required to handle different widths of paper web for different requirements. Thus a press may have maximum width of web passing through the machine for one job and then may have a job which requires half or a third or other fraction of the maximum width. Under these circumstances, it is not practical or

usual for the narrower web to be positioned in the geometric center of the press, but the same will be positioned off center. Obviously, for a fraction of web which passes through the press off-center, the center of rotation of the steering roll must be changed so that it is aligned with the desired center of the web. It is important under these circumstances to have the web guided because of the available lateral movement of the web, if not properly controlled.

This invention has as an important object the provision of a structure which, besides giving all of the benefits and advantages which attach by virtue of the solution of the above problems for a structure which has a permanent central pivot, will enable the structure to be easily and readily adapted for use with fractional webs, this being accomplished through a novel pivot structure. Means are provided for coupling the roll support with any one of a plurality of pivotal means provided at different positions transverse of the press so that the apparatus may be predisposed for different widths of web.

Many other objects will occur to those skilled in this art as the invention proceeds, especially in connection with collateral advantages achieved through the provision of a steering roll which is fully capable of responding to very fine adjustments, an attribute never possible with prior structures. In order to comply with the patent laws relating to descriptions of this type, there have been set forth in some considerable detail hereinafter, the construction and operation of preferred embodiments of the invention from an examination of which, in connection with the appended drawings, the invention will be completely understood and appreciated.

Prior to entering upon the specific details which are shown on the drawings, it would be well to point out that, as usual, the basic invention is capable of considerable variation in the sizes, proportions, arrangement of parts and the like without in any way departing from the spirit or scope of the invention. In this case, however, this must be emphasized even more than usual. The invention contemplates that the steering roll will not only be installed in new equipment, but will be incorporated into existing presses of different sizes, types and constructions. As such, the web will engage the steering rolls in different aspects, the frames will be different, the drives will be different, etc. Consequently, while the basic structure may be the same in substantially all presses, each will have certain requirements which are dictated by the differences between presses which must be incorporated therein. None of the variations required to adapt the structure of the invention to a particular press are to be considered as limiting the invention. The relative terms "top," "bottom," and the like are also not to be considered limiting, but only for assisting in an understanding of the drawings. One example of changes which may be required between presses is in the arrangement of the pivotal axis. While for the most part this axis is disposed vertically, it is not without the purview of the invention to provide such an axis horizontally, or even at an angle. The changes required to achieve this disposition are minor, and the resulting structure is still contemplated by the invention.

In the drawings, in which the same characters of reference are used throughout the several figures to designate elements which are the same or equivalent:

Fig. 1 is a side elevational view of a steering roll installation on a press embodying the invention, only a half of the structure being shown, since the other half is substantially identical.

Fig. 2 is a top plan view of the installation of Fig. 1 taken generally as a section along the plane 2—2 of Fig. 1 and looking in the indicated direction.

Fig. 3 is a detailed fragmentary side elevational view

of one end of a steering roll construction of somewhat modified form.

Fig. 4 is a top plan view of the installation of Fig. 3 taken generally as a section along the plane 2—2 of Fig. 3 and looking in the indicated direction.

Fig. 5 is an enlarged sectional view taken generally along the line 5—5 of Fig. 1 and in the indicated direction, the principal structure illustrated being applicable as well to the modified form of Figs. 3 and 4 as well.

Fig. 6 is a sectional view through one of the pivots of the structure, showing a typical arrangement to enable ready change of pivotal axis.

Fig. 7 is a diagrammatic view of the unwinding end of a printing press where the steering roll is preferably located, showing how the web is guided about the steering roll.

In Fig. 7 there is illustrated a diagram showing the unwinding end of a printing press or the like which has a steering roll of the construction of this invention associated therewith. A mill roll **10** is suitably mounted on a stand (not shown) which enables the paper to be unwound therefrom in a continuous web **12**. The mill roll stand may be mounted for shifting movement, which is an expedient well known in the industry, for compensating for excessive sway or runout of the paper along the length of the mill roll. Previously, electrical means for shifting the mill roll have been used but with the use of an offset steering roll, this has been alleviated. The system using the steering roll structure does not completely eliminate the slow-acting mill roll shifter, but provides means for shifting the mill roll whenever the amount of runout or sway is so great that a substantial correction is needed.

