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METHOD AND MEANS FOR WEAVING FOURDRINIER WIRES

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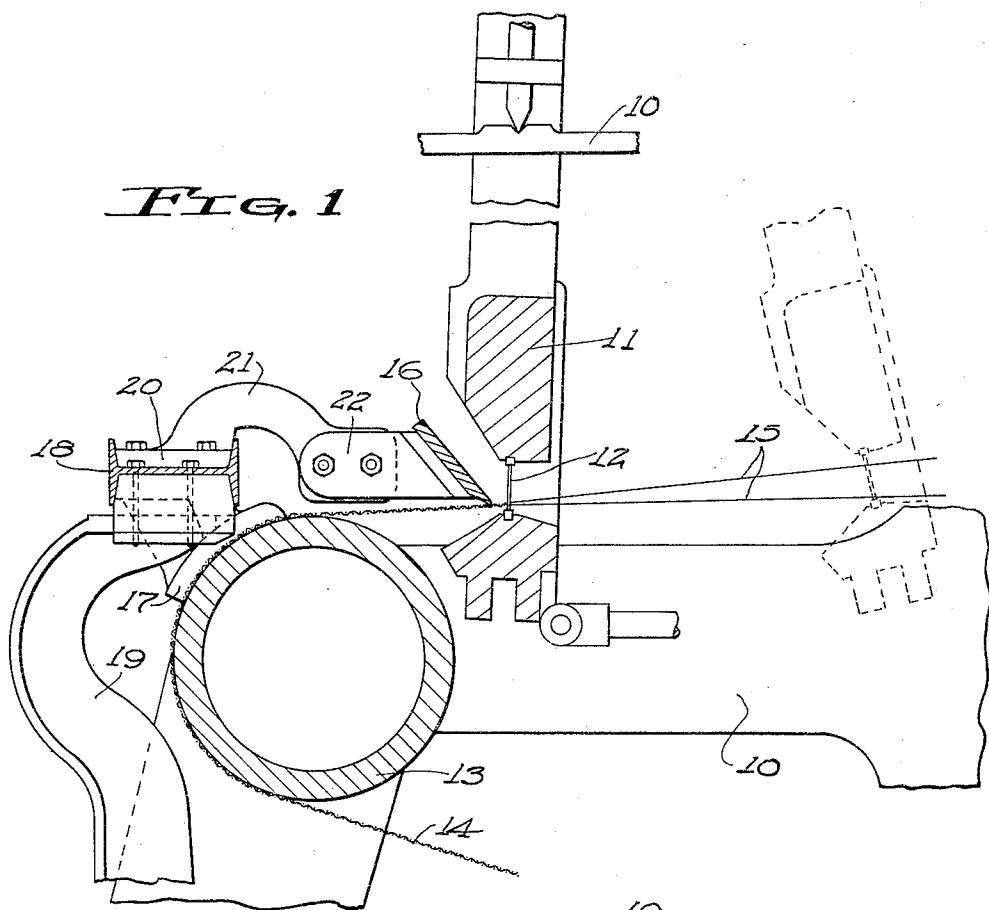


