Oct. 12, 1926. 1,603,226

S. C. WENTZ

PAPER MAKING MACHINE

Filed Dec. 1, 1925 3 Sheets-Sheet 1

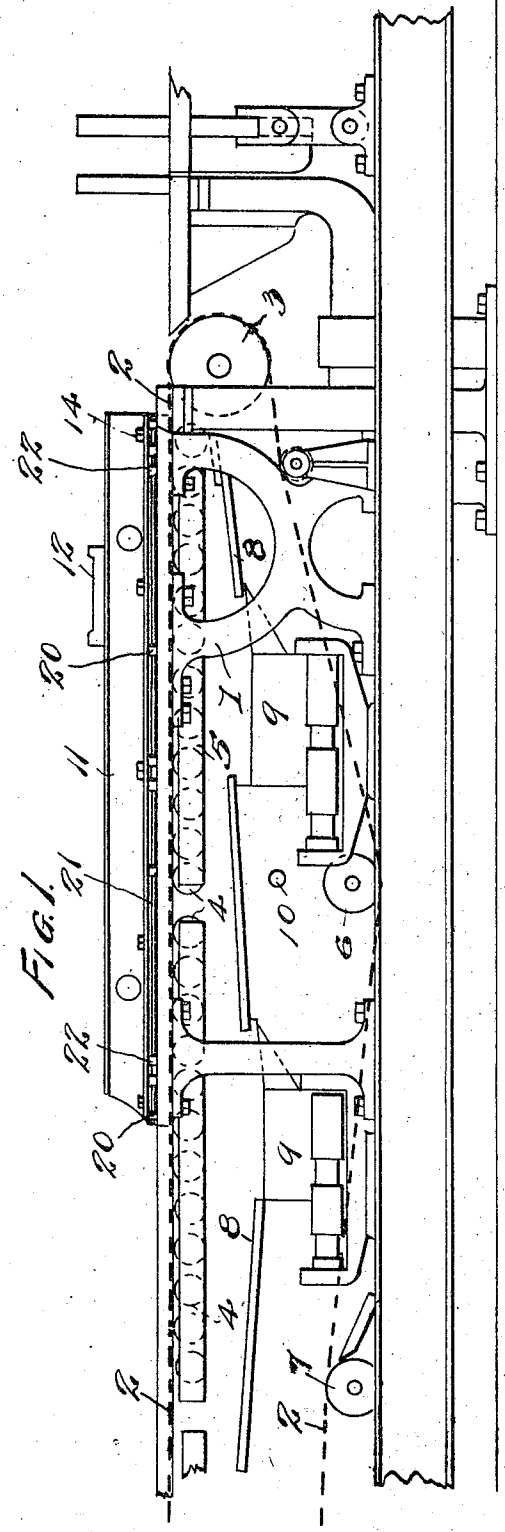


Fig. 1.

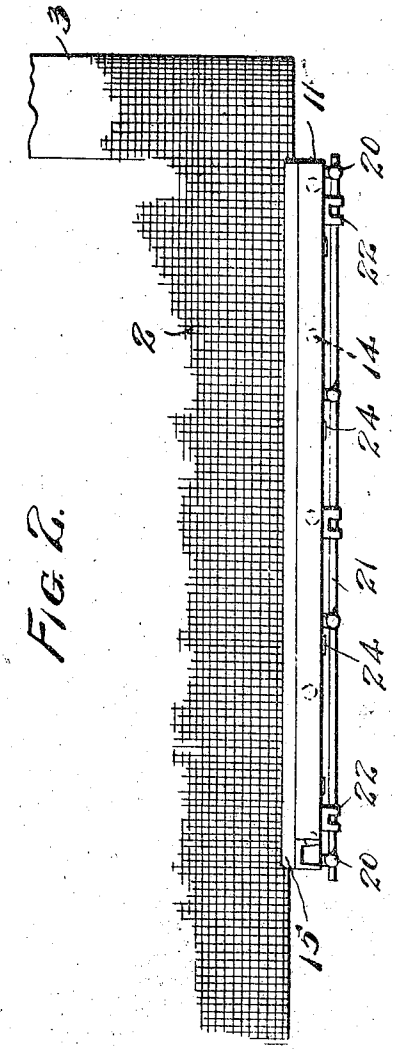


Fig. 2.

