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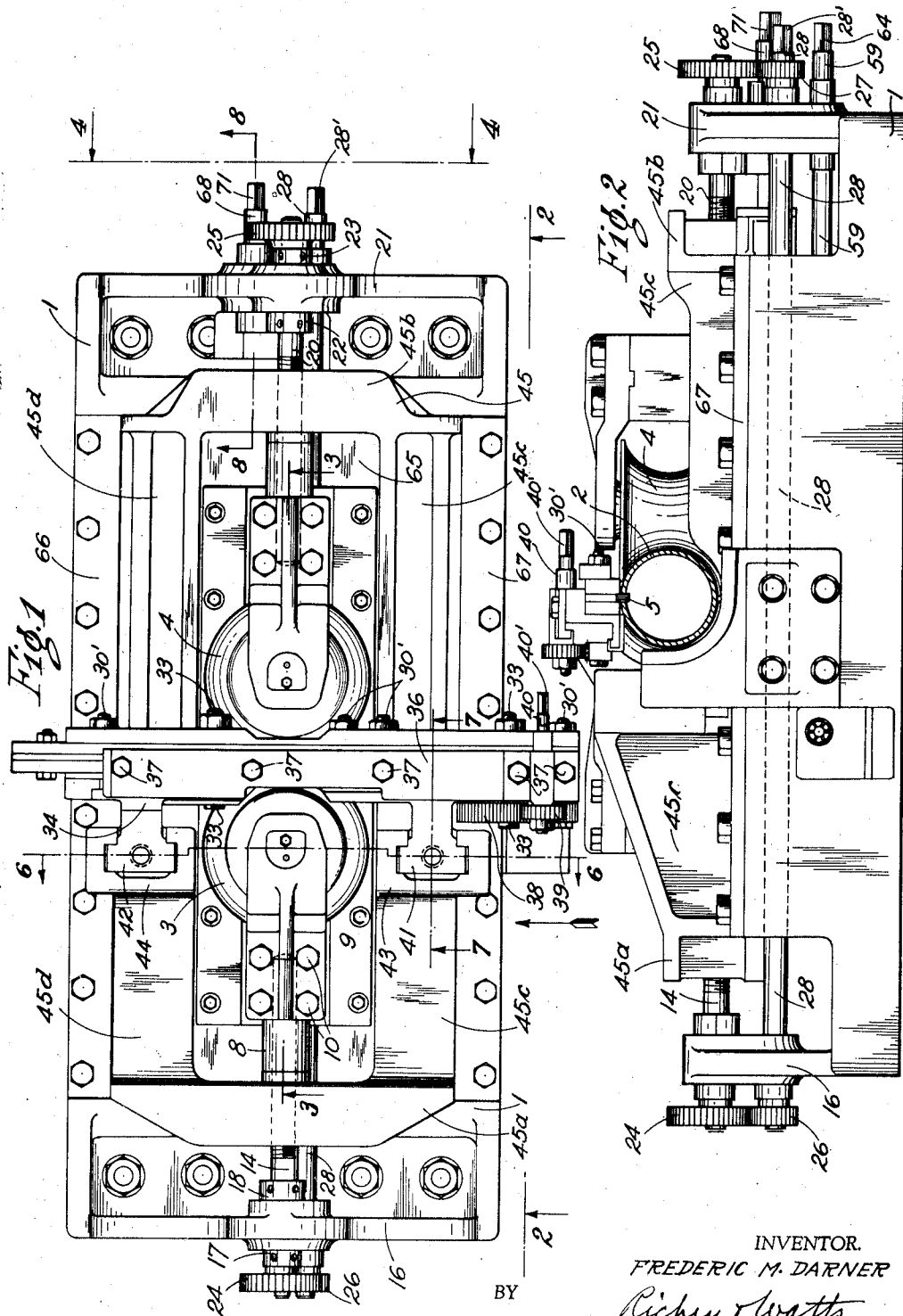
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2,196,106

