Oct. 1, 1957 F. L. WIENEKE 2,807,861

REED SUPPORT FOR WARP HANDLING MACHINES

Filed April 24, 1956 4 Sheets-Sheet 1

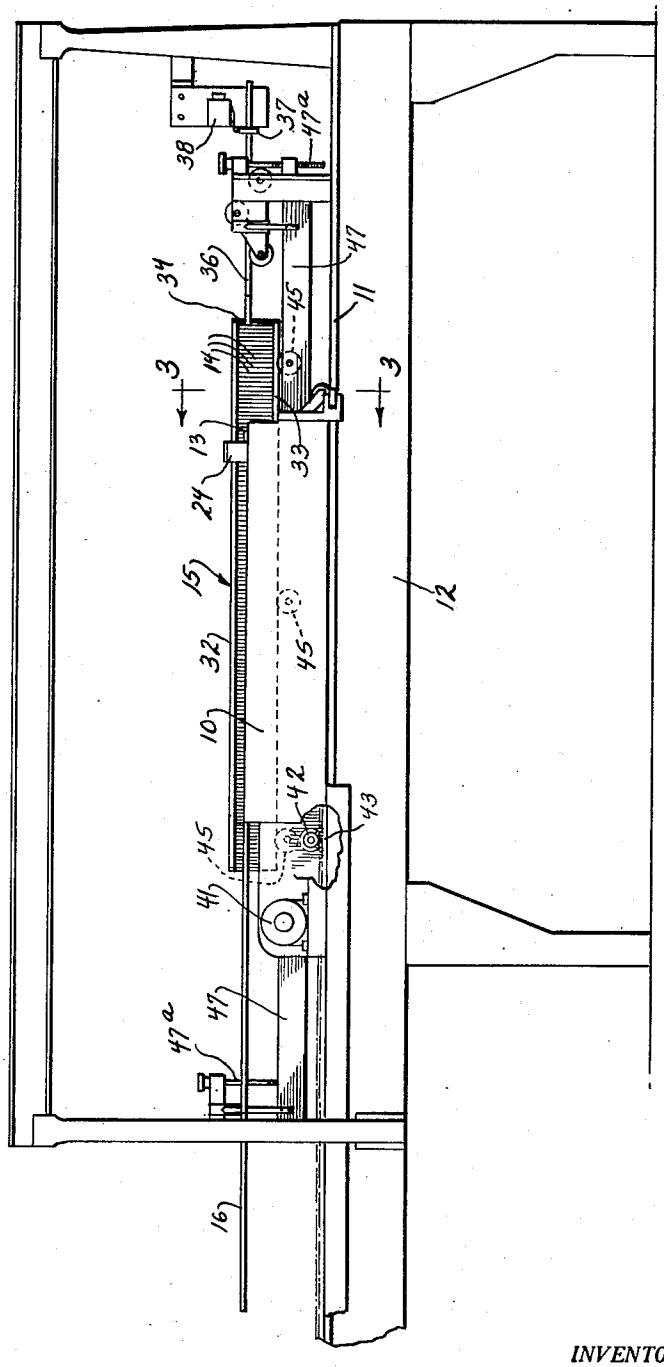


Fig. 1.