The web **12** passes from the mill roll **10** to an idler roller **14**, over this roller and downward to the steering roll **16**, makes a turn of approximately 180° about the steering roll, passing upward to another roller **18** and thence further into the press. The steering roll **16** rotates upon a transverse axis journalled at **20**, this axis being substantially parallel with the axes of the other rollers **14** and **18** and the mill roll **10**, although capable of being slightly canted relative thereto. For this purpose the journal means **20** is supported by arms **22** which in turn are mounted to a framework or support **24** which is pivotally mounted to enable the entire roll to be pivotally swung about a vertical axis in the center of the web **12**. The vertical axis is designated **26** and it is in the plane of the web as it meets the steering roll **16** tangentially, therefore being substantially at a right angle to the axis of rotation of the steering roll **16** and the other rollers. This right angle represents the approximately middle condition of swinging of the steering roll and must vary from perfectly normal on opposite sides thereof to enable adjustment of the position of the web as it passes the steering roll.

From geometrical considerations, the offset pivoting of the mounting for the steering roll provides a substantially greater transverse shifting of the off-going web **12'** than the on-coming web **12''** for a given degree of a pivotal movement of the support **24**. Because of this, the lateral position of the web between the mill roll **10** and the steering roll **16** is substantially constant, notwithstanding great variation in the lateral position of the web from the steering roll **16** onward.

In Figs. 1 and 2 there is illustrated the supporting framework **30** of a large printing press or the like with which the steering roll **16** is associated. Looking at Fig. 2, the on-coming web **12''** shown in section lies on the axis **32** about which the entire supporting structure **34** which mounts the roll **16** is pivotal. The off-going web **12'** is spaced from the pivotal axis **32** by the diameter of the roll **16** itself. Obviously for small rotational movement of the supporting structure **34** about the pivotal axis the lateral movement of the off-going web **12'** will be substantially greater than the lateral movement of the on-coming web **12''**.

A relatively rigid support beam **36** of H-shaped configuration is secured to the supporting framework **30** transverse of the web **12** beneath the roller **16** and offset from the position that the roller is to assume. A pivot assembly **38** is secured thereto between the vertically disposed parallel arms **40** and **42** (Fig. 5 and 6) overlying the connecting web **44**. The pivot assembly is formed of a flat rectangular plate **46** having a plurality of vertically arranged bearing housings secured along the length thereof, three of such housings being illustrated in Fig. 1 at **48, 49** and **50**. Obviously, there may be as many bearing housings as pivotal points are desired, since each housing is capable of supporting means for pivoting the steering roll. These bearing housings are constructed in a manner which will be described hereinafter, as will be explained in detail in connection with Figs. 5 and 6. The bearing housing **48** will be assumed to be positioned in the approximate transverse center of the beam **36**.

The support **36** has suitable bracing members such as **52, 54** and **56** assuring the rigidity of the assembly **38**, these members extending between the housings and the plate **46** and between one another, and being welded in place. The housings themselves are preferably welded to the plate **46**, as will be explained.

The steering roll **16** has reduced diameter necks **58** (Figs. 3 and 4) at opposite ends thereof which are finished as usual in structures of this kind of form a journal surface (not shown) which is mounted in a bearing **60** of any suitable construction. The bearings **60** are secured through the medium of bolts **62** or other fastening means to offset brackets **64**. Each bracket is integral with a channel-like base **66** which is clamped to the end of a horizontally arranged, inverted, channel-shaped member **68** which extends substantially parallel with the beam **36** spaced above the same. Bolts **70** secure the base **66** to the end of the channel-shaped member **68**. This channel-shaped member **68** may be termed the pivot channel since each of the bearing housings **48, 49** and **50** has a corresponding pivot block such as **72, 73** and **74** secured to the bottom of the pivot channel by suitable bolts such as **76**. The pivot blocks are each perfectly aligned with a particular bearing housing in order that when coupled together, a pivot block and housing will support the entire structure **34** thereon for pivotal movement. In Figs. 1 and 2 it will be noted that the pivot block **72** and the bearing housing **48** cooperate through the medium of a split clamping ring **78**, the other pivoting means being separated so that the only active pivot means is that on the axis designated **32**.