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PAPER MAKING MACHINE

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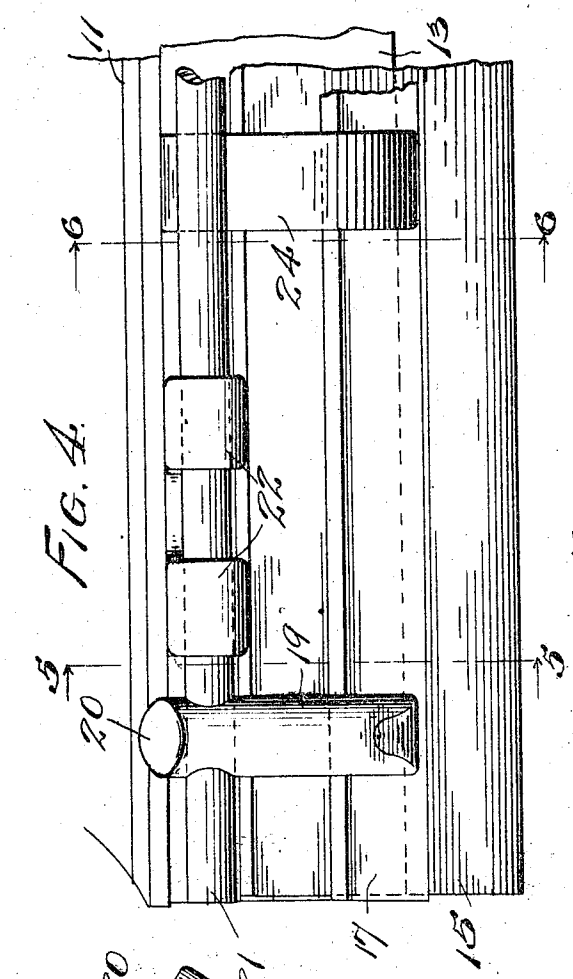


FIG. 4.

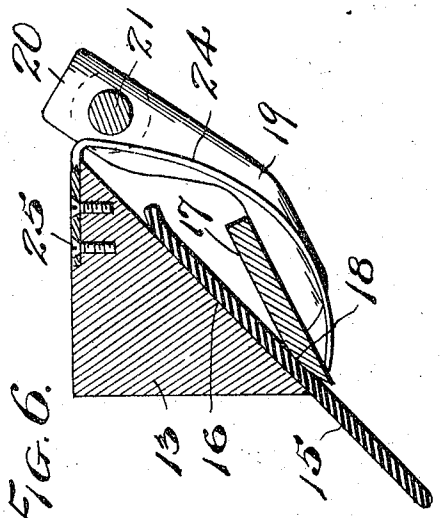


FIG. 6.

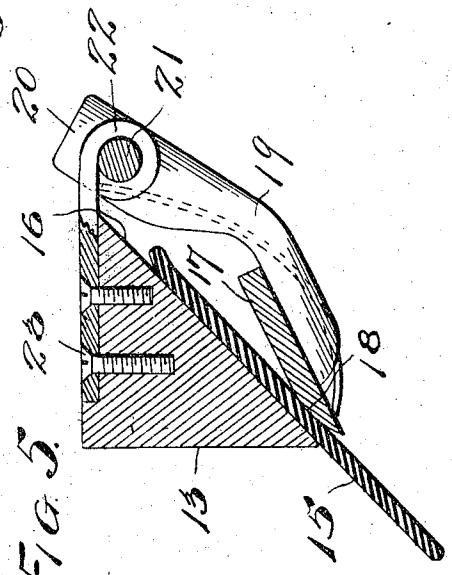


FIG. 5.