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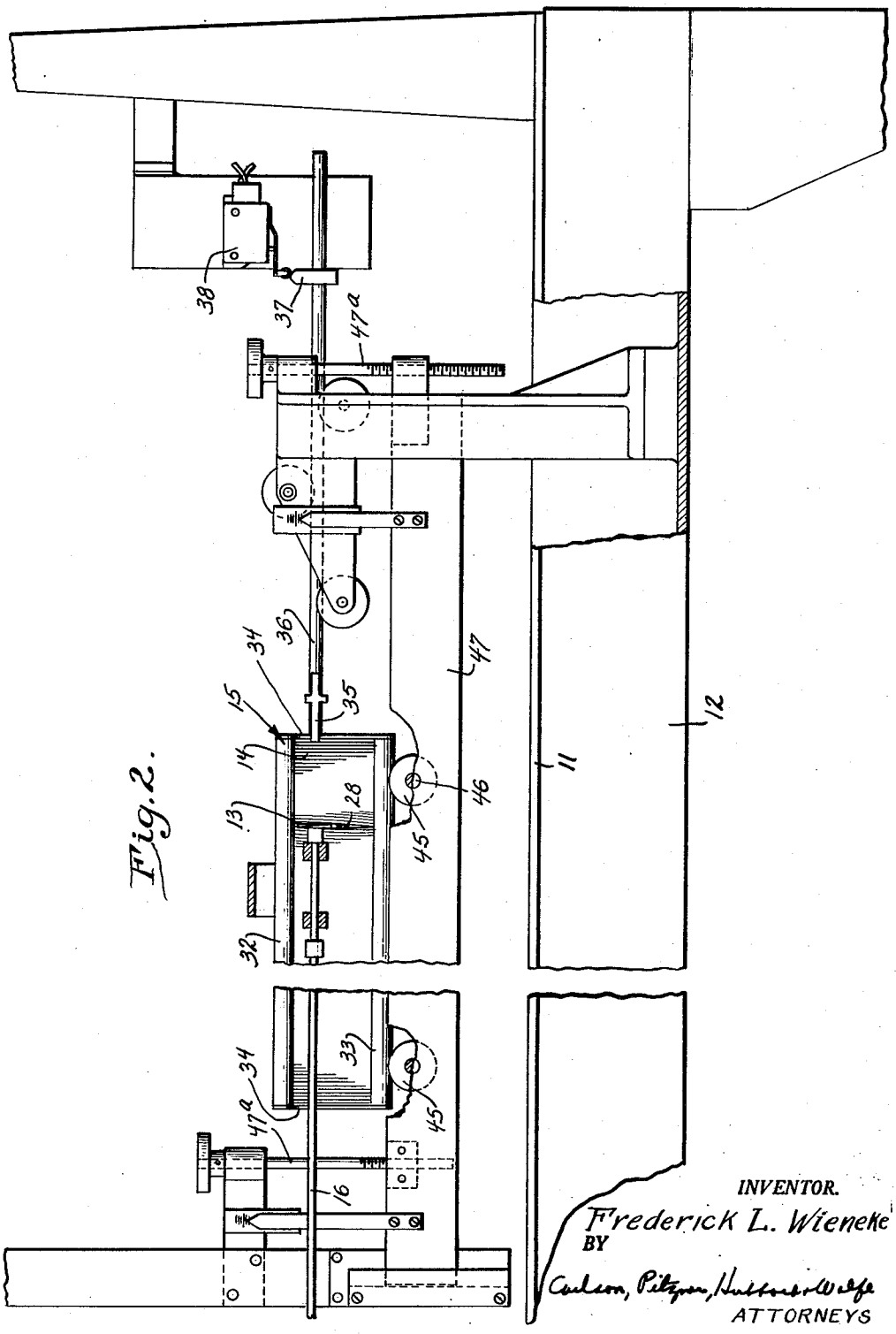


Fig. 2.