SEAM GUIDE

Filed Jan. 13, 1939

3 Sheets-Sheet 1



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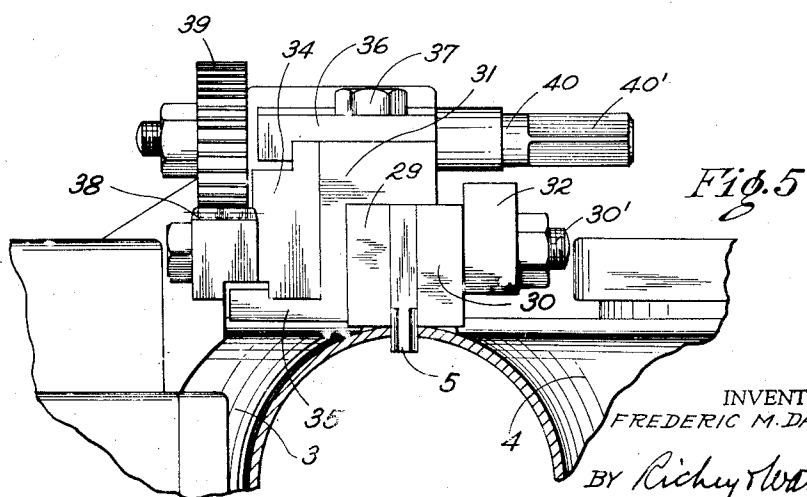
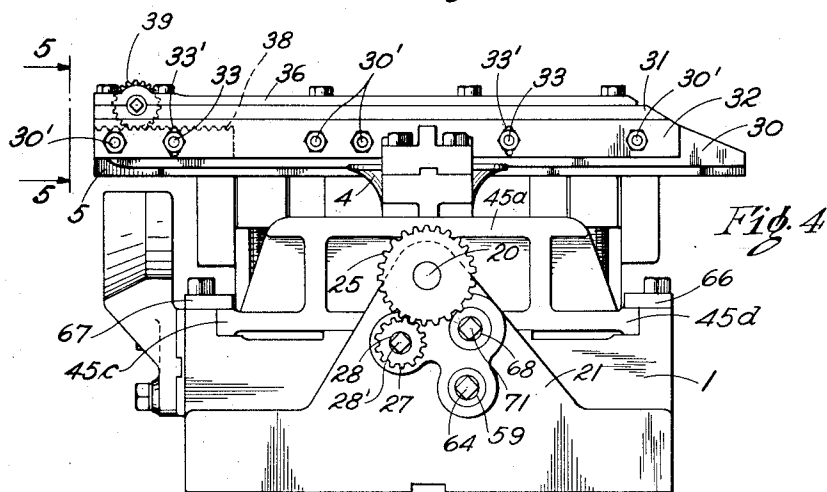
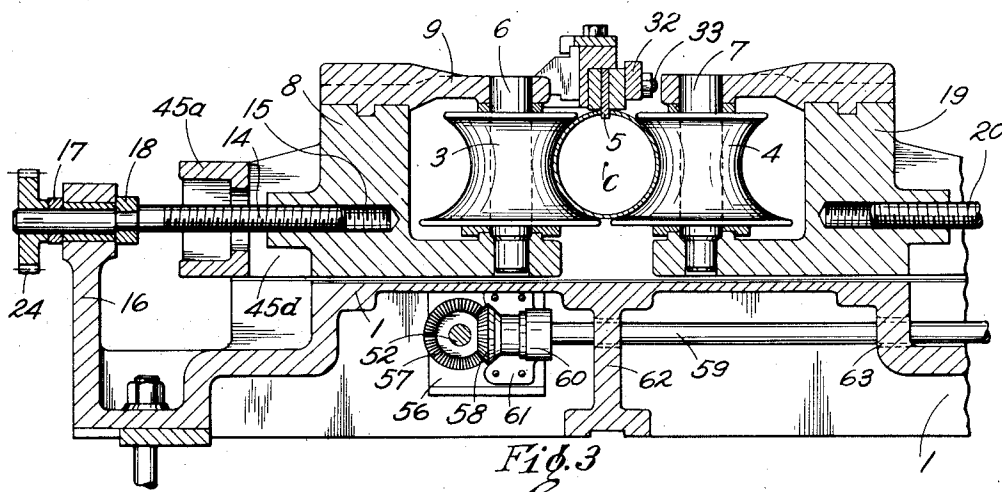
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3 Sheets-Sheet 2