FIG. 1

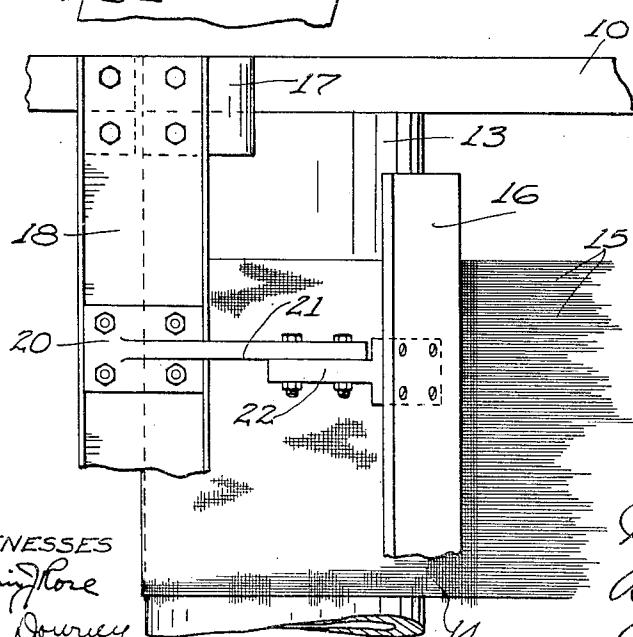


FIG. 2

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METHOD AND MEANS FOR WEAVING FOURDRINIER WIRES

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It is well recognized that the wire cloth forming the endless belt, or Fourdrinier wire, used on the Fourdrinier type of paper-making machine must be perfectly flat to insure 5 uniform thickness of the paper sheet formed on the cloth. The wire cloth is also required to have different meshes and drainage characteristics to suit the particular paper which is to be made and the surface finish which is 10 desired. By adhering to certain specifications in the temper, gage and spacing of the warp and weft wires and by exercising great care in the weaving operation and in the maintenance of the wire-weaving loom, it has 15 heretofore been possible to secure the desirable flat surface of the wire cloth within a limited range of meshes and wire gages, but these have been found insufficient to satisfy 20 the widely varying specifications of wire cloth now being demanded.

It is an object of the present invention to remove these limitations in the manufacture of Fourdrinier wires, and to provide a means for weaving wire cloth by which a smooth flat 25 cloth surface can be obtained to meet the widely varying conditions encountered in paper-making practice.

A more specific object of the invention is to provide straightening means pressing against 30 the upper surface of the newly woven portions of the wire cloth during the weaving operation to insure the production of smooth flat cloth.

A further object of the invention is to provide a method of weaving wire cloth in which the newly woven cloth is restrained against 35 vibration incident to the lateral component of force exerted thereon by the blow of the reed during the weaving operation, this component of force being resisted by an opposite 40 force and the newly woven cloth being simultaneously straightened to insure a smooth flat surface.

The invention further consists in the several features hereinafter set forth and more

particularly defined by the annexed claims.

In the accompanying drawing, Fig. 1 is a detail sectional elevation of a portion of a wire-weaving loom embodying the invention, and

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Fig. 2 is a fragmentary top plan view thereof.

In this drawing, the numeral 10 indicates the frame of a wire-weaving loom on the upper portions of which is suspended a swinging lay 11 provided with the usual reed 12. The side members of the frame 10 are connected at their forward portions by the usual breast beam 13 over which the finished wire cloth 14 passes on its way to the cloth beam (not shown). Warp wires 15 extend from a warp beam (not shown) and pass between the dents of the reed, as usual, to the finished wire cloth 14 of which they become a part. In Fig. 1, the lay is shown in full lines at its forward position engaging the face of the work, and the retracted position of the lay is indicated by dotted lines. The general construction of the loom is exemplified in United States Patent No. 1,391, 60

435, issued September 20, 1921, to Albert B. Weissenborn.

In a loom of the general type shown in this patent, the swinging lay operates as usual to beat up the weft wire left by the shuttle in its travel through the shed formed between the warp wires by the alternate reciprocation of the heddles. In the loom illustrated, the lay has an upward component, 70

component of motion when it approaches the fell. At the moment the reed strikes the newly laid weft wire, a lateral component of force is present displacing the newly woven cloth upwardly and causing it to vibrate. Under normal weaving conditions, 75

the wire cloth remains flat because the gage, temper and spacing of the warp and weft wires are suitably selected. However, when any departure is made from specifications known to be favorable to the production of flat cloth, it is found that ridges or waves 85

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appear in the newly woven cloth, caused in some measure by unequal displacement of the warp wires from the plane of the cloth.