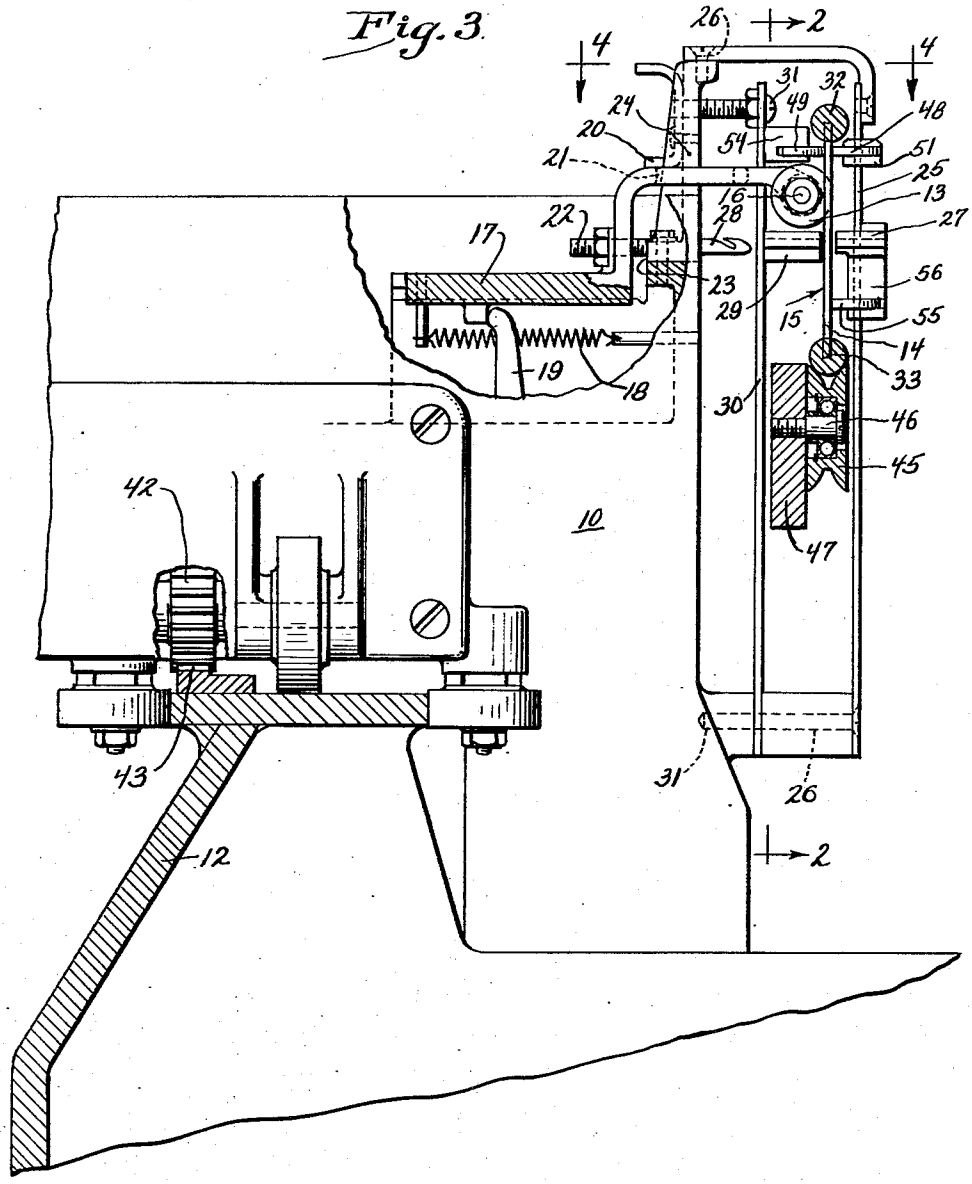
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Fig. 3.