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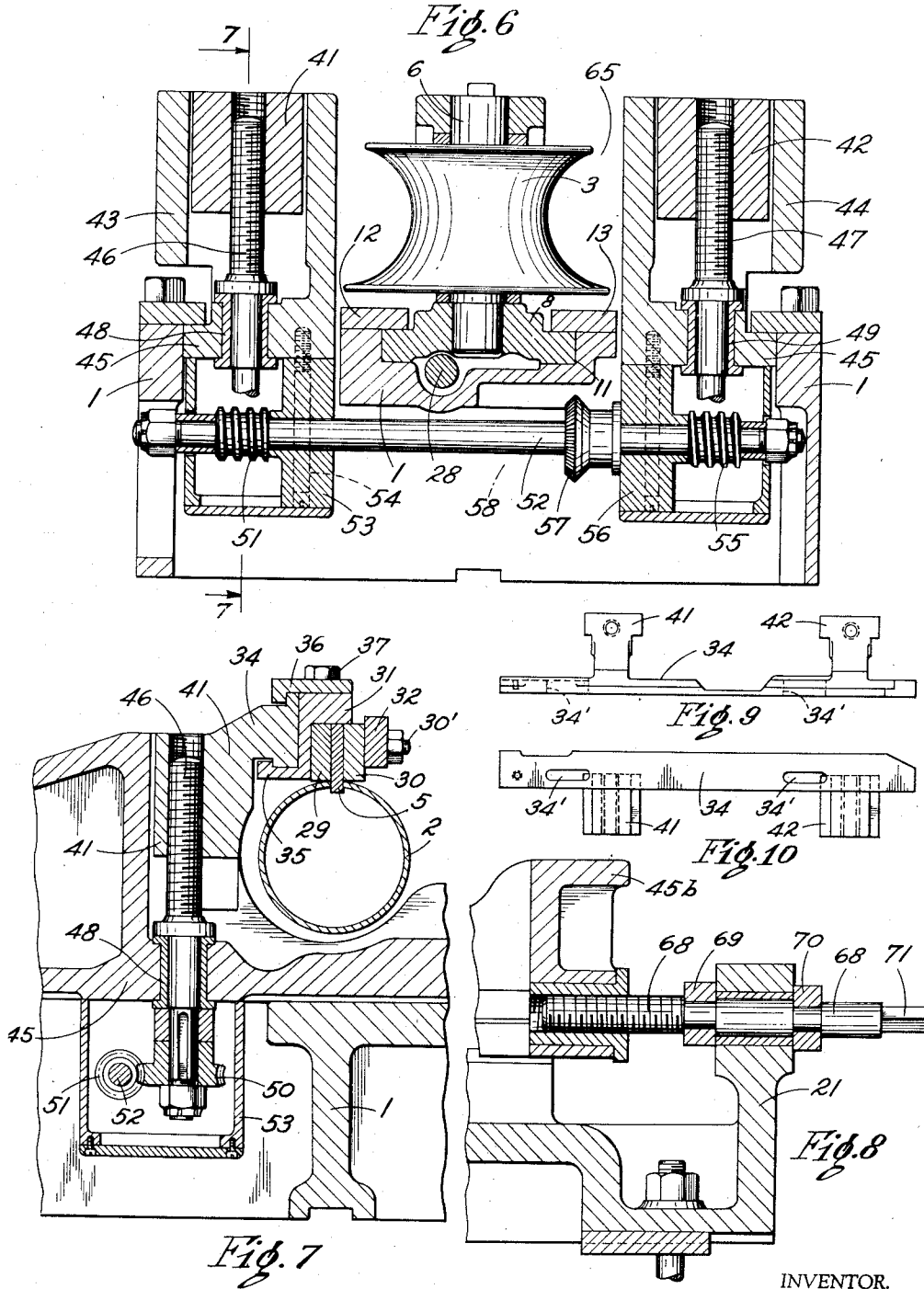
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3 Sheets-Sheet 3



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SEAM GUIDE

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Application January 13, 1939, Serial No. 250,801

5 Claims. (Cl. 219-6)

This invention relates to tube or pipe welding machinery and more particularly to an improved seam guide for positioning the open seam of the unwelded tube just prior to its entry into the welding section of an electric welding machine.

Seam guide devices have been proposed and used in this art which comprise an elongated blade or fin which extends into the open seam of the unwelded tube and it is among the objects of my invention to provide a fin or blade type seam guide and mounting therefor whereby the guide will accurately and positively position the seam. Other objects of my invention are the provision of a seam guide which is readily adaptable to various sizes of tube; the provision of a seam guide which may be easily adjusted to shift the position of the seam during operation of the welder; the provision of seam guide mechanism having easily operated controls whereby a plurality of different movements may be imparted to the tube and the seam guide blade while the tube is either moving or stationary.