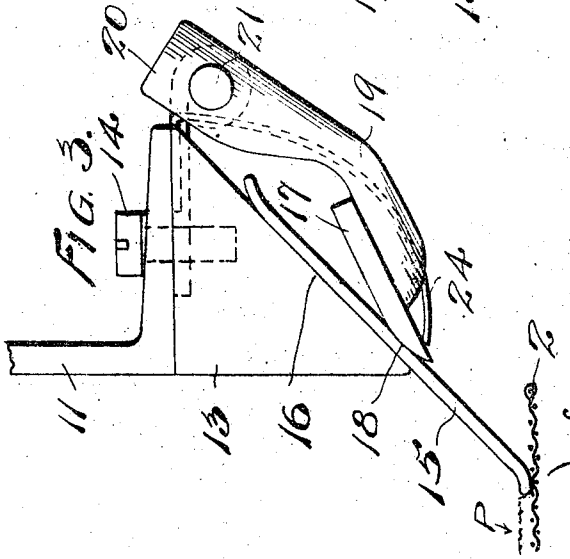


FIG. 3.

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PAPER MAKING MACHINE

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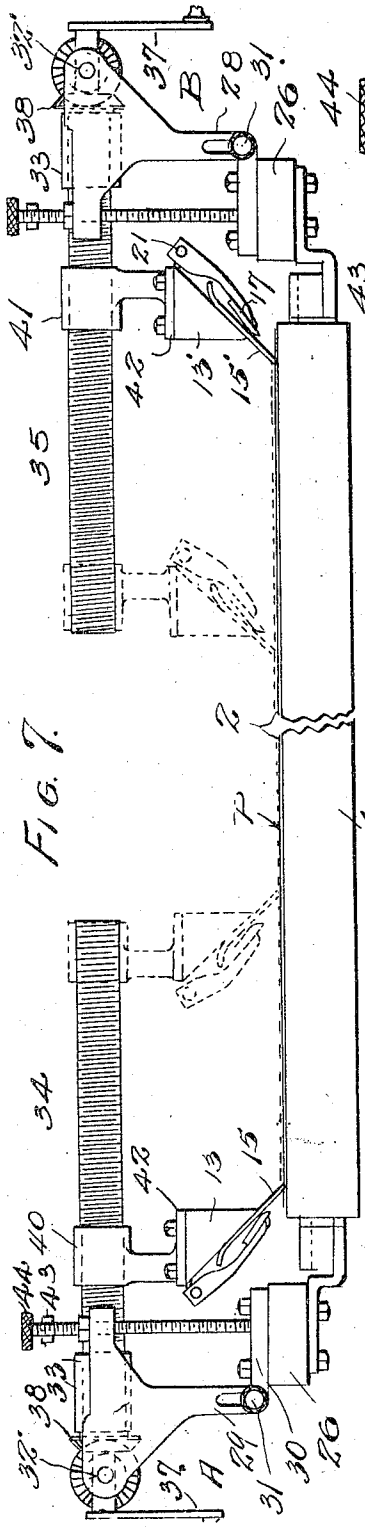


FIG. 7.

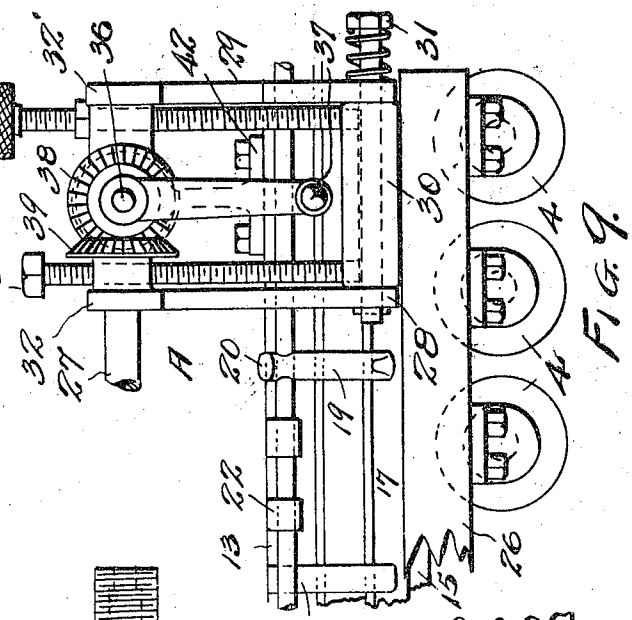


FIG. 9.