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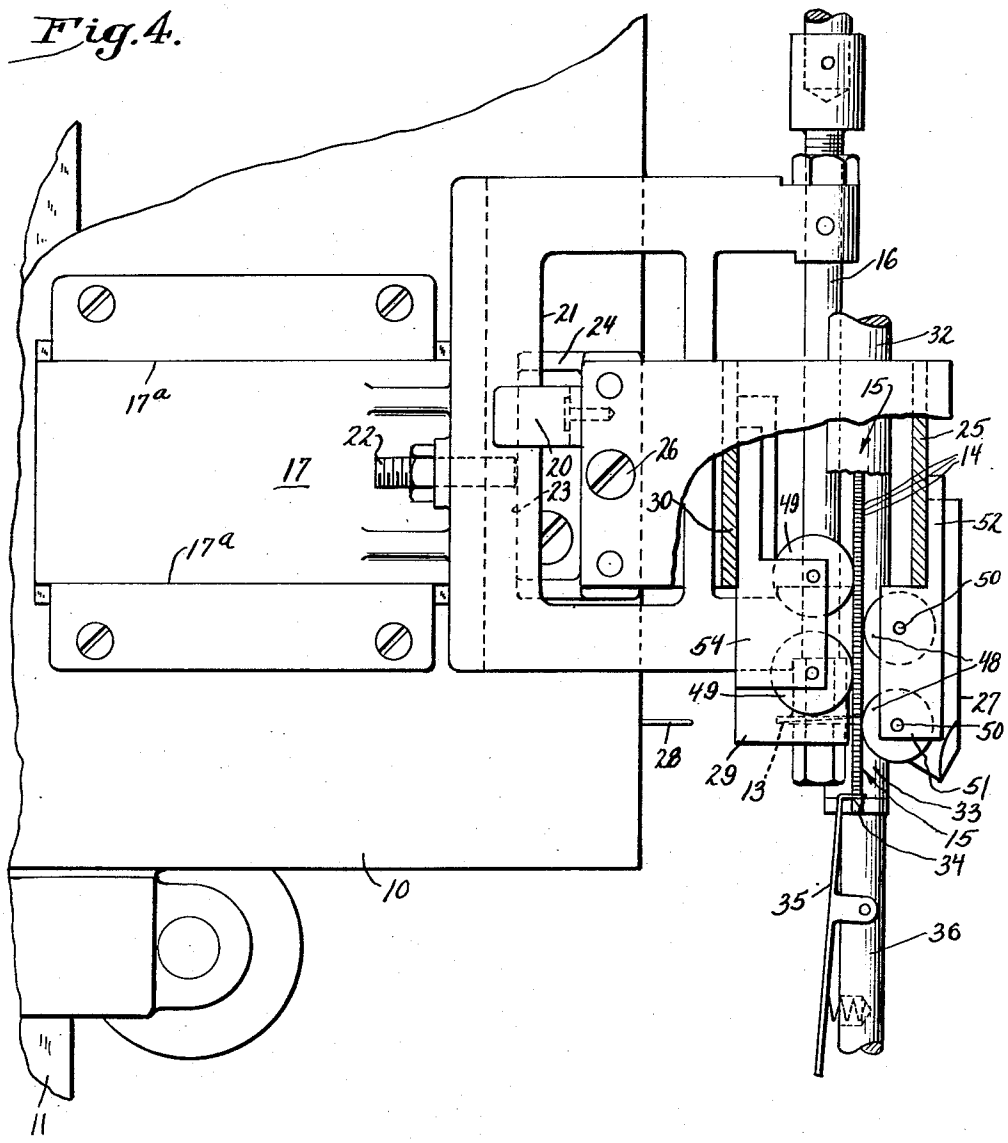
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Fig. 4.



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REED SUPPORT FOR WARP HANDLING MACHINES

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Application April 24, 1956, Serial No. 580,220

5 Claims. (Cl. 28—45)

This invention relates to machines for selecting warp threads one by one and drawing the same through the drop wires, heddle eyes and the dents of a reed for subsequent transfer to a loom. In such machines (see Patent 1,169,087), the reed is supported in upright position along the path of travel of a carriage which supports the reciprocating thread drawing needle and a so-called opener for separating the adjacent dents of the reed preparatory to projection of the needle therebetween. The present invention has more particular reference to the means for supporting the reed for limited endwise floating under the action of the reed opener.

The general object is to improve the floating mounting of the reed for the purpose of reducing the danger of scoring or roughing the surfaces of the dents by their rubbing engagement with the opener.

Another object is to substantially reduce the mass of reed support and its resistance to shifting in response to the action of the reed opener in separating the dents.

The invention also resides in the novel construction of the reed mounting to provide proper lateral support for the reed dents adjacent their point of engagement by the reed opener.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a fragmentary front elevational view of part of a warp drawing-in machine embodying the novel features of the present invention.

Fig. 2 is a fragmentary longitudinal sectional view taken substantially along the line 2—2 of Fig. 3.

Fig. 3 is a fragmentary section taken along the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary plan view broken away along the line 4—4 of Fig. 3.