As thus far explained, the steering roll supporting structure **34** is mounted for pivotal movement on the axis **32** which is offset from the axis of the roll **16** itself and arranged at substantially right angle relative thereto.

The explanation which preceded this detailed description mentioned that the movement of the steering roll **16** and its supporting structure must be accomplished without wobbling, vibration or the like. In order to confine and guide the movement of the supporting structure **34**, the pivot channel **68** has an extension **80** (Fig. 1) provided on opposite ends thereof which may either be secured thereto or be integral therewith, comprising a relatively flat portion achieved by milling the side arms of the channel from the structure. To the bottom of this extension **80** there is secured a horizontally arranged U-shaped member **82** which has its opposite arms horizontal to define therebetween a track or slot **84**. The supporting framework **30**, which may take any form, as previously stated, may comprise a standard or the like which has a series of horizontally spaced apart rollers **86** secured thereto upon a suitable bracket or mounting strip **87** secured to said framework. There are two such groups of rollers on opposite sides of the apparatus, and said rollers **86** engage between the horizontal arms of

the member 82 in the slot 84 thereof to confine and guide the pivotal movement of the steering roll supporting structure 34 thereby.

The movement required of the structure 34 is imparted thereto by means not fully illustrated herein but described in said copending application, and including a hydraulic actuator 90, the connecting rod 92 of which is pivotally secured at 94 between a pair of ears 96 welded to the plate 98 mounted to the back of the bracket 64. Any other suitable means for attaching the hydraulic actuator 90 obviously may be utilized.

The structure thus far described is capable of being used to control the position of the web laterally with respect to the printing press rollers without unduly causing wrinkles and the like in the web. The amount of movement which can be accomplished laterally may be as much as two inches, depending upon the diameter of the steering roll, but such movement is capable of controlling and maintaining the position of the web within less than a thirty second of an inch. Where the movement required to correct the web is greater than the practical extent of movement of the supporting structure 34, say where the maximum web movement is two inches, and the error measured and required is greater, the mill roll 10 may be shifted through the use of limit switches 100 and 102 closed by the cams 104 and 106 respectively, depending upon the direction of movement of the supporting structure 34 (Fig. 5). These cams are moved by the projection 108 which depends from the center of the U-shaped member 82. The switches 100 and 102 and their actuating cams 104 and 106 are supported on a mounting strip 110 adjustably mounted on the standard 30.

The supporting and guiding roller and track structure described in connection with Figs. 1 and 2 may be replaced by an arrangement which has even less vertical movement at the ends of the supporting structure 34. In the construction in which the rollers are carried by the standard 30 and the track is carried by the swinging structure 34, there must be vertical clearance between the track 84 and the rollers 86 because obviously the top and bottom peripheries of the rollers rotate in opposite directions while the top and bottom of the track move in the same direction simultaneously. Furthermore, the movement of the ends of the supporting structure 34 is actually arcuate, about the pivotal axis 32, and there will be some frictional slip between the rollers and the track unless the rollers are arranged along the arcuate line of travel of the track. This can be accomplished, but it is preferable to use the arrangement shown in Figs. 3 and 4.

In Figs. 3 and 4 the general constructional details of the apparatus are the same as in the case of Figs. 1 and 2. The only difference lies in the confining and guiding means. There are illustrated a steering roll 16 having the neck ends as at 58 journalled in the bearings 60. One end of the structure is shown, but the opposite end is substantially the same. The bolts 62 mount the bearing 60 on the bracket 64 which is integral with the channel base 66 clamped to the end of the pivot channel 68 by the bolts 70. The on-coming web 12'' and the off-going web 12' are illustrated.

At the left hand end of the structure 34 and secured to the outside surface of the bracket 64 there are two blocks, an upper block 120 and a lower block 122, each being secured by bolts 124 or other securing means. Each block is elongate in formation, having a flat side engaged against the adjacent surface of the bracket 64 and having extensions 126 and 128 at the ends thereof, both of the blocks 120 and 122 being substantially alike, the plan view of the block 120 only being visible in the figures. The extensions 126 and 128 have rollers 130 and 132 mounted therein, for free rotation. The rollers 130 have their axes generally parallel with the axis of the roll 16 since in the structure illustrated particularly, the axes of said rollers 130 lie substantially in the plane of the on-coming web 12'' and hence, if extended, would intersect the vertical axis of pivoting of the structure 34. The rollers 132 on the other hand are arranged with their axes at an angle to the axes of the rollers 130.