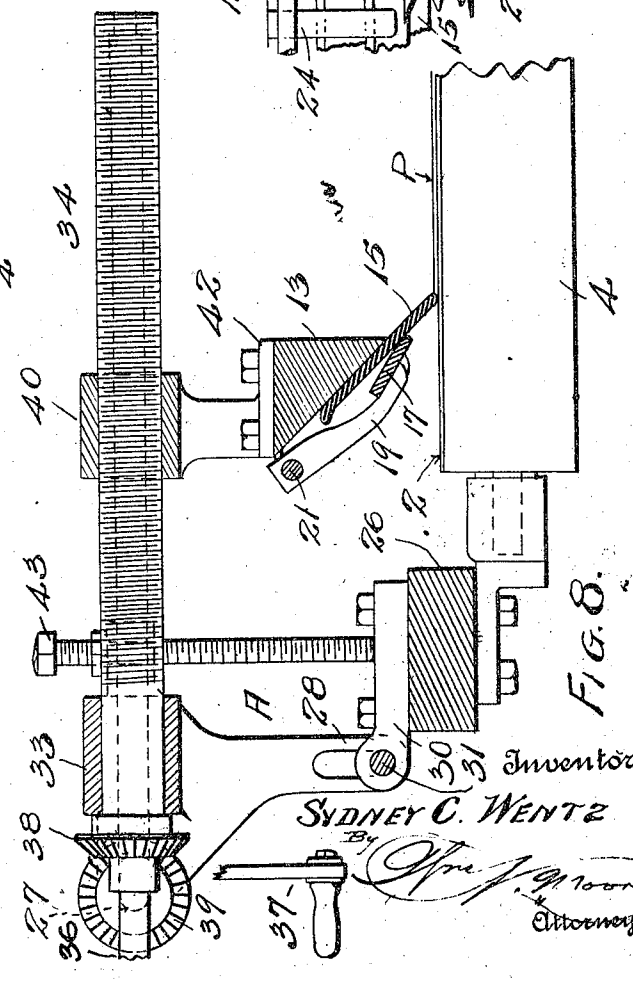


FIG. 8.

Inventor
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Patented Oct. 12, 1926. 1,603,226

UNITED STATES PATENT OFFICE.

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PAPER-MAKING MACHINE.

Application filed December 1, 1925. Serial No. 72,561.

My present invention relates to improvements in paper machines and particularly to the Fourdrinier type of paper making machines which have a substantially horizontal endless travelling screen or apron (called the wire) on one end of which the pulp is deposited for the formation of a layer or web, and from the other end of which wire the web is continuously removed and carried away.

At the lateral edges of the web it is customary to utilize endless deckle belts or edge belts which rest on the wire for the purpose of preventing the pulp from dropping over the edges of the wire and for the formation of the deckle edges of the web.

These belts are each supported on pulleys journaled above the wire in a deckle frame, and both the wire and the belts are subjected to wear resulting in constant repair and replacement of parts at a considerable expense.

The primary object of my invention is the provision of an attachment for this type of machines (which is also applicable for use with various other types of machines) whereby the wear on the wire is diminished and the wire thus rendered more durable; and a stationary but adjustable edge-ruler or guide is substituted for the endless travelling edge belts, which guide-ruler, when worn may be readjusted, repaired, or replaced at comparatively low cost of material and labor without loss of valuable time due to an idle machine.

The invention consists essentially in combining with the usual deckle frame or other part of the machine, a stationary, flexible, elastic and adjustable edge-ruler or guide at each edge of the wire and adapted to lightly contact with the upper face of the wire to prevent excessive lateral movement of the pulp and to form the deckle edge of the web, together with certain novel features of construction and arrangement of parts as will hereinafter be more fully set forth and claimed.