The above and other objects of my invention will appear from the following description of a preferred embodiment thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of my seam guide mechanism.

Figure 2 is an end elevation taken substantially on line 2-2 of Figure 1.

Figure 3 is a vertical cross-sectional view through the center of the tube supporting and guiding rolls, taken on line 3-3 of Figure 1.

Figure 4 is a side elevation of the operating side of the device taken on line 4-4 of Figure 1.

Figure 5 is an enlarged fragmentary end view of the blade holding mechanism taken on line 5-5 of Figure 4.

Figure 6 is a vertical cross-sectional view showing the vertical adjusting means for the seam guide blade taken on line 6-6 of Figure 1.

Figure 7 is a vertical cross-sectional view taken on line 7-7 of Figures 1 and 6.

Figure 8 is a vertical cross-sectional view taken on line 8-8 of Figure 1.

Figure 9 is a detached plan view of the vertically adjustable slide support for the seam guide blade.

Figure 10 is a side elevation of Figure 9.

The base or frame 1 is stationary and may be supported in any suitable manner (not shown) preferably just ahead of the welding section of an electrical tube or pipe welding machine. The tube, which comes to the seam guide from the forming section, is shown at 2 in Figure 2. Rolls

3 and 4, having vertical axes, engage the tube and prevent it from moving laterally or vertically as it passes through the seam guide device. The seam guide proper comprises an elongated blade or fin 5 which extends down into the open seam of the tube 2. As is indicated in Figures 4 and 5, this blade 5 is preferably tapered at both its entering and exit ends and may, of course, vary in thickness depending upon the size of the tubing being handled.

In order to provide a seam guide which will meet all of the conditions encountered in operation I have provided a number of different adjustments for the rolls 3 and 4 and the blade 5. The operation of my seam guide can probably best be understood by describing each of these adjustment mechanisms separately, although it will be observed that all of the adjustment mechanisms cooperate to provide a structure which will fulfill the varying conditions met in the operation of tube welding machines.

Referring particularly to Figures 1 and 3, the rolls 3 and 4 are mounted on vertical shafts 6 and 7 respectively. The shaft 6 is journaled at its lower end in a sliding roll supporting bracket 8 and at its upper end in a projecting cap 9 which is secured to the bracket 8 as by screws 10. As is seen in Figure 6 the bracket 8 is supported in a slideway 11 in the main base or frame 1, suitable plates or straps 12 and 13 being employed to hold the bracket in position and complete the track therefor. A feed screw 14 engages a threaded aperture 15 in the bracket 8 and extends through the upwardly extending end flange 16 of the base 1. Collars 17 and 18 are secured to the feed screw 14 on either side of the flange 16 and prevent axial movement of the screw 14 relative to the base 1. The screw 14 does not have threaded engagement with the flange 16.

It will be seen from the above description that when the screw 14 is rotated the bracket 8, together with the roll 3 supported thereby, will be moved toward or away from the normal center line C of the tube. The roll 4 is supported in an exactly similar manner on a sliding bracket 19 which is engaged by a feed screw 20, of opposite hand from the feed screw 14. This feed screw 20, as is seen in Figures 1 and 4, extends through an upwardly extending flange 21 on the opposite end of the base 1 from the flange 16. Collars 22 and 23 are secured to the screw 20 on opposite sides of the flange 21 and prevent axial movement of the shaft 20 in the same manner that the collars 17 and 18 prevent axial movement of the screw 14.

When the screws 14 and 20 are rotated in the same direction the brackets 8 and 10, together with the rolls 3 and 4, will be moved toward or away from each other. In order to so rotate the screws 16 and 20 I have mounted a gear 24 on the end of the screw 16 and a gear 25 on the end of the screw 20. These gears are engaged by gears 26 and 27 which are mounted on and secured to a shaft 28 (see Fig. 2) having a squared end 28' to accommodate a wrench or the like. The shaft 28 passes through and has a bearing in the upwardly extending flange 21 and extends entirely across the base 1 and has another bearing in the bracket 16. By rotating the shaft 28 the rolls 3 and 4 and their supporting housings simultaneously are moved toward or away from each other and toward or away from the center line of the tube, the direction of movement depending upon the direction of rotation of the shaft 28.