The axes of the rollers 132 if extended will also preferably intersect the vertical pivotal axis of the structure 34, and hence, the rollers 130 and 134 define the arc of movement of a point on the end of the structure 34. Even where the center pivot of the structure 34 has been changed, the arcuate alignment of the rollers 130 and 132 is advantageous to provide less than the frictional resistance which would be occasioned by rollers which had their axes substantially parallel.

The hydraulic actuator 90 may have its connecting rod 92 pivoted at 94 to another extension 136 integral with each of the blocks 120 and 122.

The standard 30 of Figs. 3 and 4 is provided with a horizontal support member 140 to which there is secured by suitable bolts 142 a plate 144 arranged in a horizontal plane of such thickness and disposition as to be confiningly and accurately sandwiched between the upper and lower rollers 130 and 132 to provide roller bearing surfaces for the rotation of said rollers. In order to conform to the movement of the structure 34 during its pivotal swinging the free edge 146 of the plate 144 is provided with a contour which is arcuate and which is defined substantially by a radius centered at the pivotal axis of the center of the structure 34. Thus, the arcuate edge 146 is substantially parallel with the arc defined by the rollers 130 and 132. In this manner the rollers can engage the very edge of the plate 144 and the distance between opposite supports 30 can be decreased from that which would be required in the case of structures like that of Figs. 1 and 2.

The arrangement of Figs. 3 and 4 has the minimum of vertical movement at the ends of the structure 34 because the rollers 130 and 132 can be firmly engaged against the top and bottom of the plate 144, will not generate any friction, and follow as closely as practical the path of movement of the end of the structure 34.

The limit switches described in Figs. 1 and 2 may also be provided in the construction of Figs. 3 and 4. There is illustrated a projection 150 secured to the back of the bracket 64 which cooperates with cams such as illustrated at 152 for operating limit switches such as 154.

A construction of steering roll which mounts a single pivot means providing a pivotal connection between the center of the pivot channel 68 and the support beam 36 will suffice to give many of the advantages of the invention and enable fully satisfactory web guiding and centering to be achieved. As pointed out, however, such a construction will be useful only if the web 12 is always to be positioned in the center of the roll 16 and the other rotating rolls of the press. This being impractical in many presses, the invention has provided the novel expedient of enabling the steering roll to be altered to change its vertical axis of pivoting.

The structures of Figs. 1 and 2 are pivoted in the center of the apparatus on the vertical axis 32 but can easily be altered to pivot on the vertical axis 32' or 32''. Other pivotal axes on the opposite side of the center axis 32 may be provided, as well. As explained, there are a plurality of bearing housings such as 48, 49 and 50 secured to the pivot assembly 38, all of them being substantially identical. The housing 48 and its structure now will be described in detail.

The housing 48 is in the form of a tubular cylindrical body which has a reduced diameter portion 160 closely fitted into a circular socket-like opening formed in the plate 46 and welded thereto at the points 162 and 164, these being respectively at the bottom end of portion 160 and at the engagement of the annular shoulder formed by the reduction in diameter with the upper surface of the plate 46. On its interior, the housing has an upper thrust ball bearing 166 engaged upon a shoulder 168 formed for

this purpose by machining the interior 170 of the upper end of the housing 48 with a larger diameter than the housing body between the ends thereof. A snap ring 172 seated in a suitable groove keeps the upper thrust bearing 166 in position. The inner ball race 174 has the upper end of a pivot shaft 176 supported therefrom, the lower end being disposed within a second ball bearing 178 which, in turn, is telescoped within an enlarged core portion 180 which opens to the bottom of the housing 48. The bearings 166 and 178 are retained in spaced relation by a sleeve 184 which engages the shaft 176. The bearing 178 is held upon the shaft by a snap ring 186 in a suitable groove.

The upper end of the shaft 176 has an integral head 190 provided thereon which extends out of the upper end of the housing 48, being of frusto-conical configuration, flaring outwardly and upwardly, the head being connected to the shaft by a neck portion 192 which provides a shoulder engaging over the inner race 174.