In the accompanying drawings I have illustrated the complete examples of the physical embodiment of my invention wherein the parts are combined and arranged in accordance with the best modes I have thus far devised for the practical application of the principles of my invention.

Figure 1 is a view in side elevation of so much of a paper making machine as is necessary to illustrate the application thereto of the device of my invention.

Figure 2 is a plan view of a portion of the wire cloth or apron, known in the trade as the wire, showing the relation thereto of the deckle guide of my invention.

Figure 3 is an enlarged view at the end of one of the guides.

Figure 4 is an exterior face view at one end of a guide.

Figure 5 is a sectional view at line 5—5 of Figure 4.

Figure 6 is a sectional view at line 6—6 of Figure 4.

Figure 7 is an end view illustrating a vertically and laterally adjustable arrangement of the deckling device and showing in dotted lines the adjustment for a minimum width of pulp or sheet on the wire.

Figure 8 is an enlarged detail sectional view at the left side in Fig. 7.

Figure 9 is a side view of a portion of the adjusting mechanism.

In carrying out my invention machines now in use may readily be converted for the purpose by removing the usual endless deckle belt or guide belt and its supports and substituting the devices of my invention, which are attached to the deckle frame now in use, and of course I contemplate utilizing the device of my invention as part of the equipment of new machines.

In order that the general arrangement and relation of parts may readily be understood I have shown in Figures 1 and 2 a well known type of paper making machine from which the usual endless belts or deckle guides have been removed and replaced by the devices of my invention. This machine is of the Fourdrinier type having the usual supporting frame 1 and endless screen 2 made up of wire cloth in the form of an apron and hereinafter referred to as the wire, which passes over the breast roll 3 and brass table rolls 4 which extend transversely of the machine beneath the working flight of the wire. The bearing or supporting bars 5 are indicated in Figure 1 for the table rolls, and the usual bottom guide rolls 6 and 7 are shown in this figure of the drawings, together with the drain tables 8, receptacles 9, and shower 10. The deckle frame which is supported above the machine directly over a part of the wire comprises a pair of longitu-

dinally extending channel beams 11 which are joined by a transverse brace as 12, and other necessary accessories to form the complete frame.

In equipping the paper making machine with my invention, I utilize a pair of deckle bars as 13, one at each side of the wire and attached beneath the channel bars 11 of the deckle frame by means of screws or bolts 14. As here shown, the deckle bars are of triangular shape in cross section and fashioned from wood, but it will be understood that any other suitable material and shape may be adopted for the deckle bars which are of the required length and secured beneath the channel bars of the frame as shown, to form a rigid part thereof.

Each deckle bar is provided with an edge guide or ruler as 15 fashioned from a strip of flexible, resilient and elastic material, which is here indicated as rubber, but other material may be used when suited for the purpose. The deckle bar is fashioned with a bearing face 16 which extends longitudinally of the bar and is inclined at an angle to the perpendicular inner face of the deckle bar and by means of a retaining bar 17 the edge guide or ruler 15 is held against the smooth flat bearing face with its lower edge in position to project over the edge of the wire 2 as indicated in Figure 3, for the purpose of guiding the pulp as it is formed into a web and preventing the pulp from dropping over the edge of the wire.

The retaining bar 17 is disposed at an angle to the guide-ruler and is preferably fashioned with a smooth rounded bearing face 18 that impinges against the flexible guide ruler to hold it in place. The guide-ruler is thus held by friction and its lower end rests lightly on the top surface of the wire 2. The edge ruler may with facility be accurately adjusted to position by first withdrawing the retaining bar and then moving the strip or edge-ruler 15 to its proper position. The edge ruler may subsequently be adjusted to compensate for wear thereon and it will be apparent that the strip may be slipped down its inclined bearing face 16 substantially the distance of the width of the strip above the bearing point 18 of the retaining bar, thus prolonging the life and durability of the edge ruler and economizing in use of material. The adjustment when required may readily be made and requires a minimum of time and labor.