Having described the roll supports and means for adjusting the rolls toward and away from each other, it will now be in order to describe the support for the seam guide blade 5 and the means for adjusting the blade independently of and relative to the rolls 3 and 4. As is best seen in Figures 4 and 5, the blade 5 is clamped between elongated gripping members 29 and 30 by bolts 30' and this assembly is secured to a longitudinally slidable blade support 31 by a clamping bar 32 and two suitable bolts 33 which extend through horizontally extending elongated slots 34' in the slide 34 (see Figs. 9 and 10). The blade support 31, with the blade 5, grippers 29 and 30 and clamp bar 32, is mounted on the vertically adjustable slide member 34 for slidable movement in a direction parallel to the tube axis. This arrangement is clearly seen in Figure 5, it being noted that the blade support 31 has a grooved leg 35 which engages a corresponding portion of the adjustable slide 34 and a removable top piece 36 which engages the upper edge of the member 34. The bolts 33 pass through vertical slots 33' in the clamp 32 whereby the angle of the blade can be adjusted to a certain degree. Screws 37 hold the top piece 36 in position.

In order to move the knife 5 and its support 31 longitudinally on the slideway member 34 I provide a rack 38 which is mounted on and secured to the stationary slideway member 34. A spur gear 39 engages the rack 38 and is secured to and rotatable with a shaft 40 carried by the blade supporting member 31. The cover plate 36 and the support 31 are bored to provide a bearing for the shaft 40. The end of shaft 40 is preferably squared as at 40' to accommodate an operating wrench and, when the shaft 40 is rotated, the gear 39 and the support 31, together with the blade 5, will be moved longitudinally relative to the rack 38 and the frame 1 of the machine in a direction parallel to the tube axis. When it is desired to operate the gear 39 and move the blade lengthwise the bolts 33 are released. This also permits the angle of blade 5 to be adjusted as the clamp 32 and blade assembly 5, 29 and 30 are provided with vertical slots 33' through which the bolts 33 pass. After the blade is placed in the desired adjusted position the bolts 33 are tightened to lock the blade supporting assembly in position.

The slideway support member 34 has a pair of downwardly extending legs 41 and 42 which have sliding fits in upwardly extending C-section channels 43 and 44. These channels are a part of the yoke member, generally indicated at 45,

which carries the entire blade supporting and adjusting mechanism.

Vertical feed screws 46 and 47 have threaded engagement with the downwardly extending legs 41 and 42 respectively, and are supported in bearings 48 and 49 in the yoke member 45. As seen in Figure 7, a worm gear 50 is keyed to the bottom end of the screw shaft 46 and engages a worm 51 on the transverse shaft 52. The gears 50 and 51 are enclosed in, and the shaft 52 is supported by, a box-like housing 53 which may be secured to the yoke 45 by screw 54. A worm gear (not shown in the drawings, but entirely similar to worm gear 50) is secured in similar manner to the lower end of the screw shaft 47. This worm gear engages a worm 55 carried by shaft 52 and the gear drive for the screw 47 is enclosed in a box 56 which is similar to the box 54.

It will be seen that when the shaft 52 is rotated the screws 46 and 47 will be turned, thus lifting or lowering the slide member 34 together with the seam guide blade assembly. Rotation of the shaft 52 is effected through a bevel gear 57 mounted on the shaft 52 which engages a bevel gear 58 carried on the end of a shaft 59. The bearing 50 for the inner end of shaft 50 is carried by a bracket 61 which is attached to the box 56. The shaft 59 passes freely through the webs 62 and 63 of the base 1, and, as is seen in Figure 2, has a sliding bearing adjacent its outer end in the upwardly extending flange 21. The outer end of the shaft 59 is preferably squared as seen at 64 to accommodate an operating wrench or handle.

The entire blade supporting and operating mechanism is mounted on and carried by the yoke 45 which has a central opening 65 (see Fig. 1) and which comprises end members 45^a and 45^b and sides 45^c and 45^d. The side rails 45^c and 45^d are slidably mounted upon the base 1, plates 66 and 67 being employed to complete the track or guideway in the frame 1. The entire yoke 45, together with the blade 5 and its supporting and operating mechanism, may be moved transversely of the tube path by means of the adjusting screw 68 which has threaded engagement in the end portion 45^b of the yoke 45 (see Fig. 3). The screw 68 has a bearing in the bracket 21 and is prevented from axial movement by collars 69 and 70. The squared end 71 of the operating screw 68 accommodates an operating wrench or handle in well known manner, and it will be observed that when the screw 68 is rotated the frame or yoke 45 will slide upon the base 1, moving transversely the blade 5 and its lifting and lowering mechanism. This adjustment can be effected while the tube is stationary or passing through the machine and serves to move the open seam of the tube toward one or the other of the guiding rolls 3 and 4.