The warp drawing-in machine partially shown in the drawings to illustrate the improved reed support is of the conventional type having a carriage **10** slidable along a guide **11** on a bed **12** and carrying a rotary opener **13** for separating the adjacent dents **14** of a reed **15** as the carriage moves along the latter. The opener is coupled to the end of an elongated drive shaft **16** (Fig. 4) and is journaled on a slide **17** guided in ways **17a** on the carriage and urged by a spring **18** toward the reed and to the normal operating position shown in Fig. 3. When the slide **17** is retracted by an arm **19**, a latch **20** engages behind a shoulder **21** to hold the slide and the opener from the reed. After removal and replacement of the latter, the latch is released allowing the slide to return to active position determined by engagement of an adjustable screw **22** with a stop **23** on a post **24** upstanding from the carriage **10**.

The upper end of the post projects up through an opening in the slide **17** to support the latch **20** and a vertical plate **25** secured by screws **26** to the carriage **10** and disposed adjacent and behind the reed. This plate supports

one of the guides **27** through which a needle **28** is advanced to pick up a thread and, in its return stroke draw the thread through a drop wire, heddle eyes and the separated dents of the reed. The other needle guide **29** is mounted on an upright plate **30** clamped by screws **31** to the slide **17** between the latter and the reed.

As in standard reed constructions, the flexible dents **14** of the reed are disposed side by side and are suitably joined at opposite ends to upper and lower bars **32** and **33** which are usually circular in cross section. At opposite ends, the bars are joined by rigid cross members **34** one of which is coupled as by a latch **35** (Fig. 4) to an abutting rod **36** projecting from one end of the reed and carrying a dog **37** for actuating a switch **38**. The latter controls the selective energization of an electric motor **41** (Fig. 1) mounted on the carriage **10** and geared to a pinion **42** meshing with a rack **43** on the machine bed. As the rotating reed opener **13** enters between the successive pairs of dents of the reed to separate the same, it exerts a cam action which urges the reed as a unit and the rod **36** endwise in one direction thus actuating the switch **38** to start the motor **41**. The carriage is thus moved a short distance corresponding to the lead of the disk-like opener, the switch then being opened to stop the motor. The latter thus operates intermittently to keep the carriage in step with the progress of the opener along the reed.

The present invention aims to substantially decrease the pressure of the rubbing engagement between the opener **13** and the reed dents **14** incident to the endwise shifting of the reed, thereby avoiding the objectionable marking of the dent surfaces that has occurred in prior constructions. This is accomplished by a novel mounting of the reed **15** that substantially reduces the mass of the parts required to be moved by the opener while at the same time providing adequate support for the reed dents adjacent the point of their engagement by the opener.

To these ends, the lower bar **33** of the reed rests in the grooves of rollers **45** spaced along the bar and journaled in antifriction bearings on studs **46** which project from an elongated bar **47** supported on the machine bed through screws **47a** by which the vertical position of the rollers may be adjusted. The entire weight of the reed is thus sustained by the rollers which permit of endwise shifting of the reed with minimum frictional resistance. At the same time, the lower bar of the reed is held positively against shifting sidewise.

Near the upper ends of the dents **14** the reed is supported laterally by virtue of its rolling contact on opposite sides with two pairs **48** and **49** of circular disklike rolls mounted on the carriage **10** to follow along the reed with the opener **13**. The rolls **48** which are disposed in front of the reed are journaled on pins **50** (Fig. 4) spanning spaced flanges **51** on a block **52** which is secured to the plate **25** above described. By adjusting the upper screws **31**, the peripheries of the rolls **49** may be brought into close proximity to the dents **14** immediately below the upper bar **32** of the reed. The top of the latter is thus supported laterally by the movable peripheries of the two pairs of rolls **48** and **49**.