The pivot channel 68 has a plurality of pivot blocks each of which is aligned with a bearing housing and all being constructed alike. Thus, only the block 72 will be described. This block has a depending frusto-conical extension 196 which is of substantially the same configuration as the head 190 but of opposite disposition.

In conjoining the pivot block 72 with the pivot shaft 176, the facing formations 190 and 196 are engaged by a clamping ring 78. The clamping ring 78 is split into two parts held together by suitable machine screws such as shown at 198 but may be considered as a unitary element for descriptive purposes. The ring 78 has undercut annular recesses 200 and 202 in its upper and lower surfaces respectively, these recesses being of dimensions and configuration as to matingly receive therein the respective formations 196 and 190 respectively. Obviously, the halves of the ring must be separated in order to permit the said halves to be slid into engagement with the formations after which the screws 198 are driven home to hold the entire assemblage together. The recesses 200 and 202 may be slightly countersunk on their respective bottom surfaces to provide ease of assembly and to concentrate the holding pressure around the circumference of formations 190 and 196.

Since each of the bearing housings has a structure identical with that of housing 48, including the shaft and bearings, while each of the pivot blocks is identical to the block 72, if it is desired to change the pivot axis 32 to any other location, such as the axis 32' or 32'', all that need be done is to remove the split ring 78 from the block 72 and head 190 and re-install the same upon any other pair of juxtaposed frusto-conical formations.

It has been stated that many variations are possible within the scope of the invention and which are unnecessary to enumerate at this point. It is desired to point out however, that various means for adjusting the positions of the various components may be made. For example, the positions of rollers, tracks, switches, cams, and the like can be adjusted by well-known means. The alignment of the housings 48, 49, 50 etc. may be adjusted by means such as shown in Fig. 1 at 204 which may be varied in conjunction with the fastening means 206 which hold the plate 46 in position.

In the claims the structure 34 is sometimes designated generally as a yoke assemblage.

What it is desired to secure by Letters Patent is:

1. A steering roll construction for use with a machine that has a flexible web passing therethrough to be operated upon by the machine, and comprising, a base including a pair of spaced apart framing members fixed to said machine, a single steering roll means adapted to have the web pass at least partially around the same and engaging a substantial portion of the surface thereof with swivelling of the roll means serving laterally to shift the web upon leaving the roll means without any lateral shift of the web prior to entering the roll means, an elongate yoke assemblage having said roll means journalled thereon on a substantially horizontal axis, a pivotal structure between the ends of said yoke assemblage making a pivotal connection with said base on a swivel axis arranged at right angle to said horizontal axis and spaced therefrom in the direction of the arriving web by substantially the radius of said roll means, the swivelling movement of said yoke serving to move said horizontal axis in a plane perpendicular to said swivel axis, there being an anti-friction connection between each of said framing members and the adjacent end of the yoke assemblage, each of said antifriction connections comprising a plate having a flat bearing surface and a plurality of co-acting anti-friction rollers engaging the flat bearing surface of said plate, the plane of said surfaces of both anti-friction connections being at least closely adjacent to and parallel with the plane of swiveling of said horizontal axis.

2. A steering roll construction as claimed in claim 1 in which each connection includes two groups of rollers, the axes of each group lying in a plane which is parallel with the plane of the other group and with the said swivelling plane of said horizontal axis, and in which the said plate has a second flat bearing surface opposite said first-mentioned flat bearing surface, the plate being sandwiched between the groups of rollers so that each group engages opposite surfaces thereof to support and guide said yoke assemblage in its swivelling movement.

3. A steering roll construction as claimed in claim 1 in which the said plate has said flat bearing surface immediately adjacent an arcuate edge thereof the curvature of which is substantially in conformation with the path of movement taken by said rollers during swivelling of said yoke assemblage.