In order to overcome this difficulty and to 5 permit the weaving of flat wire cloth of widely varying specifications, the present invention contemplates the provision of means engaging the upper surface of the wire cloth adjacent the face of the work to prevent any 10 vibration of the newly woven cloth and to hold the cloth perfectly flat at the moment the reed strikes the work. In the present instance, such means consists of a suitably supported flat bar 16 which extends completely 15 across the newly woven cloth in parallel adjacent relation to the face of the work and has a straight lower edge bearing against the upper surface of the cloth. Brackets 17 are mounted at the opposite ends 20 of the breast beam 13 and support thereon a channel beam 18 extending above the breast beam in spaced parallel relation thereto. In the case of a wide loom, the channel beam 18 may be supported at intermediate portions 25 by one or more standards 19. Brackets 20 are secured to the channel 18 and are provided with arms 21 extending toward the face of the work. Brackets 22 are adjustably clamped to the arms 21 and are provided 30 with inclined flanged portions to which the bar 16 is secured at an angle to the surface of the cloth in order that the weaver may view the newly formed edge of the cloth. In the present instance, the lower edge of the 35 bar 16 is shown to be rounded in cross-section, but this contour may be varied. The bar bears down on the cloth with sufficient pressure to insure the engagement of the cloth therewith at all points, but ordinarily 40 this pressure need not be very heavy.

In operation, when the lay falls, bringing the reed forcibly against the newly laid weft wire, the upward component of force on the edge of the cloth is communicated to, and resisted by, the stationary bar 16 which prevents vibration or displacement of the cloth. The bar maintains the newly formed edge of the wire cloth perfectly flat and functions much the same as an anvil in resisting the 45 upward force on the cloth.

By means of the invention, it is possible to successfully weave flat wire cloth of widely varying specifications as to mesh and wire gage to suit the requirements of paper mills. 50 In particular, it is frequently desirable to use harder or heavier weft wires than is customary in order to produce a stronger and more durable cloth, which will have a longer service life and which can be more easily handled by paper mill operatives without danger of damage. The cloth-engaging bar can be applied to various types of wire-weaving looms and does not require modification of the lay or other parts of the loom. 55

What I claim as new and desire to secure by Letters Patent is:

1. In a loom, the combination of a frame for supporting thereon warp wires and woven wire cloth, a lay swingably mounted on the frame for beating up weft wires into the face of the work, and a bar extending transversely above the cloth in spaced parallel relation to the face of the work and having a straight lower edge engageable with the upper side of the cloth completely across the cloth for maintaining the newly woven cloth flat during the beating up of the weft wires. 70

2. In a loom, the combination of a frame for supporting thereon warp wires and woven wire cloth, said frame including a breast beam over which the cloth passes, a lay for beating up weft wires into the face of the work, and a pressure-exerting member having a leveling surface engageable with the upper side of the wire cloth completely across the cloth between the face of the work and said breast beam. 80

3. In a wire weaving loom, the combination of a frame for supporting thereon warp wires and woven wire cloth, a lay swingably mounted on the frame for beating up weft wires into the face of the work, and a stationary bar having a straight edge extending completely across the wire cloth in engagement with one side thereof adjacent the face of the work for maintaining the cloth in leveled condition during the operation of the lay and thereby producing a flat wire cloth. 90

4. In a loom, the combination of a frame for supporting thereon warp wires and woven wire cloth, a lay swingably mounted on the frame for beating up weft wires into the face of the work and producing an upward component of force on the cloth at the moment the blow is struck, and a support having a straight surface engageable with the upper side of the cloth adjacent the face of the work and across the full width of the cloth for receiving and resisting said upward component of force and for insuring a flat surface for the newly woven cloth. 100

5. In a loom, the combination of a frame for supporting thereon warp wires and woven wire cloth, a lay swingably mounted on the frame for beating up weft wires into the face of the work and producing a lateral component of force on the cloth at the moment the blow is struck, and a support having a straight surface engageable with one side of the cloth adjacent the face of the work and completely across the cloth for receiving and resisting said lateral component of force and for insuring a flat surface for the newly woven cloth. 110

6. In a loom, the combination of a frame for supporting thereon warp wires and woven wire cloth, a lay swingably mounted on the frame for beating up weft wires into 120

the face of the work and producing a lateral component of force on the cloth at the moment the blow is struck, and a support having a straight surface engaging one side of the cloth adjacent the face of the work for receiving and resisting said lateral component of force and for insuring a flat surface for the newly woven cloth, said support and the pivotal axis of said lay being located on the same side of the fell.

In testimony whereof, I affix my signature.
WILLIAM EUGENE BUCHANAN.

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