The other two rolls **49** are staggered relative to the front rolls and are similarly journaled on pins **53** carried by a block **54** which is secured to the plate **30** in a position to dispose the periphery of the rolls close to the upper ends of the reed dents thus providing a rigid but nevertheless rollable backing for the dents at points disposed close to the needle guides **27** and **29** and the area of engagement of the dents by the opener **13**. Additional support for the dents on the front side of the reed is afforded by similar rollers **55** mounted on a block **56** rigid with the plate **25** below the guide **27**.

In the mounting above described, many of the parts heretofore used in supporting the movable reed unit have been omitted and the mass of the reed is reduced correspondingly. At the same time, the reed is supported laterally as well as vertically by surfaces which permit free rolling back and forth thus eliminating sliding friction. The reed is substantially more sensitive and more easily shifted endwise by the action of the opener **13** to actuate the control switch **38**. As a result of the reduction in the pressure required to be applied by the opener to the reed dents, the danger of marring or otherwise damaging the surfaces of the latter is virtually eliminated. By mounting the rolls **49** on the slide **17** along with the opener **13**, the upper guides for the reed are separated from each other as the slide is retracted thus permitting easy removal and replacement of the reed.

I claim as my invention:

1. In a warp drawing machine, the combination of, a reed having upper and lower rigid bars spanned by a multipilicity of dents, rollers lying in the plane of the reed and spaced along said lower bar for engagement with the underside of the bar, a pair of rolls freely rotatable about upright axes disposed on opposite sides of said reed with their peripheries lying against said dents on opposite sides of the reed and below said upper bar, said rollers and rolls coacting to support said bars for free endwise floating, a carriage supported adjacent said reed for movement along the latter, means on said carriage supporting said rolls for adjustment toward and away from opposite sides of said reed, a slide mounted on said carriage for movement away from and toward said reed, and a rotary opener on said slide engageable near said rolls with successive pairs of said dents to spread the latter apart.

2. In a warp drawing-in machine, the combination of, a carriage movable along a rectilinear path and supporting a power driven reed opener, a reed having upper and lower rigid bars spanned by a multiplicity of dents and positioned for engagement with and separation by said opener at a point disposed between said bars, rollers lying in the plane of the reed and spaced along said lower bar for engagement with the underside of the bar and for free rotation about fixed axes extending transversely of said reed, and a pair of rolls freely rotatable about upright axes disposed on opposite sides of said reed with their peripheries lying adjacent opposite sides of said reed for engagement with the dents thereof near said opener.

3. In a warp drawing machine, the combination of, a reed having upper and lower rigid bars spanned by a multiplicity of dents, rollers lying in the plane of the reed and spaced along said lower bar for engagement with the underside of the bar, a pair of rolls freely rotatable about upright axes disposed on opposite sides of said reed with their peripheries lying against said dents on opposite sides of the reed and below said upper bar, said rollers and rolls coacting to support said bars for free endwise floating, a carriage supported adjacent said reed for movement along the latter, means on said carriage supporting said rolls for movement away from and toward each other, and a rotary opener on said carriage engageable with successive pairs of said dents to spread the latter apart.

4. In a warp drawing-in machine, the combination of, a carriage movable along a rectilinear path and supporting a power driven reed opener, a reed having upper and lower rigid bars spanned by a multiplicity of dents and positioned for engagement with and separation by said opener at a point disposed between said bars, rollers lying in the plane of the reed and spaced along said lower bar for engagement with the underside thereof, means supporting said rollers for free rotation about fixed axes extending transversely of said reed, and a pair of rolls mounted on said carriage to rotate about upright axes disposed on opposite sides of said reed with their peripheries lying adjacent opposite sides of said reed for engagement with the dents thereof.

5. In a warp drawing machine, the combination of, a reed having upper and lower bars spanned by a multiplicity of dents, a carriage disposed adjacent said reed for movement longitudinally of the latter, grooved rollers lying in the plane of the reed and spaced along said lower bar in engagement with the underside thereof, means supporting said rollers for free rotation about fixed axes extending transversely of said reed, and a pair of rolls rotatably mounted on said carriage and engageable with opposite sides of said dents, said rollers and rolls coacting to support said bars for free endwise floating.

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