4. A steering roll construction for use with a printing press having a paper web passing therethrough to be printed by the press, and comprising a fixed base having a framework including a pair of uprights between which the steering roll is disposed for guiding the web and controlling the lateral position of the web as it passes through the press, a single steering roll means having the web passing around the same in a turn of approximately 180° and having an oncoming reach and an outgoing reach, an elongate yoke assemblage having said roll means journalled thereon for rotation on a substantially horizontal axis, a pivotal structure coupling the yoke to the base for swivelling movement on a swivel axis which is perpendicular to said horizontal axis and lies approximately in the plane of the oncoming reach of said web whereby to shift the outgoing reach without shifting the incoming reach as the roll means is swivelled, and is spaced from said horizontal axis, a pair of guide members secured respectively to the uprights and extending toward one another, each guide member having a flat bearing surface in a common plane which is perpendicular to said swivel axis, the ends of the yoke assemblage having anti-friction rollers engaged upon the respective bearing surfaces to confine and guide the yoke assemblage in its swivelling movement and limit strain on said pivotal structure.

5. A construction as claimed in claim 4 in which each yoke assemblage end has at least a pair of said anti-friction rollers spaced apart and disposed on opposite sides of the said horizontal axis.

6. A steering roll construction which comprises, a fixed base, a steering roll, an elongate assemblage having said roll journalled thereon for rotation on a horizontal axis, the assemblage adapted to be pivotally mounted upon said base to pivot thereon on a vertical axis spaced from said horizontal axis, said base and assemblage having a plurality of cooperative pivot means each formed of two parts with one of said two parts provided on said assemblage and the other of said two parts provided on said base.

and with the said two parts adapted to be vertically aligned, the pivot means being spaced apart and each defining a vertical pivot axis which is spaced from said horizontal axis, and removable means for coupling the two parts of any pivot means together while leaving the parts of the remaining pivot means disconnected.

7. In a steering roll construction in which an elongate steering roll mounting is adapted to bodily swivel about a vertical pivot axis provided on a base and spaced from the horizontal axis of said steering roll; means for changing the swivel axis which comprises, a plurality of swivel parts of one kind spaced along said base, a plurality of swivel parts of a second kind spaced along said mounting and having identically aligned positions as the parts of said one kind along said base, each pair of aligned parts being normally independent of one another but adapted when coupled together to form together a pivot assemblage whose swivel axis is vertical and spaced from said horizontal axis, and removable coupling means engaged upon one pair of said aligned parts.

8. A structure as claimed in claim 7 in which each part of an aligned pair has a juxtaposed necked head spaced apart, and said coupling means comprises a split ring provided with recesses engaging behind said heads and clamped thereto.

9. A steering roll construction which comprises, a fixed base, a steering roll, an elongate yoke assemblage having said roll journalled thereon for rotation on a horizontal axis, the yoke assemblage adapted to be pivotally mounted upon said base to pivot thereon on an axis perpendicular to and spaced from said horizontal axis, said base and yoke assemblage each having cooperative means along the lengths thereof respectively providing for pivotal connection of said base and assemblage at any one of a plurality of different locations along said lengths whereby to enable the effective vertical pivotal axis of said steering roll to be adjusted to and maintained at any one of said different locations.

10. A steering roll construction as claimed in claim 9 in which said cooperative means of said yoke assemblage is located on said assemblage on a line parallel with the horizontal axis of said steering roll.

11. A construction for steering a flexible web through a machine and adaptable for steering the web on different centers which comprises, a base, a steering roll support adapted to be pivotally connected with said base on a first axis, a steering roll having said web passing around the same for a substantial portion of the circumference thereof, and said roll being journalled for rotation on said support on a horizontal axis with said first axis being normal to and spaced from said horizontal axis by approximately the radius of said roll, said support and base respectively having cooperative pivot means providing said pivotal connection, said respective pivot means being releasable from one another and said support and base having means along the lengths thereof enabling said respective pivot means to be resecured to one another at any one of a plurality of different positions on a line parallel with said horizontal axis to provide a pivotal connection thereat whereby to enable positioning of said first axis for passage of a web over said roll with the web center not necessarily coincident with the geometric center between ends of said roll.

12. A steering roll construction which comprises, a fixed base, a steering roll, an elongate yoke assemblage having said roll journalled thereon for rotation on a horizontal axis, the assemblage adapted to be pivotally mounted upon said base to pivot thereon on a second axis which is perpendicular to said horizontal axis but substantially spaced therefrom, said base and assemblage having cooperative pivot means each with a portion provided respectively on each of said base and assemblage, the portions adapted to be vertically aligned and coupled together at any one of a plurality of different positions along the length of said assemblage to provide any one of a plurality of different locations for said second axis along a line parallel with said horizontal axis.

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