The retaining bar 17 is suspended parallel with the deckle bar at the outer side of the latter, by means of hangers 19 rigid with the bar, and the hangers are provided with perforated heads 20 through which the hinge rod 21 is passed and secured to the heads. The retaining bar and hangers, together with the hinge rod 21, thus form a rigid retaining frame for the guide-ruler and resilient means are utilized to hold the retaining bar 17 against the guide ruler. For this purpose I employ hinges 22 located at suitable intervals along the deckle bar and secured thereto by means of screws 23. The hinges are preferably located in mortises in the upper face of the deckle bar to insure a smooth face for contact with the lower face of the channel beam 11 of the deckle frame, and the hinge rod 21 is preferably rigid with the hangers 19 and loose in the hinges.

A suitable number of flat resilient plates or leaf springs 24 are used for resiliently holding the retaining bar 17 against the guide ruler. These springs are also countersunk in the upper face of the deckle bar and secured therein by screws 25, with the curved metal plates located between the hinge rod 21 and the retaining bar, and with the lower ends of the springs bearing against the outer face of the retaining bar.

This construction it will be noted insures the retaining of the strip or edge ruler in place but allows a manual sliding movement of the ruler in its mounting to adjust it as it wears as well as to obtain the nicest possible adjustment without taking the ruler from its support.

In Figures 7, 8 and 9 I have shown the decking device supported from the side rails 26 of the paper making machine and equipped the device with means for laterally adjusting the two deckle guides or rulers 15 toward and from each other to adjust the rulers to a minimum or a maximum width of the sheet or pulp indicated as P. The deckling device is also sectionally adjustable with relation to the wire 2. For this purpose I employ a deckling frame comprising one or more units, depending upon the length of the deckle desired and supported on and above the two side rails 26. Each unit comprises a pair of longitudinally extending parallel shafts 27, one at each side of the machine, and these shafts are journalled at their ends in duplicate bearing frames, one of which is indicated at the left side in Fig. 7 as a whole by the letter A and a complimentary bearing frame B is indicated at the right in Fig. 7. Two bearing frames A are connected by a shaft 27 and two bearing frames B at the other side of the machine are connected by a similar shaft 28. As the construction and operation of each of the four bearing frames included in a unit are the same, a description of one device will suffice for all of them.

Each bearing frame is provided with two slotted, vertical arms 28 and 29 supported from a base plate 30 by means of a spring passed bolt 31 passed through the plate and the latter is bolted securely on the upper face of the side rail 26.

These slotted plates have triangular upper portions with bearings 32 for the end

of one shaft 27 and bearing 32' for the end of another shaft which latter bearing is used when a second unit is employed.

The two arms are fashioned with an integral bearing boss 33 between them, the bore of which boss extends transversely of the machine and is used to support a screw bar as 34 or 35. This screw bar preferably is a cylindrical tube journalled in the bearing boss 33, provided with exterior threads, and the pair of screw bars 34 and 35 are axially alined and project toward each other above the wire 2.

A shaft 36 is secured in each tubular screw bar and a crank handle 37 is fixed at its end where it is accessible for use by an attendant of the machine. Shaft 36 has a bevel gear 38 thereon that meshes with a complementary gear 39 on shaft 27 and by turning the crank handle it will be apparent that a screw bar 34 in a pair of bearing frames as A may simultaneously be turned.

On each screw bar 34—35 is a travelling nut as 40 and 41 and each nut has an attaching flange 42 bolted on top of the deckle bars 13 and 13'. As seen in Figures 7 and 8 a pair of screw bars 34 and a pair of screw bars 35 may be revolved when their respective crank handles 37 are turned for the purpose of moving or adjusting the deckle guides 15 and 15', laterally of the wire and relatively to one another. The range of lateral adjustment of the deckle guides is indicated between the full line positions and the dotted line positions in Figure 7.