As has been previously explained, the rolls 3 and 4 may be moved toward and away from each other on the frame 1 and the blade 5 may be vertically lifted or lowered in its support upon the yoke 45. Thus, if it is desired to accommodate tubes of different diameters, the roll shafts 6 and 7 may be spaced to accommodate rolls grooved for tubing of any desired size within the range of the machine. The blade 5 may be lifted to accommodate a larger tube or lowered to properly engage a smaller diameter tube and, in order to insure that the open seam of the tube is delivered to the welding section of the machine in the proper position, the blade 5 may be shifted

laterally, thus, in effect, twisting the tube relative to the supporting rolls 3 and 4. All of the adjustments noted are made by turning the three shafts 28, 38 and 58, the operating ends of which are conveniently grouped on the same side of the machine.

The rolls 3 and 4 may quickly and easily be changed by merely moving the brackets 6 and 10 apart, removing the cover plates which support the upper ends of the roll shafts 6 and 7, and lifting off the rolls. It is not necessary to remove or in any way disassemble the seam guide supporting mechanism to change rolls and the advantage of this feature of my invention will be readily appreciated.

Although I have described the illustrated embodiment of my invention in considerable detail, it will be understood by those skilled in the art that numerous variations and modifications may be made in the specific form of my improved seam guide apparatus and I do not, therefore, wish to be limited to the particular embodiment shown in the accompanying drawings, but claim all forms thereof coming within the scope of the appended claims.

I claim:

1. A seam guide of the type described comprising a base, a pair of roll supporting brackets mounted on said base for sliding movement toward and away from each other, rolls rotatably mounted on said brackets, means for simultaneously moving said brackets and rolls toward or away from each other, a yoke member slidably mounted on said base and having a central opening, said roll supporting brackets being disposed within said opening, means for moving said yoke on said base in a direction parallel to the movement of said roll brackets and independently of said roll brackets, a seam guide blade, and means carried by and movable with said yoke for supporting and vertically moving said blade.

2. A seam guide of the type described comprising a base, a pair of roll-supporting brackets mounted on said base for sliding movement toward and away from each other, rolls rotatably mounted on said brackets, means for simultaneously moving said brackets and rolls toward or away from each other, a yoke member slidably mounted on said base and having a central opening, said roll supporting brackets being disposed within said opening, means for moving said yoke on said base in a direction parallel to the movement of said roll brackets, a seam guide blade, means carried by and movable with said

yoke for supporting and vertically moving said blade, each of said roll bracket moving means, yoke moving means, and blade moving means including an operating member extending out on the same side of said base.

3. In apparatus of the class described, a base having a pair of wide tracks extending transversely thereof and a pair of narrow tracks extending parallel to and between said wide tracks, a pair of independently movable roll supporting brackets mounted on said narrow tracks, a yoke member encompassing said roll brackets and mounted on said wide tracks, means on said base for simultaneously moving said roll brackets toward or away from each other on said narrow tracks, means on said base for moving said yoke on said wide tracks, a pair of rolls carried on said roll brackets, and a seam guide member carried by said yoke.

4. In apparatus of the class described, a base having a pair of wide tracks extending transversely thereof and a pair of narrow tracks extending parallel to and between said wide tracks, a pair of independently movable roll-supporting brackets mounted on said narrow tracks, a yoke member encompassing said roll brackets and mounted on said wide tracks, means on said base for simultaneously moving said roll brackets toward or away from each other on said narrow tracks, means on said base for moving said yoke on said wide tracks, a pair of rolls carried on said roll brackets, and a seam guide member carried by said yoke and disposed between said rolls, said seam guide member being adjustable vertically and longitudinally on said yoke.

5. In apparatus of the class described, a base having a pair of wide tracks extending transversely thereof and a pair of narrow tracks extending parallel to and between said wide tracks, a pair of independently movable roll-supporting brackets mounted on said narrow tracks, a yoke member encompassing said roll brackets and mounted on said wide tracks, means on said base for simultaneously moving said roll brackets toward or away from each other on said narrow tracks, means on said base for moving said yoke on said wide tracks, a pair of rolls carried on said roll brackets, a seam guide member carried by said yoke, a support for said guide member mounted in vertical slides on said yoke, and means carried by said yoke and movable therewith for vertically moving said support in said slides.

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