The deckling device is also adjustable vertically with relation to the wire 2.

For this adjustment I use a pair of vertically disposed bolts 43 and 44 for each bearing frame A and B. These bolts are threaded through holes in the plates 28 and 29 of the bearing frames and at their lower ends rest upon the upper faces of the base plates 30. By turning the bolts the bearing frames A and B may be elevated or lowered with relation to the side rails 26 and consequently the deckle guides 13 and 13' are adjusted relatively to the top surface of the wire 2 with which they contact for the purpose of forming and guiding the deckle edge of the sheet or pulp P.

From the above description taken in connection with my drawings it will be apparent that the device of my invention is quite simple in construction, as it comprises a minimum number of parts that may readily be assembled, and as an attachment it may quickly be secured in operative position for use. A maximum wear may be secured from the flexible edge-rulers, and when worn they may with facility be re-adjusted, and finally replaced as required by new strips. The wear on the wire is negligible because of the light contact therewith of the flexible, elastic guide-ruler, and therefore the durability of the wire is enhanced thus reducing the cost of maintenance of the machine, and the guide-ruler performs its functions with accuracy and efficiency.

It will be noted that my improvement dispenses entirely with the present construction of deckle straps and becomes a part of the machine, being mounted upon or in proper relation to the pair of rails at one end of the machine, thus forming an actual or integral part of the machine.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a paper making machine, the combination with the pair of parallel longitudinal rails at one end of the machine and the wire below said rails and spaced a short distance therefrom, of a pair of members arranged intermediate of the rails and wire, a pair of elastic strips carried by said members and having their edges bearing upon said wire and slidable in said members.

2. In a paper making machine, the combination with the pair of longitudinal rails at one end of the machine, and the wire below said rails and spaced therefrom, of a pair of members arranged intermediate of the rails and wire, a pair of elastic strips carried by said members and having their edges bearing upon said wire, said elastic strips being adjustably and yieldingly supported from said pair of members.

3. In a paper making machine, the combination with a deckle frame and wire of a deckle bar attached to said frame, a longitudinally disposed edge-guide, and resilient means for supporting said guide on said bar.

4. In a paper making machine, the combination with a deckle frame and wire, of a deckle bar attached to said frame, a longitudinally disposed elastic edge guide, and resilient means for supporting said guide on said bar.

5. In a paper making machine the combination with a deckle bar, of a flexible adjustable strip, and spring pressed means for retaining said strip on said bar.

6. In a paper making machine the combination with a deckle bar, of an elastic strip, and resilient means carried by said bar for retaining said strip in operative position.

7. The combination with a deckle bar, of a hinged retaining bar, a rubber edge-guide strip, and springs carried by said deckle bar for retaining the strip between said bars.

8. In a paper making machine, the combination with the pair of frame members and the wire below said members, of a pair of slidable paper guides arranged between the frame members and wire.

9. In a paper making machine, the com-

bination with the pair of frame members and the wire below said members of a pair of paper guides arranged between the wire and frame members and having a yielding and slidable movement.

10. In a paper making machine, the combination with the pair of frame members and the wire below said members, of supports mounted on the frame members, and paper guides carried by said supports and having a slidable, adjustable and elastic action.

11. In a paper making machine, the combination with the wire, of a pair of supports and paper guides having their upper portions slidably mounted in said supports to permit removal and adjustment of the lower portion of the guides with reference to the wire.

12. In a paper making machine, the combination with the wire, of a pair of supports and paper guides having their upper portions slidably and elastically mounted in said supports to permit removal and adjustment of the lower portion of the guides with reference to the wire.

13. In a paper making machine, the combination with the wire, of a pair of supports, paper guides slidably mounted in said supports, and means for adjusting said supports vertically and laterally with reference to the wire.

14. In a paper making machine, the combination with the wire, of a pair of supports, paper guides slidably and elastically mounted in said supports and having vertical and lateral adjustment with reference to the wire.

In testimony whereof I hereunto affix my signature.

SYDNEY CARROLL WENTZ.